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REPRODUCED AT THE NATIONAL ARCHIVES

NATIONAL FIREWORKS, INC.
West Hanover, Massachusetts

Interested Services:

Navy - Bureau of Ordnance
Bureau of Supplies and Accounts

Army - Chemical Warfare Service
Ordnance

THOMAS H. CARROLL
Lieut. Comdr., SC, USNR
30 September 1943

RG 46, Truman Committee
OP-46, Entry 60, Box 882
F "National Fireworks Co."

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NATIONAL FIREWORKS, INC.
West Hanover, Massachusetts

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NATIONAL FIREWORKS, INC.
West Hanover, Massachusetts

I. General History and Nature of Business

The company is an outgrowth of a business organized in 1900 by Mr. George J. J. Clark who has been the active executive head and principal stockholder.

The business was incorporated under the laws of Massachusetts on 22 December 1923. At the outset common stock was issued to a par value of $100,000 and preferred stock was issued to a similar extent, both for the net assets of an Arizona corporation bearing a similar name. In 1926 additional preferred stock was issued making the new total $200,000. In November 1940 new common was issued in exchange for the old common and the new par value of the issued common was $500,000; in 1941 a stock dividend of 60,000 shares was declared which increased the outstanding common stock to $800,000. Control was held by the Clark interests.

Early in 1943 the company repurchased for cash approximately 56% of the common stock at an approximate cash cost of $1,300,000; a further result of this transaction, the details of which are not now available, was that control of the entire capital stock became the property of Messrs. Clark, Babbitt, Lane and Needham.

Prior to late 1940 the company and its predecessors engaged in the manufacture of fireworks except for a very successful venture into munitions manufacture during the First World War. Distribution was accomplished through subsidiaries.

The company had the following subsidiaries at 31 August 1942:

National Foundry, Inc., Whitman, Mass.
Iron, aluminum and brass castings; the net worth at 31 August 1942 was $61,861 and its sales for that fiscal period were $460,080.

California Fireworks Co., Ltd., San Francisco, Calif. Apparently in course of liquidation.

Southern New England Supply Co., Providence, R. I.
Handles sporting goods.

Victory Fireworks and Specialty Company, Elkton, Md. Owns a plant rented to the subject contractor but has no other activity.

American Fireworks Company of Massachusetts, Canton, Mass. Commenced assembling and loading of ammunition late in 1942.

National-Hanover Corporation.
Experimental and development work in connection with wool products.

Automatic Machinery Manufacturing Corporation.
This company was acquired in July 1942 but was subsequently sold.

Renegotiation of American Fireworks Company of Massachusetts has been commenced separately from that of the subject contractor.

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Control of Namco Co. Inc. was acquired late in 1942 and it will eventually produce and sell plastics.

The data as to sales, costs and profits for the subject contractor are not consolidated with those of the subsidiaries.

Available information indicates that $2,020,000 has been invested in the preferred stock of Clark-Babbitt Industries in 1943; the common stock of this company is apparently held by the owners of the capital stock of the subject company. It was also indicated that the subject contractor owns 50% of the equity in Pedersen Arms Corp. of New York which is developing a semi-automatic rifle.

A division is currently being operated at Wareham, Mass. (Cape Cod Shipyards) whose activities are said to be making of smoke boats and tugs for the War Department.

(a) Conversion to War Effort:

In 1940 the contractor reorganized the executive and personnel departments and had the plant and equipment appraised, by which capital surplus was created to an amount of $585,115. The common stock issued in exchange during the fiscal year ended 31 August 1941 and the stock dividend issued in December of 1941, both totalling $700,000, resulted in a book transfer from capital surplus account to common stock outstanding. Working capital was secured by borrowings from New York sources.

About that time the contractor obtained the first of its Government contracts for loading and assembling ammunition and military pyrotechnics; by 1941 the entire facilities had been shifted to war production.

Considerable plant expansion has occurred and is almost entirely in emergency facilities; 20% amortization is being claimed. Data submitted show that $5,966,348 has been thus invested.

Contracts with the Navy are largely for the following production:

20 MM High explosive tracer ammunition
20 MM High explosive incendiary ammunition
2 lb. High velocity shells (Lend-Lease)
Magnesium powder

Army Ordnance contracts are:

Fuzes
5.5 shells
Ground signals
Aircraft signals
2 lb. A P shells
.50 caliber tracers under a subcontract with
The Winchester Arms Company

Army Chemical Warfare Service Contracts are:

Incendiary bombs
Grenade fuzes
Incendiary grenades

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Evidence of the rapid growth in production by the company is found in the increase in personnel.

Date	No. of Employees
31 August 1940	175 (est.)
31 August 1941	2,052
31 August 1942	5,851
23 January 1943	13,354
28 August 1943	13,814

(b) Method of Operation and Subcontracting:

The company performs loading and assembly functions in which (as to HET ammunition) the Government furnishes cartridge cases, loaded primers and detonators, brass magazines, packing tubes, propellant powder, packing boxes, tracer composition and projectiles. The contractor furnishes labor, some facilities, supervision, and some supplies such as luting, paint, solvents, graphite brass discs, stencil inks, etc. The contract terms for HEI ammunition are similar.

A rough analysis of cost of goods sold shows the following approximation of the components:

Materials	$ 6,691,000
Direct Labor	3,868,000
Indirect Labor	3,264,000
Factory Overhead	3,265,000
	17,088,000
Less: Inventory Adjustments and Transfers to Fixed Asset Accounts, etc.	3,667,000
Cost of Goods Sold	$13,421,000

While the cost of materials seems disproportionately high, the reason given was that in earlier contracts the contractor supplied a larger part of the ingredients than it does under present contracts. It should be noted that gross costs above are inclusive of $2,296,408 incurred in connection with additions to plant and equipment.

II. Performance, Prices and Contribution

The prevailing opinion of the various procurement officers is that the contractor has performed excellently but that "they make too much money" in view of the nature of the contribution to the war effort.

Navy Bureau of Ordnance officers state that the prices of all ammunition suppliers are very high in view of increased volume so that while the subject contractor's price schedules compare favorably it may not be of great significance.

The contractor is a very important factor as measured by the fact that it produces 20,000,000 20 mm high explosive incendiary and tracer shells out of the industry total of 40,000,000 per month. Three Navy plants (Chillicothe, Ohio, Bristol, Va., and Mayfield, Ky.) produce about 6,000,000 rounds per month each, or almost twice the capacity of its closest competitors. Measured by gross cost of facilities the Government has supplied about 60% of productive facilities in use at date of writing this report.

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The Navy states that manufacturing techniques were fairly complex during the early stages of developing volume production and the contractor solved the incidental problems satisfactorily; the quality of the product has been high, the number of rejections normal and its delivery record excellent. It has done an entirely satisfactory job in reducing costs without passing on a major part of the savings in the form of price reductions. It is claimed that very substantial technical contributions have been made, particularly in the field of tracer composition.

Following investigations by the Bureau of Ordnance the Company agreed to a "voluntary" reduction in prices of about 20%, retroactive to 1 February 1943, which amounted to about $1,000,000 per month and further reductions amounting to about $500,000 per month were made effective 1 March 1943. Bureau officers suggested a refund of $10,000,000 to cover the period of six months through 28 February 1943 to which the contractor countered with an offer of $5,500,000; the latter was finally accepted but it was agreed that renegotiation proceedings were in no way affected.

A tabulation showing price comparisons follows:

Date	Type	National Fireworks	National Munitions	Trojan	Unexcelled	Western
3-13-42	HE	.306		.29		.264
5-23-42	HE	.281	.3125			
5-23-42	HET	.324			.3425	
8-18-42	HET	.2311			.29	
7-1-42	HEI	.2469				
3-24-43	HEI	.1661	.178	.21		
5-28-43	HEI	.1661	.178	.21	.199	.1565

The foregoing data are not entirely reliable because the extent to which competitors' prices were influenced by Government supplied facilities is not known. The fact that the comparisons were submitted by procurement officers does indicate their general feeling and serves to fortify the conclusion that the subject contractor's prices are at least competitive. It should be remembered that the competitors have a very much lower rate of production; for example, while the subject company loads at the rate of 25,000,000 rounds per month the nearest competitor loads at the rate of 3,500,000 rounds per month and the others at rates from 1,000,000 per month to 2,000,000 per month.

The company buys all supplies (exclusive of Government furnished components) from outside sources but it does grind magnesium powder and is the Navy's second largest source. The comparison on this item follows:

Supplier		Cost	Production Rate
National Fireworks		.95	242,500 lbs.
National Magnesium	(Current	.85	
	(Future	.75	250,000 lbs.
Pulverizing Machinery		.93	40,000 lbs.

The contractor was the first manufacturer to do this type of loading and it has co-operated with other contractors by allowing them to examine into the methods of operation. In the case of Victory Ordnance the plant was built and production lines established with the help of the subject contractor but there was a fee paid for this service.

Chemical Warfare Service of the Army reports an inability to obtain price reductions but otherwise finds the contractor entirely satisfactory.

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It was said that CME is paying the subject company .45 per unit for loading incendiary bombs whereas a competitor is receiving only .22; there are also substantial advances involved. The contractor has thus far refused to reduce his prices but in fairness it should be stated that the competitor has requested an increase to .34 on a renewal of its contract.

The matter of the unique risks taken in this industry are reviewed at length in the material submitted to the Board to which reference is hereby made.

Army Ordnance reports that deliveries have been uneven and current deliveries are at a rate less than scheduled. It was stated further that current prices of the subject contractor are substantially higher than those of other suppliers. On production of powder at the Pilgrim plant the contractor encountered manufacturing difficulties at first, causing delays; schedules were subsequently maintained but because of reduced demand and availability of other production, the plant was closed 1 May 1943.

III. Financial Comments

(a) Property, Plant and Equipment:

The balance sheet of the contractor showed regular plant and equipment at a book amount of $819,645, a large proportion of which represented increase by appraisal and not all of which was used in manufacturing operations. In fiscal 1941 the contractor expended $838,735 on emergency facilities and by the end of fiscal 1942 these expenditures had amounted to $5,966,348; at the end of that period facilities paid for by the British Purchasing Commission were usable costing $1,156,623. The Navy supplied the facilities at Mayfield, Ky., Chillicothe, Ohio and Bristol, Virginia, testing ranges and increased facilities at West Hanover. The contractor owned facilities at Cordova, Tenn., West Hanover and Hays Landing, N. J. and rented facilities from a subsidiary at Elkton, Maryland.

The contractor asserts that none of the major facilities supplied by the Navy was available for production during the period ended 31 August 1942.

Certificates of Necessity are held for all emergency facilities and an amortization rate of 20% is being applied.

A summary of productive facilities at 31 August 1942 as obtained from various sources follows:

	Book	% of Total
Regular - Productive	655,907	6.34
Regular - Not Productive	267,819	2.59
Emergency	5,966,348	57.68
Rented (Oral estimate)	200,000	1.93
British Purchasing Commission	1,156,623	11.18
Navy (Disbursements) Eventually to total $5,800,000* or more	2,097,050	20.28
Totals	10,343,747	100.00

Repairs and maintenance for the fiscal years 1941 and 1942 are shown below:

Fiscal Year	Repairs and Maintenance	% to Sales	Depr'n.	Total	% to Sales
1941	$191,986	5.05	164,819	356,805	9.39
1942	673,571	2.56	508,152	1,181,723	4.50

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*At 15 August 1943 Navy facilities actually installed totalled approximately $8,621,000.

(b) Working Capital:

The working capital of the contractor has not been strong during recent periods. The reasons up to 31 August 1942 were obvious and lay in the fact of losses in earlier years and substantial investments in emergency plant and equipment. During fiscal 1942 about $8,539,000 "became available" but $5,208,000 was expended for owned plant and $2,202,000 was expended for plant construction eventually to be reimbursed by the Government; these and other normal expenditures resulted in a decrease of working capital.

During fiscal 1943 the further decrease in working capital is probably traceable at least in part to the retirement of 56% of common stock and the investment said to be $2,000,000 in Clark-Babbitt Industries.

(c) Dividend Policy:

The first dividend declared in several years was declared and paid in fiscal 1942 and amounted to $22,912.50 on preferred stock only.

(d) Executive Compensation:

A list of officers and other personnel receiving in excess of $10,000 per year is shown below:

Fiscal Year Ended August 31

	1941 Salary Bonus, etc.	1942 Total	1942 Salary Bonus, etc.	Annuity
Geo.J.J.Clark, Pres.	$58,090.17	$199,609.00	$177,000.00	$22,609.00
Francis Barrett,Treas.	23,381.47	73,609.00	51,000.00	22,609.00
C.Loring Clark, Ass't. Treas. & Ass't. Clerk (son of J.J.)	20,006.89	68,409.00	45,800.00	22,609.00
George W. Lane, Jr., Vice Pres. & Chairman Fin.Comm.	23,163.51	73,609.00	51,000.00	22,609.00
Daniel Needham, Clerk and Counsel	16,769.14	47,609.00	25,000.00	22,609.00
Richard Whitney	-	10,187.91	5,809.60	4,378.31
Wm. J. Edwards	6,203.38	23,067.05	13,153.86	9,913.19
Edwin V. Babbitt, Exec. V.Pres.	58,090.70	199,609.00	177,000.00	22,609.00
Wm. M. Clark, V.Pres.(son of J.J.)	21,053.68	68,409.00	45,800.00	22,609.00
David Black, V.Pres. & Genl. Plant Mgr.	20,113.47	73,609.00	51,000.00	22,609.00
Alton A. Borland	4,760.05	20,917.16	11,927.84	8,989.32
H. S. King	6,958.05	26,810.41	15,288.48	11,521.93
Geo. K. Perkins (Wash. Rep.)	1,000.00	16,313.97	5,002.90	11,311.07
Charles W. Wannen, Gen. Mgr.	500.00	28,732.83	16,364.74	12,368.09
W. H. Lillard	-	13,658.27	7,788.55	5,869.72
		944.169.60		

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Fiscal Year Ended August 31

	1941 Salary Bonus, etc.	1942 Total	1942 Salary Bonus, etc.	Annuity
John G. Alexander	$ 6,218.61	$26,810.37	$15,288.47	$11,521.90
Harry W. Krasberg	4,978.02	19,475.83	11,105.98	8,369.85
T. N. Aikens	4,791.15	15,326.83	8,740.04	6,586.79
T. L. Davis	-	16,141.46	4,950.00	11,191.46
Willis G. Martin	699.99	12,772.61	7,283.51	5,489.10
Harold B. Chase	4,997.91	18,211.35	10,384.92	7,826.43
C. P. T. Kaffke	11,043.75	39,456.76	22,500.00	16,956.76
Christian G. Storm	-	18,210.72	10,384.56	7,826.16
Frank A. Larkin	2,985.00	14,684.96	8,374.02	6,310.94
George Wallach	4,400.00	11,267.06	6,424.98	4,842.08
T. T. Toole	-	14,103.48	8,042.43	6,061.05
C. B. Allen	-	22,551.24	12,859.72	9,691.52
H. H. Wolfert	2,702.98	14,517.48	8,278.51	6,238.97
S.H.Clark (son of J.J.)	250.00	17,168.85	9,790.44	7,378.41
W. G. Thrasher	5,554.56	24,989.64	14,250.21	10,739.43
Dominick Nero	4,929.37	20,354.59	11,607.09	8,747.50
R. B. Dunham	2,756.53	12,150.37	6,928.68	5,221.69
J. H. Hayes	4,746.81	16,804.45	9,582.64	7,221.81
E. B. Jones	5,349,63	19,556.56	11,152.02	8,404.54
J. H. Roberts	-	21,043.55	11,999.97	9,043.58
C. G. Gulbranson	130.00	10,311.37	5,880.00	4,431.37
R. H. Wolny	175.00	11,166.26	6,367.50	4,798.76
F. A. Simmons	2,775.00	11,205.72	6,390.00	4,815.72
George Schnyer	1,820.00	11,151.27	5,642.38	5,508.89
Salvatore L. Gioiosa	2,340.00	10,825.61	6,162.50	4,663.11
Ralph Carpenter	3,364.58	11,049.36	6,095.02	4,954.34
John C. Hawkins	2,985.00	10,100.93	5,760.00	4,340.93
Charles M. Spedalle	4,770.00	12,310.50	7,020.00	5,290.50
R. W. Weeks	-	11,533.05	6,576.66	4,956.39
Charles Freeman	3,285.00	10,337.67	5,895.00	4,442.67
Thomas Ayers	1,820.00	10,022.29	4,916.55	5,105.74
James J. Nero	1,811.49	10,374.83	5,916.19	4,458.64
Harold E. Parkman	1,461.48	11,103.40	6,331.65	4,771.75
George W. Keller	4,153.92	11,837.24	6,750.12	5,087.12
J. B. Nagle, Sr.	2,800.00	10,436.25	5,110.86	5,325.39
Herbert C. Werner	1,425.00	11,771.27	6,712.50	5,058.77
Thomas B. Dutcher	6,965.00	23,886.45	13,621.12	10,265.33
Albert G. Buckworth	-	10,515.46	5,996.38	4,519.08
Edward H. Luce	2,916.15	15,899.90	9,066.83	6,833.07
Clarence F. Cookson	340.01	11,735.46	6,692.08	5,043.38
Arthur H. Bird	80.77	13,871.69	7,910.25	5,961.44
James K. Boyd	-	14,257.05	8,130.00	6,127.05
Millard R. Jamison	-	11,172.84	6,371.25	4,801.59
Totals	$370,913.22	1,596,633.63	1,064,199.	532,434.63

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It should be noted that the amounts shown on the list under the heading "Annuity" represent amounts which the individual beneficiaries do not report as income subject to Federal income tax, although the subject taxpayer may deduct (as declared by the company's treasurer) the total in arriving at its income subject to tax. The total amount is intended to approximate 12½% of profits before Federal taxes.

The plan in effect was reviewed briefly with the Bureau of Internal Revenue's Employees Pension Section by one of the officers connected with the Navy Board and the opinion was expressed (in confidence) that the plan would qualify under Section 165.

The company maintains that the unusual risks encountered in the course of operations requires that special incentives be given to employees in the form of bonuses, etc.

The company's tax return has been examined through 1941 and there were no disallowances of compensation for that year. The reason for this omission to disallow was indicated to be the fact that Seabord Commercial Corp., a factoring agency, as an adverse interest, approved them. The situation as to 1942 is not clear on this point.

(c) Accounting Methods:

Examination of the contractor's audited reports discloses no substantial variations from usual good accounting methods. Variations from income reported as subject to Federal income tax are shown on Schedule C and in subsequent sections of this report.

There were purchases of land and buildings from members of the Clark family and from certain subsidiary companies involving $91,310 in fiscal 1941 and $52,305 in fiscal 1942; the amount of profit, if any, realized by the vendors and the relationship to market value is not stated in the information available.

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(f) Tax Information:

The tax returns have been examined through 31 August 1941 and the examination disclosed net unallowable deductions of $466,554.

The excess profits credit is based on invested capital and for fiscal 1941 was computed at $55,828 on a consolidated basis; for fiscal 1942 on the same basis the credit was $79,157. In both cases the amounts are stated before the specific exemption of $5,000.00.

A test calculation indicates the approximate accuracy of the liability set up by the company.

There are some items which are stated to be allowable for tax purposes but it is thought that the Board should scrutinize certain of them:

1. Annuity Plan
   The disbursement was measured by approximately 12½% of net income before taxes and amounted to $1,230,028 in 1942; the plan become effective 28 August 1942 and Mr. Barrett stated, although somewhat doubtfully, that there were no past service benefits involved.

2. Provision for Proof Losses
   The provision for fiscal 1942 was $223,529 and is said to be based on experience but there is considerable doubt that reserves of this kind would be deductible if a close scrutiny were directed at the return filed.

(g) Unusual Items of Cost:

1. It is suggested that the attached list of persons receiving in excess of $10,000 per year be scrutinized.

2. Bad Debts have been entirely allocated to commercial business.

3. Losses resultant from capital transactions or from liquidation of subsidiaries have been allocated to non-renegotiable business and therefore no adjustment is made herein.

(h) Post Earnings Record:

The contractor did not submit historical record of earnings for periods prior to 1 January 1937 because these back years were thought to be not pertinent to this inquiry. Information available is set out below:

Period	Net Sales	Profit Before Taxes	Net Income After Taxes	% to Equity
8 mos. to 31 Aug.1937	$ 701,108	-	-	
Year Ended 31 Aug.1938	827,720	($2,843)	($2,843)	
Year Ended 31 Aug.1939	570,717	(155,849)	(155,849)	
Year Ended 31 Aug.1940	226,553	(132,328)	(132,328)	
Year Ended 31 Aug.1941	3,801,397	638,534(1)	313,534(1)	50.17
Year Ended 31 Aug.1942	26,260,931	8,813,483(1)	2,422,583(1)	258.16
6 mos. to 28 Feb. 1943	31,057,277	7,095,288(1)	1,064,288(1)	63.76

(1) Before transfer to Reserve for contingencies, etc. of $150,000 for 1941, $1,250,000 for 1942 and $210,000 for 1943 (six months); 1943 is also after $7,815,779 of "voluntary" price reductions.

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In establishing Net Worth the starting point of 31 August 1940 was assumed to be the amount of $624,881 as computed in establishing "Property paid in for stock and as paid in surplus" for purposes of the excess profits tax return. It is recognized that this was determined on a consolidated basis and that not all assets were used in production but the alternative of using book figures with a problematical adjustment for surplus arising from appraisal of fixed assets seems less desirable. The year ended 31 August 1941 was thus assumed to reflect $624,881 plus earnings after taxes of $313,534 and the year ended 31 August 1942 was assumed to reflect an additional $2,422,583.

IV. Allocation of Sales and Profits

Schedule C is attached for fiscal 1941, fiscal 1942 and the first six months of fiscal 1943. The data thereon are largely self-explanatory but are summarized below:

Six Months Ended 28 February 1943	Direct Government	Foreign	Commercial	Total
Sales Value of Production	30,799,690		257,587	31,057,277
Voluntary Reductions	7,215,776		-	7,215,776
Net Sales	23,583,914	-	257,587	23,841,501
Cost of Manufacture	14,837,566		199,531	15,037,097
Gross Profit	8,746,348		58,056	8,804,404
Operating Expenses-Net	1,195,877		13,239	1,209,116
Operating Income	7,550,471	-	44,817	7,595,288
% to Net Sales	32.01		17.40	31.86

Above data are before provision for inventory losses, $500,000 provision for post war conversion, $210,000 and Federal income taxes.

Year Ended 31 August 1942	Direct Government	Foreign	Commercial	Total
Net Sales	20,771,008	5,277,899	212,024	26,260,931
Cost of Manufacture	11,301,721	1,920,271	199,209	13,421,201
Gross Profit	9,469,287	3,357,628	12,815	12,839,730
Operating Expenses-Net	3,846,251	758,604	392,866	3,997,721
Operating Income	5,623,036	2,599,024	(380,051)	8,842,009
% to Net Sales	31.89	49.24	-	33.67

Above data is based on Federal tax return filed.

Year Ended 31 August 1941	Direct Government	Foreign	Commercial	Total
Net Sales	672,632	2,832,260	296,505	3,801,397
Cost of Manufacture	414,313	1,381,989	168,826	1,965,128
Gross Profit	258,319	1,450,271	127,679	1,836,269
Operating Expenses-Net	116,807	491,992	480,136	988,935
Operating Income	141,512	958,279	(252,457)	847,334
% to Net Sales	21.04	33.83	-	22.29

The above data is adjusted to reflect findings of an agent of the Bureau of Internal Revenue and while there are several items not applicable to Government business, such as net operating loss carry over, these items have all been charged to commercial business.

The contractor has not reflected eliminations for business completed and fully paid for prior to 28 April 1942 but it is not large in amount and Mr. Barrett stated that it could not represent an important consideration in the determination of profits subject to renegotiation.

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The business shown under the heading "Foreign" may contain some Lend-Lease business but definite information is lacking according to the company. Inquiry was directed to Mr. H. J. Devaud, Auditor for British Ministry of Supply in New York and he stated that he knew of only one case in which approximately $500,000 was first paid by the British but Lend-Lease subsequently reimbursed them.

The contractor also makes the argument that there are large amounts of government furnished materials, the sales value of which is not supplied.

In the early part of 1943, in connection with price breakdowns submitted to procurement officers of the Navy Bureau of Ordnance, the company stated that its policy was to add 4.93% of estimated costs to determine selling price of HEI ammunition under contracts performed in Navy furnished facilities; on HET ammunition the percentage was stated to be 4.98%. On both HEI and HET ammunition manufactured in owned facilities the practice was stated to be to add 6.26% of estimated costs to determine selling price. Provision for contingencies was not included in the above data.

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NATIONAL FIREWORKS, INC.
& SUBSIDIARY COMPANIES

EXHIBIT A

SUMMARY BALANCE SHEETS

ASSETS	August 31		
	1940	1941	1942
Current Assets			
Cash	101,287	367,772	3,222,976
Cash in Restricted Accounts			2,755,409
Due From U. S. Government		295,547	3,745,919
Due From British Purchasing Commission		222,857	
Other Receivables	65,228	71,605	230,694
Inventories - Contract Prices		545,425	586,300
Inventories - Cost or Market	247,306	884,768	1,452,655
Total Current Assets	413,821	2,387,974	11,993,953
Ratio	1;1.08	1;1.4	1;1.3
Investments in and Advances to Affiliated Companies	50,000	-	190,001
Property, Plant & Equipment Net			
- Used in Operations	1,064,922	1,552,778	6,197,240
- Not Used in Operations	145,300	279,032	231,833
	1,210,222	1,831,810	6,429,073
Prepaid Taxes, Insurance etc.	34,628	278,826	659,785
Deferred Development Costs		199,463	266,579
Deposits and Miscellaneous	67,532	42,334	178,262
Post War Refund of Excess Profits Taxes			30,000
	102,160	520,623	1,134,626
Total Assets	1,776,203	4,740,407	19,747,653
LIABILITIES			
Current Liabilities			
Notes Payable	-	123,000	812,000
Accounts Payable & Accrued Expenses	205,814	967,915	4,251,425
Advances Payable - Finance Company	242,444	663,497	
Advanced by U. S. on Contracts		355,563	3,877,228
Advanced by Dominion of Canada & British Purchasing Commission		887,253	20,568
Accrued Federal Taxes on Income		326,250	6,770,067
Total Current Liabilities	448,258	3,323,478	15,731,288
Advances and Notes Payable (Long Term)	244,029		
Minority Interest - Subsidiary Company	15,055	15,582	
Reserves			
For Future Losses of Finished Goods			236,089
For Contingencies		150,000	1,260,000
For Self-Insurance		18,952	138,210
	259,084	184,534	1,634,299
Capital Stock and Surplus			
Preferred Stock	200,000	200,000	200,000
Common Stock	100,000	500,000	800,000
Capital Surplus	768,861	368,861	68,861
Earned Surplus	-	163,534	1,313,205
	1,068,861	1,232,395	2,382,066
Total Liabilities, Capital and Surplus	1,776,203	4,740,407	19,747,653

See A1-2

REPRODUCED AT THE NATIONAL ARCHIVES

13843 FS

NATIONAL FIREWORKS, INC.
Summary Balance Sheets
Parent Company

EXHIBIT - A-1

ASSETS	AUGUST 31 1940	1941	1942	February 28 1943 *
Current Assets:				
Cash	39,754	337,443	3,168,168	4,253,901
Cash in Restricted Accounts			2,755,409	2,480,943
Due from U. S. Government		295,547	3,745,919	7,477,949
Construction Advances for U. S. Government	-	-	-	2,078,057(1)
Due from British Purchasing Commission	-	222,857	-	-
Other Receivables	28,064	43,505	195,611	557,201
Inventories - Contract Prices		545,425	586,300	2,225,463
Inventories - Cost or Market	162,931	822,616	1,415,295	1,994,043(2)
Total Current Assets	236,749	2,267,393	11,866,702	21,067,552
Ratio	1 : 1.5	1 : 1.5	1 : 1.3	1 : 1.2
Investments in and Advances to Affiliated Companies	499,170	358,844	513,547	1,538,976(3)
Investments - Other	54,316	-	-	
	553,486	358,844	513,547	1,538,976
Property, Plant and Equipment Net - Used in operations	788,546	1,313,800	5,925,723)	5,923,071
- Not used in operations	27,100	181,192	223,100)	
	815,646	1,494,992	6,148,823	5,923,071
Prepaid Taxes, Insurance etc.	26,642	274,219	653,744	856,097
Deferred Development Costs		199,463	295,671	120,531
Deposits and Miscellaneous	28,490	37,192	170,332	486,365
Post War Refund of Excess Profits Taxes			30,000	633,000
	55,132	510,874	1,109,747	2,098,016
Total Assets	1,661,013	4,632,103	19,638,819	30,627,525

Notes Applicable to February 28, 1943

(1) Net of Advance from U. S. Government of $1,500,000.
(2) Work in Process Inventory of $873,994 is net of reserve for losses of $500,000.
(3) Net of Reserve of $458,229.

* Based on Book Figures and Without Audit Thereof.

NATIONAL FIREWORKS, INC.
Summary Balance Sheets
Parent Company

EXHIBIT - A-1

LIABILITIES

	1940	1941	1942	February 28 1943 *
Current Liabilities:				
Notes Payable	1,716	72,000	800,000	1,200,000
Accounts Payable and Accrued Expenses	107,702	927,443	4,216,462	11,144,146(4)
Advances Payable - Finance Company	242,444	663,497		
Advanced by U. S. on Contracts		355,563	3,877,228	3,520,049
Advanced by Dominion of Canada, British Purchasing Commission and others		887,253	20,568	48,289
Accrued Federal Taxes on Income		325,000	6,708,196	9,964,154(5)
Total Current Liabilities	351,862	3,230,756	15,622,454	25,876,638
Advances and Notes Payable (Long Term)	193,029			
Due to Subsidiary Company	47,261			
Reserves - For Future Losses on Finished Goods			236,089	512,262
- For Contingencies		150,000	1,260,000	1,427,000
- For Self Insurance		18,952	138,210	268,705
	240,290	168,952	1,634,299	2,207,967
Capital Stock and Surplus				
Preferred Stock	200,000	200,000	200,000	200,000
Common Stock	100,000	500,000	800,000	800,000
Capital Surplus	768,861	368,861	68,861	68,861
Earned Surplus	-	163,534	1,313,205	1,474,159(6)
	1,068,861	1,232,395	2,382,066	2,543,020
Total Liabilities, Capital Stock and Surplus	1,661,013	4,632,103	19,638,819	30,627,625

Notes Applicable to February 28, 1943

(4) Includes estimated liability for accountability for loss of components, and $5,500,000 payable to U. S. Navy on account of price adjustment.

(5) $3,933,154 applicable to 8/31/42 and prior - Six Months Ended 2/28/43 at 85% rate.

(6) Net of $89,870 Treasury Shares at cost $1,333,333.

* Based on Book Figures and Without Audit Thereof.

REPRODUCED AT THE NATIONAL ARCHIVES

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REPRODUCED AT THE NATIONAL ARCHIVES

NATIONAL FIREWORKS, INC. Exhibit -B

Summary of Income and Surplus

Parent Company

	Year Ended August 31		Six Months Ended
	1941	1942	28 February 1943
Sales Value of production at contract prices			31,057,277
Less: Voluntary reductions of billing price			1,715,776
Sales Price Adjustment with the Bureau			5,500,000
			7,215,776
Net Sales	3,801,396	26,260,931	23,841,501
Cost of Sales	1,965,127	13,421,202	15,537,097 *
Gross Profit	1,836,269	12,839,729	8,304,404
% to Net Sales	48.3	48.9	34.8
Operating Expenses			
General and Administrative	620,504	2,991,020	769,891
Shipping and Selling Expenses	111,914	437,099	45,388
	732,418	3,428,119	815,279
Operating Profit	1,103,851	9,411,610	7,489,125
% to Net Sales	29.0	35.8	31.4
Other Deductions - Net	165,317	598,127	393,837
Income before Income Taxes	938,534	8,813,483	7,095,288
Federal Income Taxes	325,000	6,390,900	6,031,000
Net Income	613,534	2,422,583	1,064,288
% to Net Equity, beginning of year	50.17	258.16	63.76
Provision for Contingencies	150,000	1,250,000	210,000
Transferred to Surplus	163,534	1,172,583	854,288
Earned Surplus, beginning of year	--	163,534	1,313,205
		1,336,117	2,167,493
Surplus Charges:			
Dividend on Preferred Stock		22,912	
Earned Surplus, end of year	163,534	1,313,205	2,167,493

* Includes Provision for possible loss in inventories of $500,000

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NATIONAL FIREWORKS, INC.

ALLOCATION OF OPERATING PROFIT - YEAR ENDED AUGUST 31, 1951

	Products sold to U. S. Government						Other Customers			
	Total All Contracts	U. S. Navy	U. S. Army	Total Direct	Sub-Contracts	Total U. S. Government	Overseas Purchasing Commission	Canadian	Commercial	Total Other
Sales value of production	$1,501,196.69	$170,365.73	$501,266.61	$671,632.34	$ -	$671,632.34	$2,359,501.34	$127,746.00	$320,905.17	$2,829,152.51
Percentage	100.00%	4.46%	13.21%	17.59%	00.00%	17.59%	62.0/2	12.5	7.30%	82.1
Manufacturing Costs	$1,965,127.61	$146,905.61	$269,467.14	$416,372.95	-	$416,372.95	$1,258,161.27	$127,625.89	$162,874.91	$1,548,662.07
Gross Profit	$1,536,269.07	$ 21,460.12	$231,799.29	$255,259.41	-	$255,259.41	$1,101,344.06	$119,120.02	$157,970.26	$1,377,934.34
Deduct:										
Shipping and Selling Expenses	$ 111,914.35	$ 2,708.95	$ 7,987.78	$ 10,696.73	-	$ 10,696.73	$ 37,912.29	$ 7,522.13	$ 45,163.17	$ 101,217.63
General and Administrative	620,503.51	26,583.10	77,924.55	104,967.65	-	104,967.65	368,506.51	73,814.58	73,413.77	515,535.86
Other Deductions-Net of Other Income	465,117.18	4,116.65	28,521.00	32,637.65	-	32,637.65	114,956.40	21,091.47	294,147.87	430,677.51
Total	$1,197,119.04	$ 33,408.70	$114,433.33	$148,842.03	-	$148,842.03	$ 521,375.20	$102,428.18	$412,724.81	$1,036,528.20
Net profit before federal taxes on income and provision for contingencies, etc.	$ 638,534.02	$ 53,868.82	$129,963.96	$183,832.78	-	$183,832.78	$ 580,073.80	$240,701.59	$ [illegible]	$ 925,713.64
Provision for contingencies, etc.	150,000.00	6,720.00	13,815.00	20,535.00	-	20,535.00	93,105.00	16,560.00	11,700.00	121,365.00
Net profit before federal taxes on income	$ 488,534.02	$ 33,148.82	$116,148.96	$ 49,297.78	-	$ 49,297.78	$ 486,968.80	$224,141.59	$ [illegible]	$ 804,348.64
Plus expenditures not allowed for tax purposes:										
Excess of depreciation per books over amount allowable	$ 51,143.47	$ 3,635.29	$ 12,314.87	$ 15,350.17	-	$ 15,350.17	$ 30,355.30	$ [illegible]	$ 5,329.35	$ 55,154.70
Losses of subsidiary companies	56,604.06	-	-	-	-	-	-	-	56,604.06	56,604.06
Provision for contingencies	150,000.00	6,720.00	13,815.00	20,535.00	-	20,535.00	93,105.00	16,560.00	11,700.00	123,465.00
Excess of tax expense per books over amount allowable	10,155.87	645.30	1,341.51	1,986.81	-	1,986.81	5,722.45	[illegible]	793.00	[illegible]
Loss on sale of fixed assets	2,391.91	107.13	330.15	437.27	-	437.27	1,434.10	267.53	116.40	1,953.64
	$ 550,829.31	$ 10,447.72	$ 27,801.53	$ 38,310.25	-	$ 38,310.25	$ 130,616.85	$ [illegible]	$ 74,543.16	$ 737,170.26
	$ 743,053.43	$ [illegible]	$ [illegible]	$ [illegible]	-	$ [illegible]	$ 617,585.65	$ [illegible]	$ [illegible]	$ [illegible]
Less non-taxable income and adjustments for tax purposes:										
Development expense deferred on books deducted on return	$ 130,463.20	$ 6,933.35	$ 24,570.29	$ 31,503.64	-	$ 31,503.64	$ 102,959.56	$ [illegible]	$ 15,503.13	$ 154,172.15
Expenses re prepared bond issue	6,554.72	-	-	-	-	-	-	-	6,554.72	6,554.72
Net operating loss carry-over	173,251.26	-	-	-	-	-	-	-	119,180.44	119,180.44
	$ 310,269.18	$ [illegible]	$ [illegible]	$ [illegible]	-	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]
	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	-	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]
Net profit per tax return										
Adjustments by Treasury Department:										
Plus additional income and unallowable deductions:										
Net operating loss - current	$ 31,335.71	$ -	$ -	$ -	-	$ -	$ -	$ -	$ [illegible]	$ [illegible]
Provision for taxes	33,765.05	1,462.19	[illegible]	[illegible]	-	[illegible]	30,335.69	[illegible]	[illegible]	[illegible]
Provision for federal pay	10,000.00	548.03	1,335.00	1,709.03	-	1,709.03	6,287.03	1,204.00	780.00	[illegible]
Provision for shipping expense	15,000.00	672.03	1,641.50	2,453.53	-	2,453.53	9,319.56	1,125.00	1,121.91	[illegible]
Provision for organization expenses	13,048.51	548.03	1,335.00	1,331.03	-	1,331.03	11,190.35	[illegible]	[illegible]	[illegible]
Bad debts disallowed	119,000.00	-	-	-	-	-	-	-	119,000.00	119,000.00
Portion of development costs deducted in full deferrable to future operations	230,257.23	13,346.73	35,503.92	48,850.65	-	48,850.65	153,356.04	28,031.15	[illegible]	[illegible]
Excess of depreciation claimed over amount allowed	34,840.13	2,004.23	4,955.70	11,421.93	-	11,421.93	19,342.55	[illegible]	[illegible]	[illegible]
	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	-	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]
	$ 535,086.64	$ [illegible]	$151,701.54	$215,700.34	-	$215,700.34	$ 269,869.13	$223,649.71	$ [illegible]	$ [illegible]
Less non-taxable income and additional deductions:										
Under accrual of federal capital stock tax	$ 20,000.00	$ 1,136.00	$ 2,967.00	$ 12,361.00	-	$ 12,361.00	$ 63,111.00	$ [illegible]	$ [illegible]	$ [illegible]
Under accrual of Mass. excise tax	11,572.13	787.23	2,321.11	3,108.33	-	3,108.33	10,307.16	[illegible]	[illegible]	[illegible]
	$ 31,572.13	$ 1,923.23	$ 11,288.11	$ 15,469.33	-	$ 15,469.33	$ 73,418.16	$ [illegible]	$ [illegible]	$ [illegible]
Net taxable income as adjusted	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	-	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]

(a) For allocation see detailed schedule attached
(b) Allocated on sales value of all contracts

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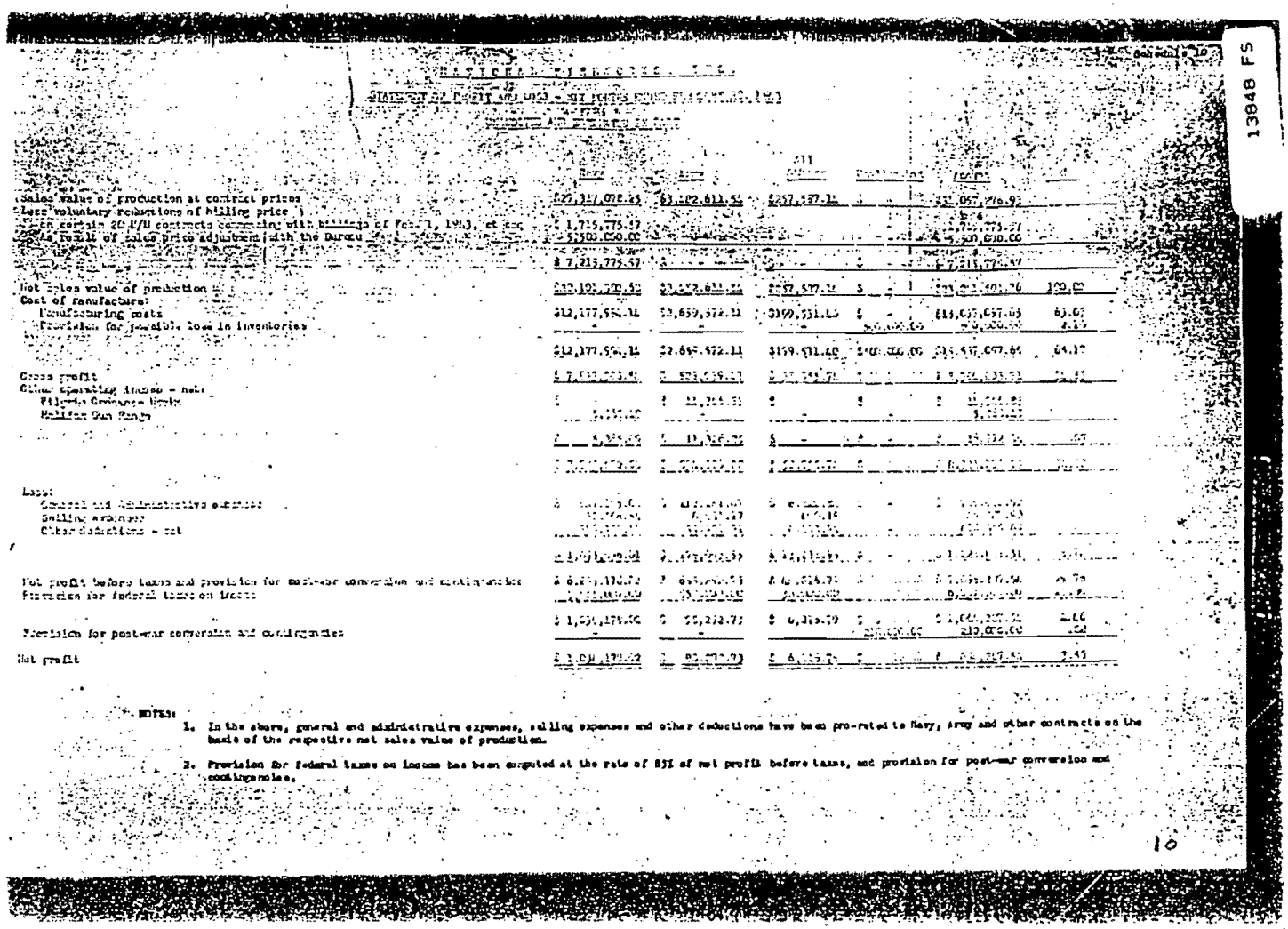
NATIONAL [illegible], INC.

ALLOCATION OF OPERATING PROFIT FOR YEAR ENDED AUGUST 31, 1942

	Contracts with United States Government						Other Contracts			
	Total All Contracts	U. S. Navy	U. S. Army	Total Direct	Sub-Contracts	Total U. S. Government	British Purchasing Commission	Canadian	Commercial	Total Other
Sales value of production	$26,260,930.79	$11,109,330.71	$7,451,078.41	$20,761,309.12	$ 7,698.96	$20,773,008.08	$4,520,604.71	$367,299.60	$212,021.41	$5,099,922.71
Percentage	100.00%	40.66%	28.35%	79.06%	.03%	79.09%	18.16%	1.24%	.81%	20.01%
Manufacturing Costs:										
Material	$ 4,757,172.54	$ 2,963,466.30	$1,240,153.35	$ 4,203,627.65	$ 1,500.19	$ 4,205,128.84	$ 525,967.44	$ 15,390.77	$ 60,734.67	$ 602,092.88
Labor	3,220,573.06	1,425,017.48	1,261,734.59	2,686,752.07	1,694.71	2,691,446.78	436,826.67	48,841.63	45,817.98	529,126.28
Overhead	5,443,455.40	2,296,274.63	2,999,898.40	4,296,173.03	6,922.96	4,605,349.81	496,599.10	51,075.61	92,638.37	1,014,309.65
Total	$13,421,201.00	$ 6,684,758.41	$5,501,816.34	$11,186,452.95	$10,166.86	$11,201,724.01	$1,459,393.21	$115,302.02	$199,201.32	$2,173,918.81
Gross Profit	$12,839,729.10	$ 4,619,594.30	$1,952,152.07	$ 9,574,745.17	$ 2,469.13	$ 9,569,267.07	$3,061,211.50	$252,197.58	$ 12,820.09	$ 3,326,229.17
Deduct:										
Shipping and selling expenses	(A) $ 437,046.97	$ 57,442.56	$ 219,681.76	$ 277,131.32	$ 149.81	$ 277,317.19	$ 95,999.16	$ 957.66	$ 63,824.76	$ 159,781.59
General and administrative	(A) 2,991,020.80	1,521,403.17	646,361.92	2,197,765.09	696.67	2,198,649.76	597,940.69	51,491.11	32,929.27	632,361.04
Other deductions, net of other income	(A) 452,125.66	234,077.12	151,675.95	435,461.07	111.22	435,572.29	139,204.12	9,524.62	47,647.63	196,376.37
Total	$ 3,826,246.43	$ 1,552,922.85	$1,217,515.63	$ 2,910,468.48	$ 955,776.41	$ 3,911,141.07	$ 834,136.37	$ 62,477.39	$ 144,451.60	$ 991,064.36
Net profit before federal taxes on income and provision for contingencies, etc.	$ 8,813,483.27	$ 4,766,671.25	$1,634,625.44	$ 6,401,296.69	$32,909.29	$ 6,434,205.98	$2,227,102.81	$189,911.19	$131,631.74	$2,379,377.29
Provision for contingencies, etc.	(B) 1,350,000.00	611,400.00	466,740.00	458,240.00	375.00	687,615.00	225,600.00	21,750.00	10,125.00	261,375.00
Net profit before federal taxes on income	$ 7,463,483.27	$ 4,155,271.25	$1,167,885.44	$ 5,943,056.69	$32,534.29	$ 5,746,590.98	$2,001,502.81	$168,161.19	$121,506.74	$2,117,972.74
Plus expenditures not allowed for tax purposes:										
Provision for self-insurance	(B) $ 24,157.85	$ 12,243.22	$ 6,656.51	$ 18,937.73	$ 7.25	$ 18,106.58	$ 4,435.36	$ 420.34	$ 195.69	$ 5,051.39
Provision for shipping expense	(C) 21,000.00	10,725.50	6,910.20	16,739.10	6.30	16,745.40	3,687.10	367.50	-	4,254.60
Provision for contingencies	(B) 1,350,000.00	611,400.00	466,740.00	958,240.00	375.00	987,615.00	225,600.00	21,750.00	10,125.00	261,375.00
Provision for losses on investment in subsidiary companies	50,773.32	-	-	-	-	-	-	-	50,773.32	50,773.32
Excess of amortization of deferred development expense per books over amount allowable for tax purposes	(C) 75,529.02	35,659.90	21,423.32	57,083.22	22.57	60,272.29	13,560.97	1,312.26	-	14,873.23
Federal capital stock tax expense per books	(B) 140,525.91	71,294.77	23,757.39	111,183.59	42.19	111,225.34	25,958.75	2,142.28	1,132.95	29,234.08
Excess of depreciation per books over amount allowable for tax purposes	(B) 115,430.71	64,203.93	27,736.31	101,241.34	40.37	106,090.31	25,277.87	2,325.67	1,196.14	28,799.68
	$ 1,787,416.81	$ 815,527.32	$ 547,223.73	$ 1,363,425.16	$ 496.18	$ 1,304,055.31	$ 299,519.04	$ 28,316.05	$ 63,423.10	$ 391,358.19
	$ 9,250,900.08	$ 4,970,798.57	$1,715,109.17	$ 7,306,481.85	$33,030.47	$ 7,050,646.29	$2,301,021.85	$196,477.24	$184,929.84	$2,682,330.93
Less non-taxable income and adjustments for tax purposes:										
Profit of subsidiary company	(C) $ 23,204.39	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 23,204.39	$ 23,204.39
Partial recovery of fire loss	865.00	452.14	251.27	703.41	.27	705.29	159.71	33.99	-	193.70
Loss on liquidation of subsidiary	232,131.50	-	-	-	-	-	-	-	232,131.50	232,131.50
Bad debt disallowed in prior year now deemed to be worthless	5,000.00	-	-	-	-	-	-	-	5,000.00	5,000.00
Increase of management incentive plan expense to amount allowable	(B) 32,746.36	16,600.77	6,435.27	23,036.04	9.43	23,905.27	5,314.21	552.05	265.32	6,131.58
Federal Capital stock tax accrual	(B) 125,700.00	63,350.00	24,475.20	87,825.20	35.98	91,452.43	22,253.10	2,175.00	1,012.50	25,440.60
Depreciation included in portion of development expense not allowable	(C) 1,214.61	620.94	167.62	964.16	.37	968.51	224.82	21.76	-	246.58
	$ 420,861.86	$ 81,023.85	$ 44,372.36	$ 125,395.51	$ 45.77	$ 125,441.49	$ 28,152.86	$ 2,781.71	$261,613.71	$292,548.34
Net profit per tax return	$ 8,842,006.96	$ 4,889,729.52	$1,702,426.84	$ 7,180,155.93	$32,940.73	$ 6,925,204.80	$2,272,868.99	$193,695.53	$ 23,316.13	$2,389,780.65

(A) For allocation see detailed schedules attached.
(B) Allocated on sales value of all contracts.
(C) Allocated on sales value of ordnance contracts



[illegible]

STATEMENT OF PROFIT AND LOSS - [illegible]

Sales value of production at contract prices	$ 7,315,077.65	$ 1,102,611.52	$ 257,537.31	$	$ 8,675,226.48
Less: voluntary reductions of billing price					
On certain 20 F/U contracts commencing with billings of Feb. 1, 1943, as a result of sales price adjustments with the Bureau	$ 1,715,775.17				$ 1,715,775.17
	$ 100,000.00				$ 100,000.00
	$ 7,315,775.17				$ 7,315,775.17
Net sales value of production	$ 7,315,302.48	$ 1,102,611.52	$ 257,537.31	$	$ 8,675,451.31	100.00
Cost of manufacture:					
Manufacturing costs	$ 12,177,564.32	$ 2,659,372.32	$ 159,531.48	$	$ 14,996,468.12	172.85
Provision for possible loss in inventories					
	$ 12,177,564.32	$ 2,659,372.32	$ 159,531.48	$	$ 14,996,468.12	172.85
Gross profit	$ 4,862,262.16	$ 556,760.80	$ 97,005.83	$	$ 5,516,028.79	63.58
Other operating income - net:					
Miscellaneous income	$	$ 12,354.31	$	$	$ 12,354.31
Refunds from Navy	5,370.00				5,370.00
	$ 5,370.00	$ 12,354.31	$	$	$ 17,724.31	.20
	$ 4,867,632.16	$ 569,115.11	$ 97,005.83	$	$ 5,533,753.10	63.78
Less:					
General and administrative expenses	$ 2,731,462.00	$ 313,000.00	$ 54,000.00	$	$ 3,098,462.00	35.72
Selling expenses	17,776.16	6,000.00	1,000.00		24,776.16	.28
Other deductions - net	17,593.33	12,000.00	2,000.00		31,593.33	.36
	$ 2,766,831.49	$ 331,000.00	$ 57,000.00	$	$ 3,154,831.49	36.36
Net profit before taxes and provision for post-war conversion and contingencies	$ 2,100,800.67	$ 238,115.11	$ 40,005.83	$	$ 2,378,921.61	27.42
Provision for federal taxes on income	1,050,400.00	119,057.56	20,002.92		1,189,460.48	13.71
	$ 1,050,400.67	$ 119,057.55	$ 20,002.91	$	$ 1,189,461.13	13.71
Provision for post-war conversion and contingencies	1,050,400.00	119,057.56	20,002.92		1,189,460.48	13.71
Net profit	$ 1,050,400.67	$ 119,057.55	$ 20,002.91	$	$ 1,189,461.13	13.71

NOTES:

1. In the above, general and administrative expenses, selling expenses and other deductions have been pro-rated to Navy, Army and other contracts on the basis of the respective net sales value of production.

2. Provision for federal taxes on income has been computed at the rate of 85% of net profit before taxes, and provision for post-war conversion and contingencies.

10

The Consideration for this conveyance is Ten Dollars ($10.00) and other good, valuable and sufficient consideration, the receipt of which is hereby acknowledged.

WITNESS the signatures of the said Horace Webb, Jr., and this the day and year first above written.

Horace Webb Jr.

STATE OF TENNESSEE)
COUNTY OF SHELBY)

On this 4th day of November, 1941, before me personally appeared Horace Webb, Jr., to me known to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same as his free act and deed.

WITNESS my hand and Notarial Seal at office this 4th day of November, 1941.

(N. P. SEAL)

C. O. Franklin.

My commission expires: Oct. 6, 1945

Notary Public

U. S. Doc. Stamps $0.55
State Tax $0.60

STATE OF TENNESSEE)
SHELBY COUNTY)

Filed for registration Nov. 5, 1941, at 2:27 o'clock P. M., and noted in Note Book No. 95 Page 193 and was recorded Nov. 5, 1941. Fee $1.75 Paid

Sam D. Campbell Registrar

By Roy D. Risley D. R.

G/R

Edward

G Humphreys

THIS INDENTURE, Made and entered into this 4th day of November, 1941, by and between EDWARD G. HUMPHREYS and wife, BERNICE A. HUMPHREYS, of the first part, And NATIONAL PIPE WORKS, INC., a Corporation organized and existing under the laws of the State of Massachusetts with its main office at West Hanover, Mass., of the second part.

WITNESSETH: That for the consideration hereinafter expressed, the first parties have bargained and sold and do hereby bargain, sell, convey and confirm unto the second party, the following described real estate in the Second Civil District, Shelby County, Tennessee, to-wit:

The Edward G. Humphreys 151.00 acre, in Second Civil District, Shelby County, Tennessee, Section 6, Range 6, being that part of the 400 acre tract formerly in the Estate of Mrs. Maria Allen Austin lying west of the center line of Grays Creek Drainage Ditch and more particularly described as follows:

Beginning at an iron stake in the west line of the W. T. Allen 400 acre tract, said point being located [illegible] from an iron stake at the northwest corner of the 47½ acre tract conveyed by W. T. Allen to Mrs. Max Miller. Said beginning point is also the Northeast corner of the 100 acre allotted to Elizabeth C. Allen et al by an act passed out of the [illegible] formerly in the name of Mrs. Maria Allen Austin, running thence [illegible] with the west line of the W. T. Allen 400 Acre tract, passing an iron stake in the south line of the L. & N. R.R. right-of-way at [illegible] in all [illegible] across said right-of-way, passing the north line of same at a distance of [illegible] and continuing in all a total distance of [illegible] feet to the Northwest corner of the [illegible] acre tract which is also the Southwest corner of the [illegible] acre tract; thence [illegible] with the west line of the W. T. Allen 400 acre tract, passing an iron stake in the south line of the said right-of-way at [illegible] feet and continuing across said right-of-way, passing the south line of same at [illegible] feet

10902483

and containing in all a total distance of 5888.94 feet to a stake in the center line of Gray's Creek Drainage Ditch; thence with the center thread of said Drainage Ditch south 13 degrees 58 minutes west 1071.75 feet to a stake at the northeast corner of the Elizabeth T. Allen 100 acre tract; thence along the north line of said 100 acre tract south 89 degrees 59 minutes west 5823.4 feet to the beginning, containing an aggregate of 136.28 acres less 0.57 acres contained in the railroad right-of-way, leaving a net acreage of 135.69 acres of which 0.034 acres is north of the railroad and 135.655 acres is south of the said railroad.

TO HAVE AND TO HOLD THE aforedescribed real estate, together with all the appurtenances and hereditaments thereunto belonging or in anywise appertaining unto the said party of the second part, its successors and assigns in fee simple forever.

And the said parties of the first part do hereby covenant with the said party of the second part that they are lawfully seized in fee of the aforedescribed real estate; that they have a good right to sell and convey the same; that the same is unincumbered; and that the title and quiet possession thereto they will warrant and forever defend against the lawful claims of all persons.

The Consideration for this conveyance is as follows:

TEN DOLLARS cash in hand paid, receipt whereof is hereby acknowledged, and other good and valuable considerations.

WITNESS the signatures of the said parties of the first part this the day and year first above written.

Edward G. Humphreys
Bernice A. Humphreys

STATE OF TENNESSEE)
COUNTY OF SHELBY)

On this 7th day of Nov. 1941, before me personally appeared Edward G. Humphreys and wife, Bernice A. Humphreys to me known to be the persons described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

WITNESS my hand and Notarial seal at Memphis, State and County, aforesaid, this 7th day of Nov. 1941.

(N. P. SEAL)
My commission expires Oct. 3, 1944

Roy L. Stone
Notary Public

U. S. Doc. Stamps $8.05
State Tax $8.70

Filed for registration Nov. 7, 1941, at 4:14 o'clock P. M., and noted in Note Book No. 95 Page 189 and was recorded Nov. 10, 1941. Fee $1.75 Paid

Sam D. Caulfield ..... Register

G/R

By Roy D. Risley ..... D. R.

THIS INDENTURE, made and entered into this 4th day of November, 1941, by and between Wallace E. Johnson, Inc., a Tennessee Corporation having no Corporate Seal, party of the first part, and Joseph B. McGregor and wife, Evelyn L. McGregor, parties, of the second part

WITNESSETH: That for the consideration hereinafter expressed the said party of the first part has bargained and sold and does hereby bargain, sell, convey and confirm unto the said parties of the second part the following described real estate, situated and being in the City of Memphis, County of Shelby State of Tennessee

The South 50 feet of the North 250 feet of Lot 1, John Raggio Estate Subdivision, more particularly described as:

Tom Leatherwood, Shelby County Register of Deeds: Book [illegible] Page 344

This Indenture, Made and entered into this 4th day of November 19[illegible]
by and between John D. Schwarm and wife, Jennie Eaton Schwarm,
of the first part, and Motorola Inc. a Corporation organized and existing
under the laws of the State of Massachusetts and its main office at East Hanover
of the second part.

WITNESSETH, That for the consideration hereinafter expressed, the said parties of the first part
have bargained and sold and do hereby bargain, sell, convey and confirm unto the said party of the second part
the following described real estate in the Second Civil District Shelby County, Tennessee, to-wit:
Being a part of Parcel No. 2 as particularly described as follows: Beginning at a point in the West 65
acres of the North 154.36 acres lying south and 23 feet from the center line of the St. Louis Railroad and more particularly described as follows:
Beginning at a point on the south side of the intersection of the said line of the Mason Road
and the East line of the N.C. & St. L. Railroad right of way; running thence North 89
degrees 58 minutes west along the south line of the Mason Road a distance
of 729.25 feet to a stake at an angle in said road; thence continuing along the south
line of the said Mason Road south 89 degrees 58 minutes west 464.5 feet to a point; thence
leaving said road and running south 6 degrees 08 minutes west 332
feet to an iron stake in the north line of the right of way of the said railroad; thence south
89 degrees 58 minutes east along the north line of the said railroad 1141.5 feet to a point where said right of way curves to the left; thence
continuing along the line of said right of way along a curve to the left with
a radius of 3942 feet a distance of 174.25 feet to the point of beginning containing

TO HAVE AND TO HOLD the aforedescribed real estate, together with the appurtenances and hereditaments thereunto belonging, or in any wise appertaining, unto the said party of the second part, its successors and assigns in fee simple forever.

And the said parties of the first part do covenant with the said party of the second part that they are lawfully seized in fee of the aforedescribed real estate; that they have a good right to sell and convey the same; that the same is unincumbered;
and that the title and quiet possession thereof they will warrant and forever defend against the lawful claims of all persons.

THE CONSIDERATION for this conveyance is as follows:

WITNESS the signature of the said parties of the first part
this day and year first above written.

State of Tennessee

STATE OF TENNESSEE, COUNTY OF SHELBY } On this 4th day of November 1947, before me personally appeared John D. Schwarm and wife, Jennie Eaton Schwarm
to me known to be the person described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

WITNESS my hand and Notarial Seal at Memphis, Shelby County, Tennessee, aforesaid this 4th day of November 1947.

Notary Public

My Commission expires

STATE OF TENNESSEE, SHELBY COUNTY. } Filed for registration Nov. 4, 1947 at 4:30 P.M. and entered in Note Book No. 1[illegible] page 65 and was recorded Nov. 4, 1947 at 4:30 P.M.

Fee $1.75 paid. By Ray D. Kelley D. R.

15

This Indenture, Made and entered into this 13 day of February 1942

by and between John H. Schwann and wife, Jennie Poston Schwann, parties

of the first part, and National Fireworks Incorporated, a corporation organized and existing under the laws of the State of Massachusetts, with its main office at Hanover, Massachusetts, party

of the second part.

WITNESSETH, That for the consideration hereinafter expressed, the first parties

have bargained and sold and do hereby bargain, sell, convey and confirm unto the second party

the following described real estate in the City of Memphis, Shelby County, Tennessee, to-wit: The following tractor parcel of land lying and being situated in the county of Shelby and State of Tennessee: The east 60.29 acres of the 125.29 acres of the J. H. Schwann 154.3 acres lying between the N. C. & St. L. Railroad on the west, the center line of the Grayer Creek Drainage Ditch on the east and south of the Macon Road, and said 60.29 acres being more particularly described as follows: Beginning at an iron stake in the south line of the Macon Road 1194.47 feet eastwardly along the south line of said road from the east line of the N. C. and St. L. Railroad Right of Way, running thence eastwardly along the south line of the Macon Road with the meanders thereof as follows: South 88 degrees 50 minutes east 1610.25 feet to a stake, south 84 degrees 39 minutes east 499.2 feet to a stake, south 60 degrees 41 minutes east 76.24 feet to a point where the south line of the Macon Road intersects the center line of the Grayer Creek Drainage Ditch; thence down the center thread of said Drainage Ditch with the meanders thereof as follows: South 16 degrees 48 minutes west 241 feet to a stake, south 25 degrees 28 minutes west 300 feet to a stake, south 19 degrees 28 minutes west 300 feet to a stake, south 13 degrees 58 minutes west 420.75 feet to a stake in J. H. Schwann's south line 103.3 feet west of an iron stake at Schwann's south east corner; thence south 89 degrees 51 minutes west along the south line of the Schwann tract 1915.7 feet to an iron stake; thence north 6 degrees 08 minutes east 132 feet to the beginning, containing 60.29 acres. Said real estate being in Section 2 Range 5 [illegible] Civil District of said Shelby County, Tennessee.

TO HAVE AND TO HOLD the aforedescribed real estate, together with all the appurtenances and hereditaments thereunto belonging, or in any wise appertaining, unto the said party of the second part, its successors

heirs and assigns in fee simple forever

And the said parties of the first part

do hereby covenant with the said party of the second part that they are lawfully seized in fee of the aforedescribed real estate; that they have a good right to sell and convey the same; that the same is unincumbered,

and that the title and quiet possession thereto they will warrant and forever defend against the lawful claims of all persons

THE CONSIDERATION for this conveyance is as follows:

[illegible]

WITNESS the signatures of the said [illegible]

this day and year first above written.

[illegible]

STATE OF TENNESSEE, COUNTY OF SHELBY. On this [illegible] day of [illegible] 19[illegible] before me personally appeared [illegible]

to me known to be the person described in and who executed the foregoing instrument, and acknowledged that [illegible] executed the same as [illegible] free act and deed.

WITNESS my hand and Notarial Seal at [illegible] aforesaid, this [illegible] day of [illegible] 19[illegible]

[illegible]

Notary Public

My Commission expires: Oct. [illegible]

STATE OF TENNESSEE, SHELBY COUNTY. Filed for registration Feb. 13 19[illegible] at [illegible] o'clock, [illegible] M., and noted in Note Book No. 96 page [illegible] and was recorded [illegible] 19[illegible]

[illegible] Register.

Fee $ 1.95 paid.

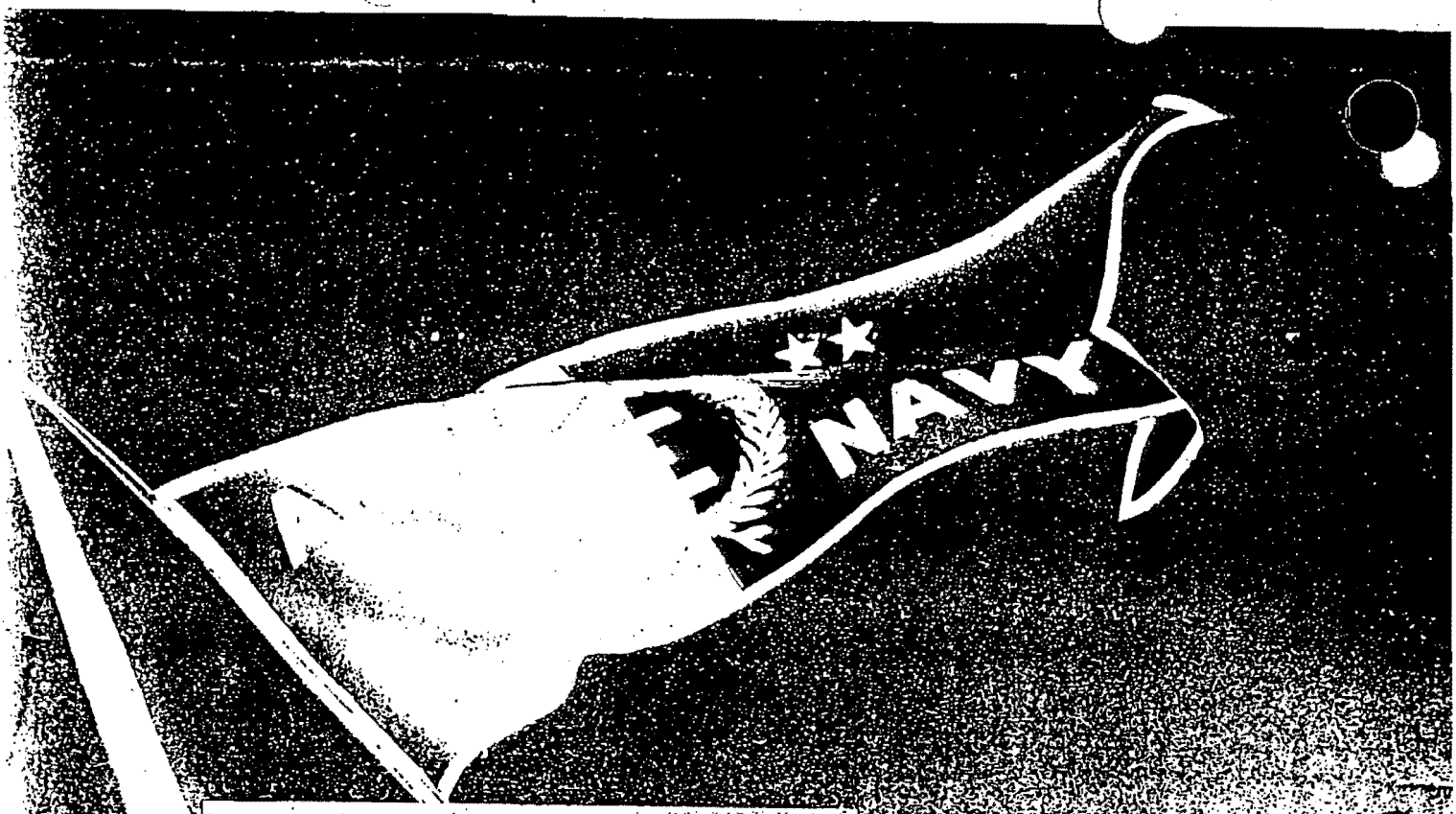
By [illegible] D. R.

10902484

NATIONAL FIREWORKS Review

PUBLISHED IN THE INTEREST OF THE NATIONAL WAR EFFORT BY NATIONAL FIREWORKS, INC

12133 FS



This Book

is

Dedicated

to the

BUREAU OF ORDNANCE

Navy Department

•

ORDNANCE DEPARTMENT

U. S. Army

•

CHEMICAL WARFARE SERVICE

U. S. Army

12134 FS

NATIONAL FIREWORKS, Inc.

National's part in the war effort is a well-established record of which every member of the National organization can be proud. We have gone "all out" to do everything, in every way possible, to speed the day of Victory. We have utilized to the fullest extent every facility we could muster—men, money, and machines.

Long before the United States entered the war, we saw the handwriting on the wall and set out to form a team of men that would be capable of doing the "impossible" almost as quickly as the "merely difficult." We scoured the country for men of outstanding ability, tops in their respective fields, and brought them together here at National—a team that is not afraid to tackle *any* problem.

We used every dollar we had, and borrowed what we didn't have, to meet emergencies where money was required to eliminate delay and speed vital production.

To do required jobs, we got the best machines made for the purpose. When machines couldn't be had, we used Yankee ingenuity and did the jobs anyway.

Every man and woman in the National organization has done his or her part, and the results have been good. Navy "E's" and Army-Navy "E's" have come from appreciative and splendidly cooperative Army and Navy bureaus. We have been, and are, producing the goods—*enough and on time*—of the quality necessary to do the best possible job

But, there is another great problem that National must face in order fully to serve its people and its country. That is the job of postwar accomplishment. We must continue to give employment to our presently employed men and women, and provide jobs for our people returning from the battlefronts.

Unless we, and other companies like National—the thousands now engaged in total war activity — plan with practical purpose for quick conversion to peacetime operation, our country will face a chaotic situation second only in danger to war.

National is already working and planning for the peacetime world to come. We are confident that we can lick this problem as successfully as we have licked so many others, and march forward together into the brighter, better World of Tomorrow.

E. V. Babson

Executive Vice-President

12135 FS

PRODUCTION HONORS

Main Plant

HANOVER, MASSACHUSETTS

Navy "E"	January 12, 1942
Navy "E" Burgee with Anchor	May 1, 1942
Army-Navy "E" with Star	December 18, 1942
Army-Navy "E" with Two Stars	March 10, 1943
Army-Navy "E" with Three Stars	August 17, 1943
Army-Navy "E" with Four Stars	December 31, 1943

CORDOVA, TENNESSEE PLANT

Army-Navy "E"	December 8, 1942
Army-Navy "E" with Star	June 30, 1943
Army-Navy "E" with Two Stars	December 13, 1943

ELKTON, MARYLAND PLANT

Army-Navy "E"	March 18, 1943
Army-Navy "E" with Star	August 21, 1943

BRISTOL, VIRGINIA PLANT

Army-Navy "E"	October 23, 1943

AMERICAN FIREWORKS CO.
Randolph, Mass.

Army-Navy "E"	October 9, 1943

CHILLICOTHE PLANT

Army-Navy "E"	January 22, 1944

12136 FS

NATIONAL FIREWORKS Review

PUBLISHED IN THE INTEREST OF NATIONAL WAR EFFORT BY NATIONAL FIREWORKS, INC.

E. WILLARD FLINT, Editor of National Fireworks Review and the National News, the Employees' Magazine of National Fireworks, Inc.

This first number of the National Fireworks Review is in no sense a yearbook or history of National Fireworks, Inc. It is being published, not at the end of the war effort to summarize achievements—nor at the beginning to pre-view our abilities—but rather as an unfinished record of performance which may, or may not, be added to in the future.

This Review, for the most part, takes the form of a magazine published in the interest of the national war effort and to record in an informal way a number of subjects related to our activities as "loaders and fillers" of ammunition for the armed forces.

Many things which might have been said have been left unsaid. For excellent reasons we cannot even allude to certain phases of our contribution to the war effort. But, we have tried to succeed in making what we can tell at this time interesting to professional and layman alike.

Credits and Thanks

The Editor desires to express appreciation to Dr. Tenny L. Davis, Dr. C. G. Storm, Dr. Joseph Ackerman, Jr., Colonel Walter H. Lillard, Major C. P. T. Kaffke, Mr. W. Melvin Clark, Mr. David Black, Mr. Clark B. Allen, Mr. Earl Willson, and Mr. A. A. Borland of National Fireworks, Inc., for their helpful collaboration.

• • •

Typography and layout has been done under the supervision of Mr. Hugh Dunnell, Vice-President and Art Director of Tracy, Kent & Co., Inc., of New York City.

• • •

A large part of the photography was done by the well-known industrial photographer, Robert Yarnall Richie of New York. On pages 6 and 7, Official U. S. Navy photographs have been used. Other photographers whose work is included are Louis Fabian Bachrach of Boston, H. Armstrong Roberts of Philadelphia, Acme Photos of New York, Cassaday's Studio, Frederic Lewis and Lawrence C. House, Edmund Kent and Wiggin Merrill of National Fireworks, Inc.

• • •

Printing is by the Optak Process by Edward Stern & Company, Inc., of Philadelphia and New York City.

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12137 FS

12138 FS

RED AMMUNITION

IN BLUE PACIFIC SKIES

A Report on a South Pacific Incident Released by the Navy Department

IN the summer of 1942 the Navy requested National Fireworks, Inc., to develop a special piece of ammunition for use in anti-aircraft guns and adapted particularly for the Pacific Area. After months of work in our Research Laboratory a shell was developed which we thought would bring the results that the Navy required in the South Pacific. A trial run of this piece was completed and shipped to the Navy who turned it over to Captain Thomas Leigh Gatch. We have now received a report from the Navy Department as to the efficiency of this piece of ammunition.

In describing a particular action in the South Pacific in which the battleship under his command downed 32 Japanese planes, Captain Gatch said that the anti-aircraft guns worked continuously for more than 25 minutes of intense firing and with only one failure that was caused by water splashing into the barrel from a near miss from a bomb. The guns on his ship, spouting steel at the rate of 4,000 rounds per minute, put up a volume of fire that spelt suicide for any dive bomber that attempted to go through it. The battle took place on the morning of October 26, 1942, as the ship was steaming along in position to protect an American carrier force seeking three Japanese carriers moving from the north toward the Solomons. Many of this ship's crew were entering a combat zone for the first time and her officers included many newly-commissioned reservists.

Over the ship's public address system Captain Gatch asked the men if they were ready for action. From every part of the mighty battleship the answer came blaring back through the speaker on the bridge: "Aye, aye, Sir!" The first attack launched by 20 enemy dive bombers lasted eight minutes. The Jap planes ran into a wall of flaming steel set up by the ship's anti-aircraft guns. Every one of the 20 dive bombers was destroyed. The ship was using special ammunition developed and loaded by National Fireworks at West Hanover, Mass., and, as the whipping fire from the guns caught one speeding target after another, the Jap planes seemed to explode and disintegrate at the end of the streams of fire which looked like crimson bursts from huge Roman candles.

Half an hour later the Japs came on again to assault the battleship and an aircraft carrier she was escorting. 40 torpedo planes and dive bombers roared down in waves about a minute and a half apart. "Our ship was cutting circles and figure eights and other maneuvers without names," related the skipper. "I was more afraid of ramming the carrier than of the attacking planes." The withering barrage of fire from the guns on the ship downed or turned back all but one of the Japs. This one, a torpedo plane, its wings clipped by shells, was jarred out of its line of flight and released its torpedo well in the air. For a moment it seemed that the torpedo would drop on the ship but it passed over into the sea on the opposite side of the stern.

The third and final attack of the day, arriving on the wings of 24 dive bombers and torpedo planes, followed about an hour later and lasted eleven minutes. Now for the first time the battleship received a hit. One of the dive bombers, penetrating the curtain of anti-aircraft fire, screamed down upon the ship. Captain Gatch, as he stood on the bridge's exposed catwalk, saw its bomb released not 100 feet above the bow. "I hoped it would strike the turret and not the deck," he said, "for it was a good sized bomb — probably a 500 pounder — and it might blow a hole in the deck and hurt the men below; and it certainly would kill many in the gun crews on the deck itself." While the bomb fortunately did land on the turret, it proved not so lucky for the skipper himself. A fragment of the bomb tore into his neck severing an artery. Another ripped the muscles of his shoulder. He was knocked unconscious against the conning tower. His ship came through, however, and the crew joyfully counted up their score for the day — 32 enemy aircraft blasted in fewer than that number of minutes of fighting.

Photograph by Ollie Atkins

By permission Saturday Evening Post: Copyright 1943, Curtis Publishing Company

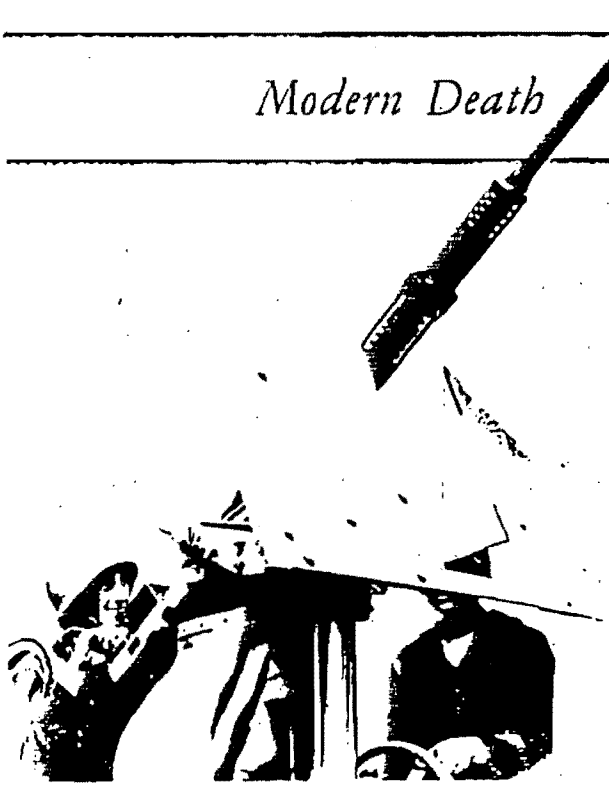
CAPTAIN* THOMAS L. GATCH, U.S.N., of Annapolis, Maryland, was awarded the Navy Cross for this action by Admiral William F. Halsey, Jr., U.S.N., Commander, South Pacific Area and South Pacific Force.

*Now Rear Admiral.

12139 FS

THE OERLIKON

Modern Death Ray of the Skies



EARLY in the war the Nazi propaganda machine darkly hinted in vaguely-phrased stories that they were holding in reserve a devastating mystery weapon, usually alluded to by them as a "death-ray."

But after Dunkirk, when Nazi dive bombers preyed upon Britain's vital sea lanes of supply, there began to appear on the decks of the harried merchantmen and British Navy convoying craft an A-A gun which demonstrated its right to the title of the "modern death-ray of the skies." Not the veiled threat of a superman's death-ray — but an actual death-ray of flying destruction streaming skyward with ample striking power to effectually sweep the Nazi aircraft from the skies.

The 20 MM Oerlikon gun met the test of Britain's most critical period of sea warfare so effectively that dive bombing tactics over ships carrying this protection were almost wholly abandoned by the Nazi. Today, many merchant-marine ships of both Britain and the United States are equipped with these guns and carry their specially-trained crews to operate them. The British and United States navies mount these death-rays of the skies along the hulls of aircraft carriers, clustered along the superstructures of battleships and cruisers, and amidship on destroyers and sub-chasers. These guns are the answer to dive bombing and all other forms of air attack. They are the genuine, real-life death-rays of this war.

The Oerlikon 20 MM gun is of European design, originating at the Oerlikon Machine Works, Ltd., at Oerlikon, Switzerland. Both the British and United States navies have adapted the distinctive Oerlikon features to their own techniques of manufacture.

This gun develops a rate of fire of approximately 400 shots per minute. In rapid fire a full magazine of 60 rounds of ammunition is discharged from the gun in 9 seconds. A new magazine can be snapped in place immediately without interrupting the action of the gun. The effective range of this gun is over 5,000 feet, roughly one mile.

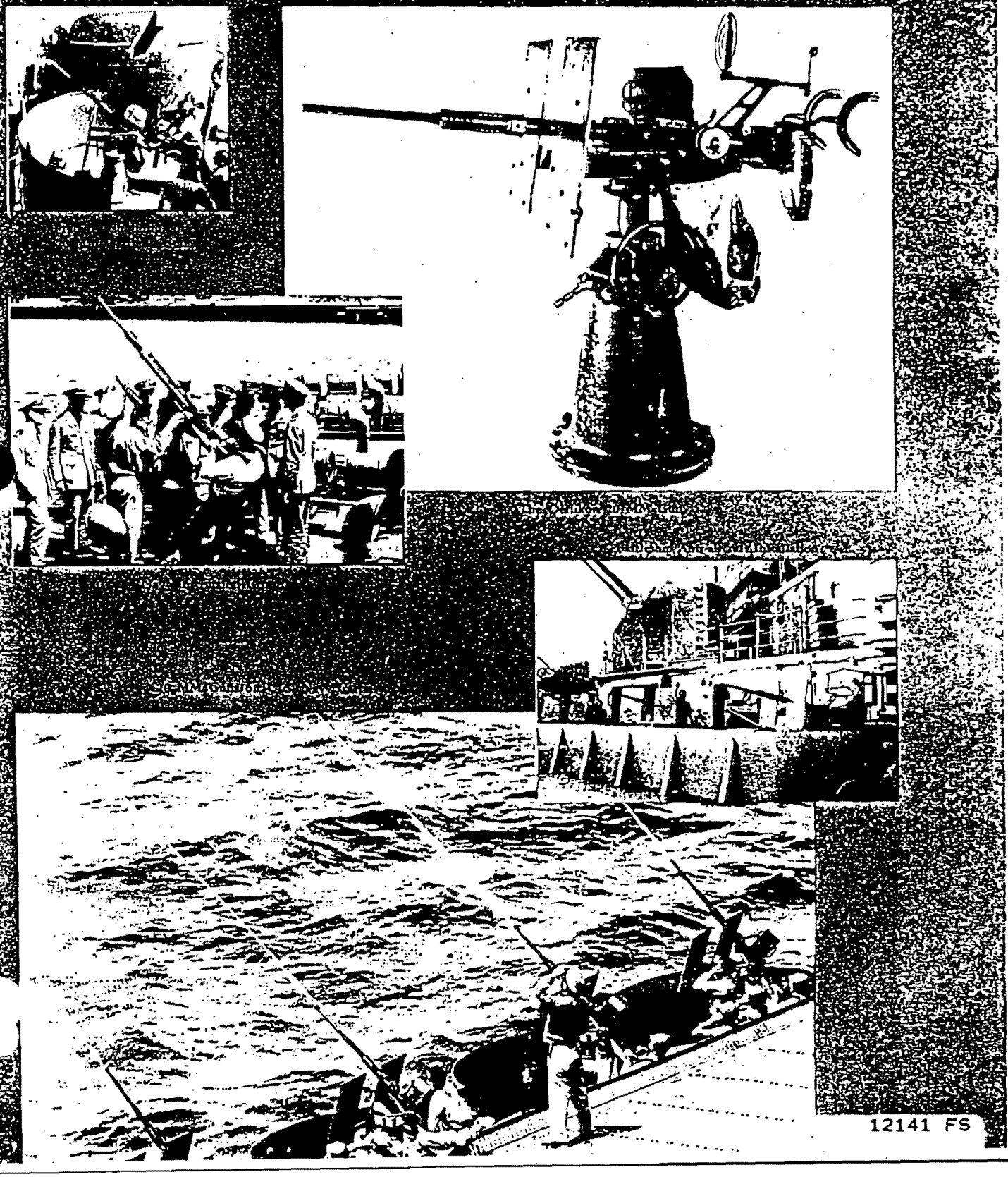
The gunner, rapid-firing this gun, with the shoulder-brackets against his body, and both hands held on the firing mechanism, swings the barrel of the gun with his body as he aims through the sighting apparatus and follows the course of his fire by the tracer. He has the sensation of playing a hose of powerful impulses — a continuous stream of projectiles — far different from the sensation of machine-gun operation.

A cluster of special ammunition for this gun, recorded in the Navy news release printed on the foregoing page, would indicate that the end is not yet in sight of the capabilities of this gun in anti-aircraft warfare, or the development of still greater effectiveness in the ammunition which it uses . . . the death-rays with which it stabs the skies.

U. S. Navy Photograph

FINDING A SKY TARGET

12140 FS



12141 FS

NATIONAL FIREWORKS, Inc. *War Harbor, Massachusetts*

CONFIDENTIAL REPORT OF "THAT GOOD RED AMMUNITION"

[illegible]

The new special type of [illegible] ammunition [illegible] the South Pacific was a special production problem [illegible] by experience and resourcefulness was peculiarly [illegible] upon the production resources developed in this [illegible] military pyrotechnics during World War II [illegible] in the hands of some of the same individuals.

While the confidential nature of the Company's operations precludes telling more than a skeleton story of this project, it may be of interest to note some of the steps taken in producing this important contribution to the Navy's war matériel.

The major burden of pyrotechnical research fell upon Warren Thresher whose long familiarity with this line of work, both during the last war and in commercial fireworks, qualified him to direct the experimental stages of the project. A period of several weeks of experimental procedure followed. Rounds of ammunition containing new mixtures of [illegible] made tested on the range, and proved over and over until the desired results was [illegible] for use in actual battle test by the Pacific Fleet was received [illegible]

New machinery was designed by John Alexander, Chief Engineer, change overs in equipment were made in unbelievable time, and the special assembly lines were set up for operation. The task of getting production out in record time was entrusted to Hugh Wolfert, supervisor of all 20 MM projects at Main Plant No. 1, who selected from the plant personnel a hand-picked force of trustworthy and highly skilled operators for this project. All records of production for experimental ammunition were broken by this especially created assembly line.

To insure that the final results of our research work should be exactly represented in each and every round of this ammunition Thomas N. Aikens, Chief Inspector of all National products, personally supervised the inspection of this record run.

That the painstaking research, engineering, production and inspection effort put into this special project have been rewarded by the performance of this ammunition in battle, is frequently demonstrated in the story of Captain Gatch's exploits.

Note: The description of this ammunition as "that good [illegible] the fact that [illegible] were painted red at a means of [illegible]

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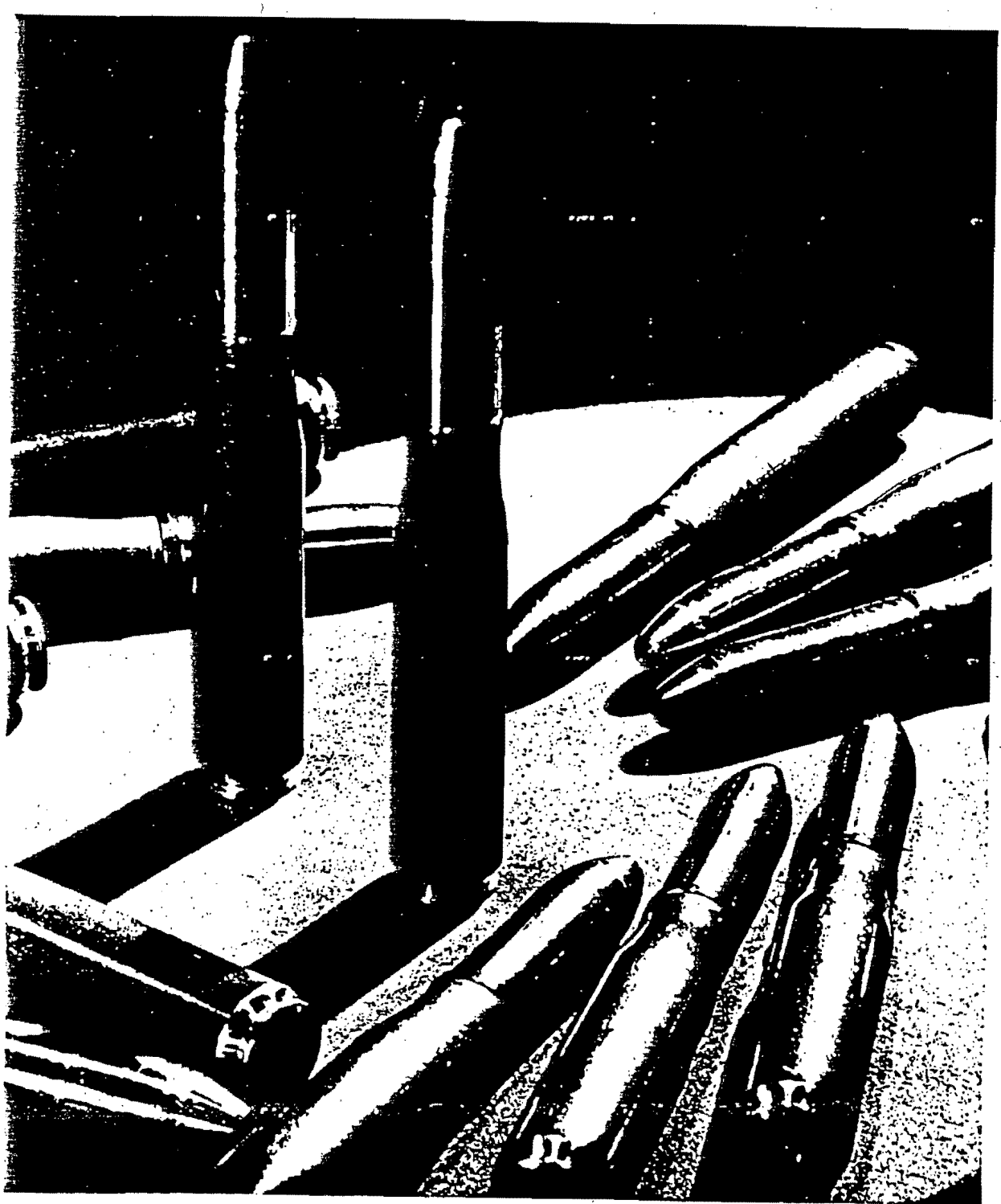

20 MM ROUNDS

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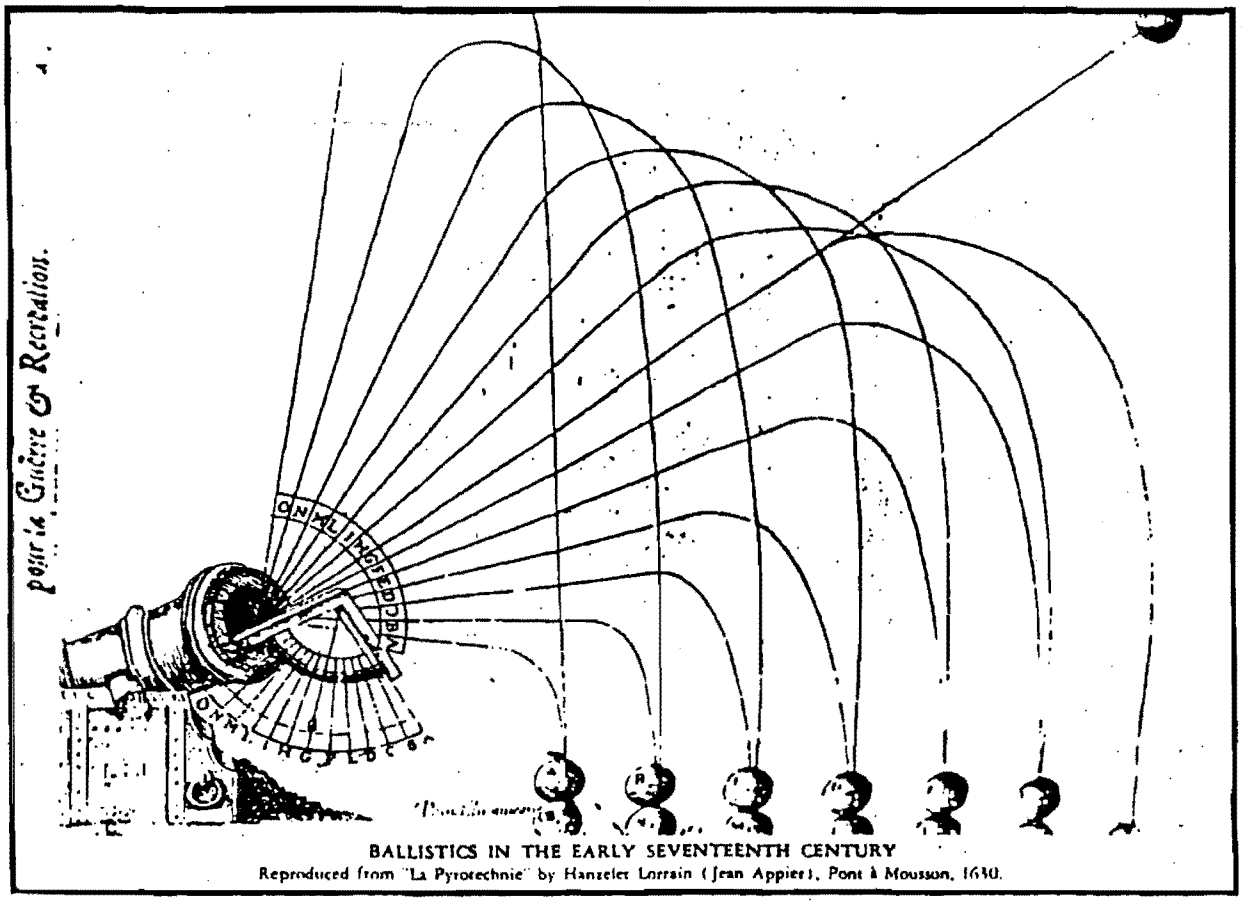

BALLISTICS IN THE EARLY SEVENTEENTH CENTURY
Reproduced from "La Pyrotechnie" by Hanzelet Lorrain (Jean Appier), Pont à Mousson, 1630.

MILITARY FIREWORKS
Modern Tracer Bullets and Phosphorus Shells

12144 FS

CULTURAL RELATIONSHIPS OF EXPLOSIVES

Their Usefulness Begins and Ends—in Peace

by TENNEY L. DAVIS

EXPLOSIVES are to be listed among the chemical substances which have been of great service to man. They have been potent factors in promoting the growth of civilization and the spread of culture. Although enormous quantities are being used at present for the destructive purposes of war, yet it is probably true in the long run that military explosives represent not more than 5% of all of the explosives which are produced. Ninety-five percent is used for beneficial and creative civil purposes of peace—to dig canals, to gain access to minerals under the earth, to open the way for engineering accomplishments of all kinds: Truly, explosives are substances of good repute and of good associations.

It is interesting to note that the discovery of America, the discovery of printing, and the discovery of gunpowder occurred at about the same time in history. And very difficult indeed it is to assess the comparative values of these discoveries and to decide in one's own mind which of them has been the most important or has done the greatest good. By the "discovery of gunpowder," we mean the discovery that useful mechanical work can be done by the combination of chemicals, saltpeter, sulphur, and charcoal, out of which black powder is made. This mechanical work, to cite only one example, has given us coal and iron ore, and has been directly responsible for bringing on the present age of steel and, with it, such things as great ocean steamships, rapid communication, the automobile, the airplane, and the radio. It has made possible the rapid and wide diffusion of knowledge consequent upon the discovery of printing, and it has made possible the use and development of the new wealth, the new foods, the new drugs, and the new lands of the Americas.

Roger Bacon, about 1250, was probably the first in Latin Europe to set down a description of black gunpowder and to foresee the possibilities of its use. He considered the material so important that he concealed its exact composition in an anagram and in a little problem in algebra by which the solution of the anagram could be checked. Thus, he disclosed the composition only to the most studious and most intelligent of his readers. The treatise "On the Marvelous Power of Art and of Nature and on the Nullity of Magic," which is ascribed to Roger Bacon and which contains the famous black powder anagram, closes with the words—"Whoever will rewrite this will have a key which opens and no man shuts, and when he will shut, no man opens." Although guns did not come into use until about 1350, it is evident that Roger Bacon foresaw that useful—and irreversible—mechanical work could be accomplished by means of his powder. And since his time explosives have shut the door upon much that is evil and opened the door permanently to much that is good.

Antiquity of Fireworks

Fireworks are older than explosives, and fireworks—pyrotechnics or the arts of fire—were used for pleasure and entertainment, and for magic, as in the exorcising of demons, long before they were used for purposes of war.

Some unknown scientist of an early time discovered that combustible material burned much more brightly and vigorously if saltpeter was

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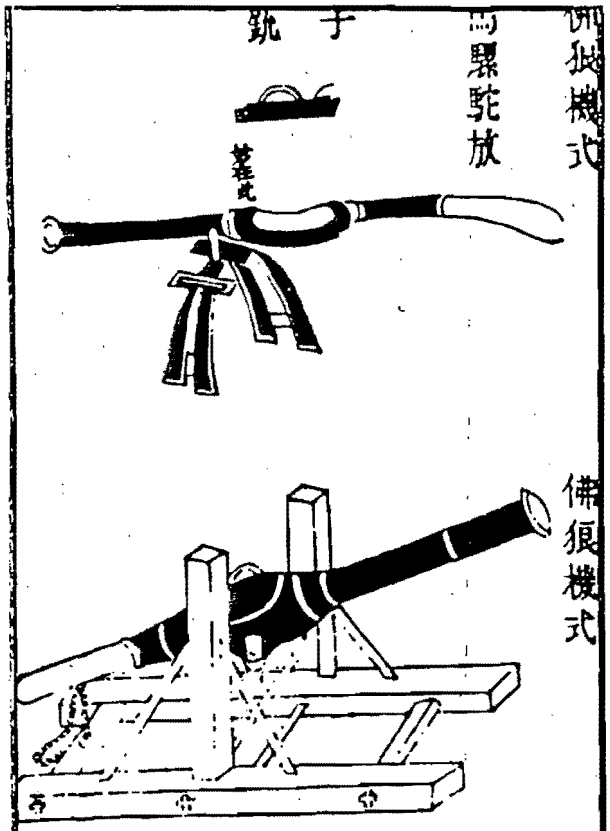


BREECH-LOADING CANNON. Reproduced from a late sixteenth century Chinese text* in the Library of Congress, by permission of the Chief, Division of Orientalia.

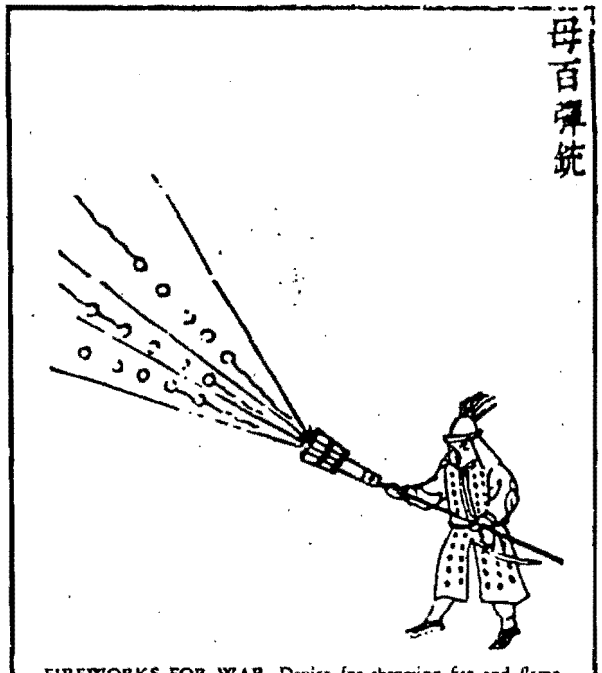
added to it. Saltpeter (potassium nitrate) was found as an effluorescence in various arid places on the surface of the earth. It was the final product from the putrefaction of nitrogenous animal and vegetable materials. It had interesting properties. It was readily soluble in water and crystallized in handsome geometrical forms. It was a good preservative for meat. It had a pleasant and cooling taste, and actually lowered the temperature of water in which it was dissolved. The Emperor Nero is reported to have used it for cooling his wine. It was an article of commerce at an early date.

By using saltpeter with different combustible materials different visual effects were produced. Sound and motion also resulted according to the method by which the combustible material was utilized or packaged. An intimate mixture of finely-powdered saltpeter, sulphur, and charcoal burned with a single, quick flash, and it is this mixture which later found use as gunpowder. Other compositions burned for a longer time with a bright light, with a smoke, or with the throwing about of glowing or of scintillating sparks; and still others were designed which would burn when thrown through the air and could not be extinguished by water or by sand. Crackers, rockets, gerbs, and wheels were all known at an early date, and all were charged with compositions which contained saltpeter and were in fact black powder or modified black powder. The earliest printed books on fireworks describe the same devices as those which are used today. For three centuries at least no important improvements have been made in the mechanical construction of the pieces; the improvements have been in the use of new chemicals. Potassium chlorate is a more vigorous oxidizing agent than potassium nitrate. Its use, beginning early in the nineteenth century, gave brighter flames and sharper explosions. Certain safe high explosives have been made from this material, but it has never been slowed down sufficiently to make a satisfactory propellant powder. Barium salts for green, and strontium salts for red, soon came into use for the production of more interesting colors. Toward the end of the century magnesium was used for intensely brilliant lights, and, soon after, the cheaper and more stable aluminum for "electric" effects.

The early history of fireworks is obscure. Pyrotechnic devices were apparently invented in China where they were developed to a fairly high state, and from China a knowledge of them evidently found its way to Byzantium over the trade routes. There is evidence which indicates that Chinese and European fireworks later developed independently but along parallel lines. The Chinese had breech-loading cannon at the beginning of the seventeenth century, perhaps earlier. As early as the Sung dynasty they used rocket-propelled arrows for purposes of war.

Greek Fire — Early Incendiaries — Firecrackers

The earliest known document on the subject of fireworks and explosives is probably the "Book of Fires for Burning the Enemy" which was written by Marcus Graecus in the eighth century. This describes various mixtures containing saltpeter for use in crackers and rockets and in the Greek fire which made the Byzantines so successful for several centuries in their warfare against the Moslems. The latter fire was ejected from tubes attached to the prows of ships or from small hand siphons, or the combustible material was fastened to heavy stones and thrown with the projectiles from ballistic machines. It was of course enormously effective against wooden ships and against personnel.



FIREWORKS FOR WAR. Device for throwing fire and flame. Reproduced from an early seventeenth century Chinese text* in the Library of Congress, by permission of the Chief, Division of Orientalia.

* The two Chinese texts from which pictures are here reproduced are being studied by Chao Yün-ts'ung and Tenney L. Davis, who expect later to publish translations from them with pictures of many early Chinese pyrotechnic devices.

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"Greek fire," wrote Marcus Graecus, "is made as follows: Take sulphur, tartar, sarcocolla, pitch, melted saltpeter, petroleum oil, and oil of gum, boil all these together, impregnate tow with the mixture, and the material is ready to be set on fire. This fire cannot be extinguished by urine, or by vinegar, or by sand."

The same writer describes another mixture which resembles black powder more closely, and tells how it is used in firecrackers and rockets. He even specifies grapevine and willow charcoal which, with alder charcoal, are still the preferred charcoals for making fuze powders and other grades for special purposes.—

"Take one pound of pure sulphur, two pounds of grapevine or willow charcoal, and six pounds of saltpeter. Grind these three substances in a marble mortar in such manner as to reduce them to a most subtle powder. After that, the powder in desired quantity is put into an envelope for flying (a rocket) or for making thunder (a cracker). Note that the envelope for flying ought to be thin and long and well-filled with the above-described powder tightly packed, while the envelope for making thunder ought to be short and thick, only half filled with powder, and tightly tied up at both ends with an iron wire. Note that a small hole ought to be made in each envelope for the introduction of the match. The match ought to be thin at both ends, thick in the middle, and filled with the above-described powder. The envelope intended to fly in the air has as many thicknesses (ply) as one pleases; that for making thunder, however, has a great many."

Firecrackers appear to have been used as toys by European youngsters before the composition with which they were filled was yet known to European scholars. Roger Bacon judged that they would be useful in war because of their frightfulness. He wrote:

"Certain inventions disturb the heating to such a degree that, if they are set off suddenly at night with sufficient skill, neither city nor army can endure them. No clap of thunder could compare with such noises. Certain of these strike such terror to the sight that the coruscations of the clouds disturb it incomparably less. . . . We have an example of this in that toy of children which is made in many parts of the world, namely an instrument as large as the human thumb. From the force of the salt called saltpeter so horrible a sound is produced at the bursting of so small a thing, namely a small piece of parchment, that we perceive it exceeds the roar of sharp thunder, and the flash exceeds the greatest brilliancy of the lightning accompanying the thunder."

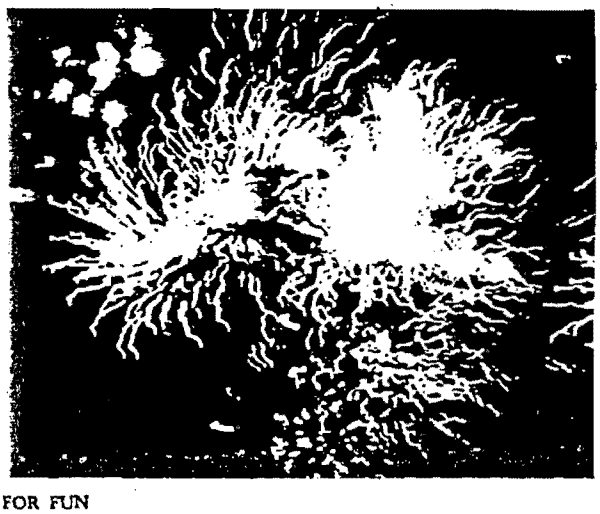
Composition of Black Powder

Roger Bacon's gunpowder formula called for six parts of saltpeter, five of young willow charcoal, and five of sulphur, and did not correspond by any means to the most powerful combination of the three ingredients. After the invention of guns, numerous studies were made to determine the most advantageous proportions of the components. Since the time of Queen Elizabeth it has been accepted that the best ballistic effects are secured from black powder made according to the 6:1:1 formula, that is, saltpeter 75%, charcoal 12.5%, and sulphur 12.5%, or according to the formula, saltpeter 75%, charcoal 15%, and sulphur 10%, or between the two or thereabouts. For four or five centuries no significant improvements have been made in black powder except in the methods of its manufacture, in the shape of the grains, etc. For ballistic use it has been largely superseded by smokeless powder, the result of advances in chemistry, but it still remains the best material there is for communicating fire or for producing a quick hot flame for the ignition of smokeless powder.

Importance of Nitrogen

The property of saltpeter which qualifies it so well for use in gunpowder is its property of supporting combustion, its property of giving up its oxygen readily to substances which have a great tendency to react with that element. Other nitrates possess this same property as does also nitric acid itself, a happy balance of readiness to give over the oxygen with a tendency toward retention of the oxygen sufficient to make them stable. There are other substances, such as potassium chlorate and permanganate, which contain oxygen enough but give it up so readily that their usefulness is limited. The oxides of nitrogen, and their compounds and derivatives, appear to be uniquely suited to the needs of the explosives worker.

When black powder burns, the nitrogen of the nitrate forms nitrogen gas, the oxygen combines with the charcoal and the sulphur to form compounds of which some are gaseous and some, into the composition of which the potassium enters, are solid. The hot gases, largely nitrogen and carbon monoxide and dioxide, produce the expansive effect of the explosion; the solids, largely potassium carbonate, sulfate, and sulfide, produce the smoke and contribute nothing to the



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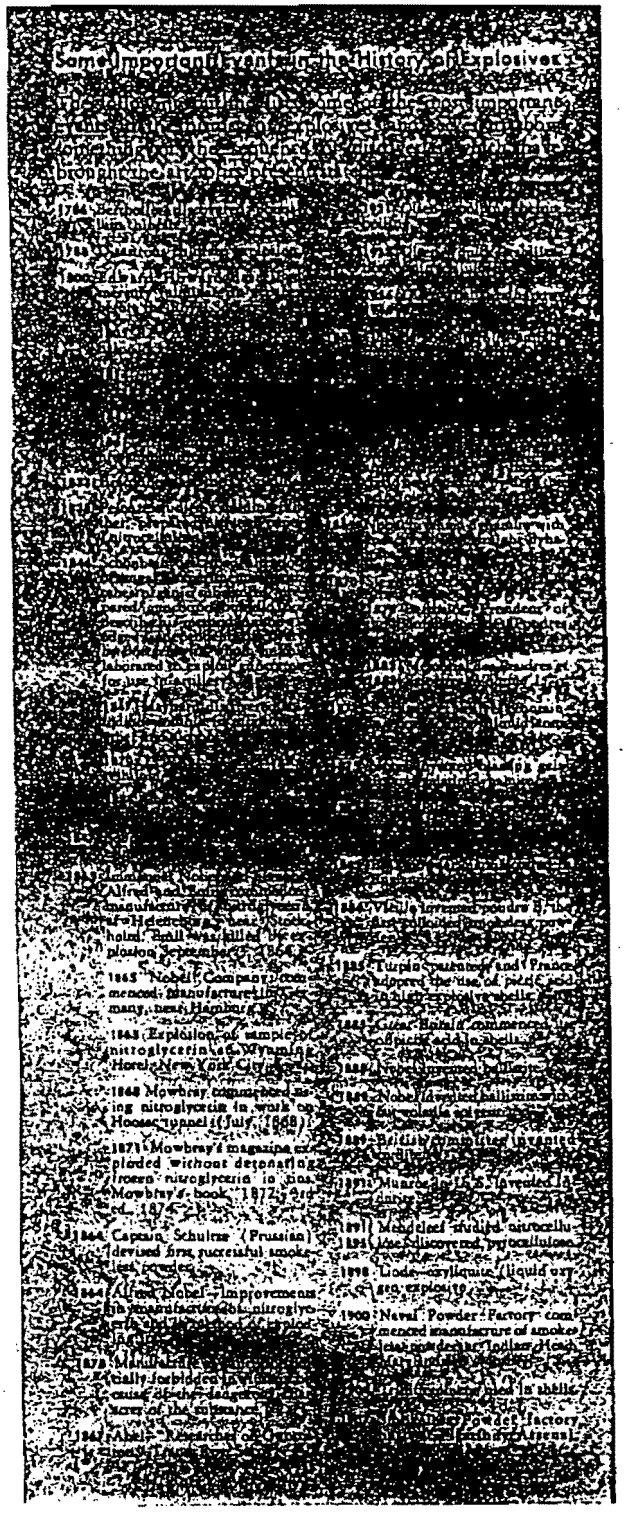


force of the explosion. When black powder burns, about 56% of its weight is converted into useless smoke. Compounds such as ammonium nitrate, cellulose nitrate (nitrocellulose), and glyceryl trinitrate (nitroglycerin) contain only elements which yield gaseous oxides, they produce no smoke, and are more powerful explosives in consequence.

Combined nitrogen, then, is absolutely essential for the production of explosives. The development of new explosive substances, the production of ammonia and nitric acid for their manufacture, and the actual making of them from combined nitrogen and other materials—all these are problems for chemistry.

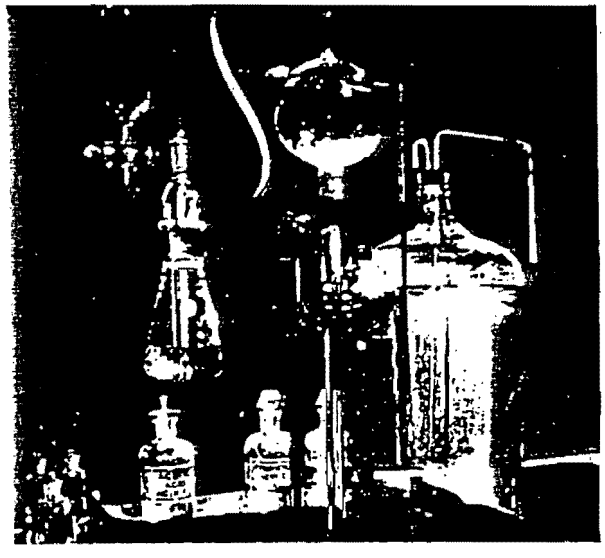
Chemistry in Warfare

There appear to be three principal varieties of warfare.

1. Physical
2. Chemical, and
3. Psychological.

In the first, we attack the enemy with physical instruments, tooth and claw, tomahawk, mace and pike, dagger and bayonet, bullet and fragments of metal from a shell or bomb. This is the commonest method of waging war. And it is an ancient one, appearing early in the evolutionary process. Cats and tigers are beautifully equipped by nature with instruments of physical warfare. In the second, we attack the enemy with chemical agents, smoke which gets in his eyes, tear gas, sneeze gas, mustard and phosgene. This method of warfare is very much more ancient in the evolutionary process than any of the others. The feeble and slow-moving skunk is equipped to practice it, and the primitive and unsubstantial jelly fish which yet is able to sting. In the third method, we work our will upon the enemy through the use of propaganda and other psychological devices which cause him by his own acts to do the things we wish. This is the most recent, the most subtle, and the most powerful of the several methods.

Explosives in warfare are devices which apply matter physically in a manner to do physical injury to the person or to the property of the enemy. Chemical warfare is outside the interest of the present



LABORATORY RESEARCH

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CLEARING FARMLAND

discussion. When we speak in this article of the importance of chemistry in warfare, we wish to be understood as referring to the physical warfare in which explosives are effective.

Herman Boerhaave, Professor of Chemistry at Leiden, was acquainted more than two centuries ago with certain combinations of chemicals, such as nitric acid and oil of cloves, which were capable of reacting with explosive violence. Black powder was the only explosive known to him which was suitable for use in war. Yet he was so fully convinced of the importance of chemistry for war that he wrote the following extraordinary and thoroughly modern observation upon it.

"It were indeed to be wish'd that our art has been less ingenious, in contriving means destructive to mankind; we mean those instruments of war, which were unknown to the ancients, and have made such havoc among the moderns. But as men have always been bent on seeking each other's destruction by continual wars; and as force, when brought against us, can only be repelled by force; the chief support of war, must, after money, be now sought in chemistry."

If this were true in Boerhaave's time, how much truer it is today when we are able by chemical processes to convert the inert but endlessly accessible nitrogen of the atmosphere into the combined or fixed nitrogen of ammonia and nitric acid. These substances are necessary for the production of explosives, and they are utterly necessary too for fertilizers and the growth of plants. Man's newly-acquired ability to synthesize them from the air has given him a new status in the universe. He is now no longer dependent upon the unsolicited bounty of nature for his food. He can demand his food and can cause the unfertile soil to yield it to him. And we note, in passing, that that chemistry which is most fundamental for war is also truly fundamental for peace, for the very sustenance of life itself.

Definition and Classification of Explosives

An explosive is defined as a material, either a single substance or a mixture of substances, which is capable of producing an explosion by its own energy.

The various materials which conform to this definition may be classified according to their modes of behavior, according to the manner in which they release their energy, according to the stimuli which induce them to produce explosions. There are thus three classes of explosives.

1. Propellants or low explosives function by burning rapidly; they produce hot gas and the expansion of the gas produces an explosion. Examples are black powder and smokeless powder.

2. Primary explosives or initiators explode or detonate when they are heated or subjected to shock. They do not burn. They explode, whether they are confined or not. The substances themselves, when they explode, tear themselves apart, and produce a considerable local shock, which is capable of initiating the explosion of the so-called high explosives. The most important primary explosives are mercury fulminate and lead azide.

3. High explosives differ widely among themselves in their combustibility, sensitivity to shock, friction, etc., but are characterized by their ability to be exploded by the shock of the explosion of a suitable initiator. Examples are dynamite, trinitrotoluene, tetryl, picric acid, nitrocellulose, nitroglycerin, ammonium nitrate, ammonium picrate, and nitroguanidine. Nitroglycerin burns easily and is exploded easily by shock. Nitroguanidine does not burn at all. Ammonium picrate, properly loaded in a shell will withstand impact against heavy armor plate without exploding.

NAVAL FIREPOWER

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Behavior of Typical Explosives

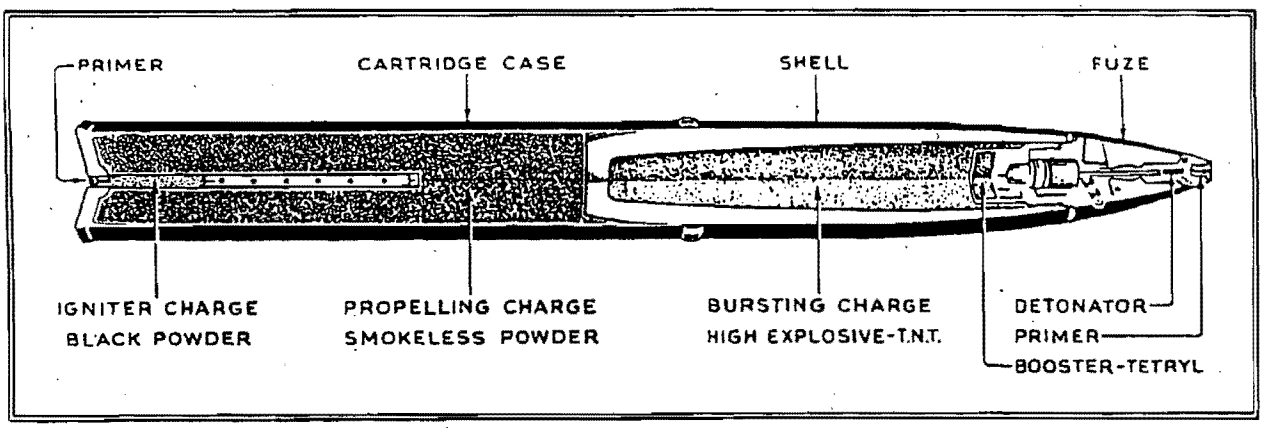
Primary explosives occur in two places in the complete round of H. E. ammunition, in the primer cap at the base of the cartridge case, and in the fuze at the nose of the shell. The purpose of the primer cap is to produce fire when the trigger strikes it. The cap contains a mixture of mercury fulminate, potassium chlorate, and antimony sulfide. The fulminate in the first instance produces fire which ignites the antimony sulfide and this burns at the expense of the oxygen of the chlorate to produce a flame which sets fire to the black powder in the primer or igniter. The large flame from the black powder sets fire to the smokeless powder which constitutes the propelling charge.

If the fuze is a combination fuze designed to explode the shell either upon impact with the target or at a certain predetermined time after it has left the muzzle of the gun, then it contains a primer cap which is fired by means of an inertia-operated device at the moment that the projectile starts its flight. The fire from this lights a train of black powder, the length of which has been adjusted by turning the time train rings, and from the end of this passes to the detonator, loaded with fulminate or azide, which explodes the shell. If the time train rings have been set to burn to a dead end without bringing fire to the detonator, then the shell explodes only after it strikes the target. In this case an inertia-operated device fires a primer cap from which the fire passes directly to the detonator.

The high explosive with which the shell is loaded is one, obviously, which is insensitive enough to tolerate the shock of being fired from the gun. Trinitrotoluene (TNT) is generally preferred for this purpose. It is manufactured by treating toluene (a coal tar hydrocarbon) with mixed nitric and sulfuric acids. It melts at 81.5° C., below the boiling point of water, and is cast in the shell or loaded by pouring. After the TNT has cooled in the shell, a cavity for the booster is bored out in the middle of the front end of the charge, next to the detonator. This is filled with the booster explosive, usually tetryl, more sensitive and more brisant than TNT, which serves the double purpose of securing a better detonation of the principal charge and of making it possible to build satisfactory ammunition which contains smaller and hence safer quantities of fulminate or azide.

To one who is not familiar with explosives, the smokeless powder of the propelling charge is perhaps the most mysterious and impressive component of the ammunition. It is a dense colloided powder, having the appearance and about the toughness of horn. In the open it burns slowly. In the confined space of the chamber of the gun, where the heat of its burning serves to accelerate the rate, it burns rapidly, but none the less progressively, and in such manner that it pushes the projectile, and continues to push it, harder and harder, until the moment that the projectile leaves the muzzle of the gun.

U. S. military powder is a nitrocellulose powder in the form of short cylindrical grains having seven longitudinal perforations. The short grains make it possible to blend many small lots of powder into a large lot which is ballistically uniform. British cordite contains both nitrocellulose and nitroglycerin, and exists in the form of single-perforated amber-colored, flexible sticks or cords. It is hotter and more erosive in the gun than straight nitrocellulose powder, but it is also more powerful. When pushed by either of these powders, a 75mm anti-aircraft shell starts on its flight with a velocity considerably greater than half a mile per second.



DIAGRAMMATIC REPRESENTATION of a complete round of high explosives ammunition, showing the relationships of the various parts.

OUR BOMBS DROP ON TOKYO!

BY DIRECT WIRE FROM
WESTERN UNION

LONG WUM93 148 2 EXTRA DL GOVT=GV BOSTON MASS MAY 21 433P

THE EMPLOYEES OF NATIONAL FIREWORKS INC=

GENERAL DOOLITTLE COMMA WHO LED THE FLIGHT OF AMERICAN BOMBERS OVER TOKIO AND HALF A DOZEN OTHER JAPANESE CITIES HAS JUST TOLD ME THE DAMAGE DONE BY OUR RAIDING PLANES IS A HIGH TRIBUTE TO THE BOMBS YOU MADE PERIOD QUOTE EVERY BOMB SEEMED TO REACH ITS TARGET UNQUOTE GENERAL DOOLITTLE SAID PERIOD QUOTE ONE SALVO MADE A DIRECT HIT ON A NEW WARSHIP UNDER CONSTRUCTION AND LEFT IT IN FLAMES PERIOD INCENDIARY BOMBS WERE POURED DOWN ON A QUARTER OF A MILE OF AIRCRAFT FACTORY PERIOD ANOTHER BOMBARDIER GAVE IT TO A TANK FARM PERIOD EXPLOSIONS SHOOK THE GROUND COMMA FLAMES SHOT UP AND EVEN TWENTY FIVE MILES AT SEA OUR REAR GUNNERS COULD WATCH SMOKE RISING THOUSANDS OF FEET IN THE AIR PERIOD UNQUOTE THE CHEMICAL WARFARE SERVICE OF THE ARMY IS PROUD OF YOU AND OF THE BOMBS YOU MADE PERIOD END SPPIL

=PORTER MAJOR GENERAL
CHIEF OF CHEMICAL WARFARE SERVICE
WASHN DC.

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12151 FS

HIGH EXPLOSIVES AT SEA
U.S. NAVY BATTLESHIP FIRES 3 FORWARD 16 INCH GUNS

THE EFFICIENCY OF EXPLOSIVES

Large Energy Losses as a Factor in Cost

by C. G. STORM

THE efficiency of an explosive may be defined as the percentage of its total available energy actually expended in doing the work for which the explosive is used. It is, therefore, necessary to know the manner in which the useful energy of a given explosive is exerted in performing its work.

For our purpose it is convenient to divide explosives into three general classes: (1) propellants, (2) disruptive or blasting explosives, and (3) initiating explosives or detonators. The useful energy of a propellant is expended in setting in motion a projectile; that of a disruptive explosive in fragmenting or dislodging some material which is to be destroyed or moved; that of a deronator in setting up a disturbance of such intensity as to bring about the release of the chemical energy stored up in another explosive with which it is in close contact, thereby causing it to detonate or explode.

The total energy of an explosive may be expressed as the total amount of heat, in calories, evolved when a unit weight is exploded, or it may also be expressed in terms of mechanical energy (foot-pounds) by multiplying the number of calories by the factor 3.085. The total energy of fuels or other combustibles is expressed in exactly the same manner, as calories evolved when a unit weight of the substance burns in oxygen (or air), which makes it possible to compare the available energies of explosives and ordinary fuels. Contrary to popular ideas, explosives are far from being economical and efficient sources of energy, when compared with ordinary combustibles used for generating heat. Thus, whereas petroleum evolves 12,000 calories per gram, coal 8,000, and wood about 4,000, nitroglycerin liberates only 1470 calories per gram, guncotton 1100, picric acid 810, and mercury fulminate only 410. It must be remembered, however, that the function of an explosive is to perform work by the conversion of its heat energy into mechanical energy in an exceedingly short space of time, whereas fuels evolve their heat energy slowly.

It is of interest to compare two liquid substances, one an explosive, nitroglycerin, the other a combustible, benzene (a liquid similar in physical properties to gasoline).

1 gram of nitroglycerin on being detonated evolves about 1470 calories.

1 gram of benzene on being burned evolves about 9470 calories.

However, the benzene, like other combustibles, cannot burn without being supplied with oxygen to support its combustion, while nitroglycerin contains its own oxygen and will explode out of contact with air or oxygen.

It is, therefore, only fair to include with the benzene the necessary proportion of oxygen (4.36 parts of oxygen to 1 part by weight of benzene). The comparison is then:

1 gram of nitroglycerin — 1470 calories.

1 gram of mixture of benzene and oxygen — 2330 calories.

Since oxygen in its normal state is a gas, it is proper to make the comparison in terms of equal volumes, instead of equal weights, whereupon the picture becomes still more radically altered:

1 cubic centimeter of nitroglycerin—2350 calories.

1 cubic centimeter of benzene and oxygen (gas)—4.4 calories.

If, on the other hand, the oxygen mixed with the benzene were liquid oxygen, that is ordinary oxygen of the air converted to the liquid state at high pressure and very low temperature, then the mixture would be actually a high explosive, capable of detonating with the evolution of much energy. Weight for weight, such a mixture possesses about 1.6 times as much energy as nitroglycerin (see above), but volume for volume this superiority of the liquid oxygen - benzene mixture disappears, because of the fact that both liquid benzene and liquid oxygen are appreciably lighter than nitroglycerin, and hence the mixture occupies more space for a given weight.

C. G. STORM, PH.D., Technical Director, National Fireworks, Inc. Beginning in 1901 Explosives Chemist, Navy Powder Works and U. S. Bureau of Mines. Directing Chemist, Aetna Explosives Co. 1915-1917; Major and Lt. Col., Ordnance Department, U. S. Army, 1917-1919; Research Chemist, Trojan Powder Co., 1919; Chief Explosives Chemical Engineer, Office of the Chief of Ordnance, War Department, 1919-1942.

12153 FS

UNCLE SAM'S BIG GUNS ROAR INTO ACTION

In general, it may be said that mixtures of combustible liquids or solids with liquid oxygen are very powerful explosives but are unsuited for military use, for example in airplane bombs, because of the fact that the liquid oxygen has such a high rate of evaporation that it cannot be sealed up within a bomb, and if a bomb loaded with such a mixture is vented it loses the liquid oxygen so rapidly that the bomb becomes inert before it can be dropped.

It is apparent from the foregoing discussion that the great distinction between explosives and combustibles is that the former possess a greater *concentration* of energy, and release their energy much more rapidly than do combustibles.

In the case of an explosive used for blasting or for fragmenting a high explosive shell or bomb, it is not possible to calculate what percentage of its total energy is expended in doing useful work.

In mining, it is desired to break down rocks or other material from place, in the form of fragments of suitable size, the size depending on the use to which the material is to be put. Thus, for coal, a minimum proportion of fine material is desired; for hard ores which subsequently must be crushed for treatment, large lumps are not wanted. In quarrying building stone, fragmentation is to be avoided as much as possible, large blocks being desired.

In the case of explosives used as bursting charges for shells, it is generally desired that the shell be disrupted into many fragments of such size and projected at such velocity as to have the maximum destructive effect against personnel, aircraft, or other target. In the case of larger shells a maximum blast effect, rather than fragmentation, is desired.

It is, therefore, apparent that disruptive or blasting explosives have many widely differing applications and must produce a large variety of results. There must therefore be many different types, each possessing its own distinct properties. An explosive suitable for use as a bursting charge for high explosive shells would be entirely unfit for quarrying building stone or mining coal. The principal factor which determines the suitability of an explosive for a given purpose is its brisance, a factor depending on energy concentration or density of the explosive, and on its rate of detonation.

The actual efficiency of an explosive used for mining or quarrying or for fragmenting a shell might be calculated with some degree of approximation if means were available for determining the energy required to break the rock or the shell into fragments of a given size, but such a calculation would be of questionable accuracy. One authority has estimated that nitroglycerin on detonation exerts a total pressure of 210,000 lbs. per square inch and that only 14% of its total energy is employed in doing useful work such as shattering or displacing rock, the remainder being lost as heat, sound, etc.

Similarly, in the case of a detonator used for producing the detonation of a larger charge of another explosive, it is impossible to estimate what part of the total energy of the detonator is exerted in

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setting up an explosive wave in the main charge, and what part is expended in bursting its container and doing useless work.

With propellants, however, the problem is much more simple. A charge of smokeless powder in a gun possesses a total energy which may be expressed in terms of the total number of calories evolved on explosion. The purpose of this powder charge is to propel a projectile from the gun at a prescribed velocity. The problem is, therefore, to determine what portion of the original potential energy of the powder charge has been transferred to the projectile in the form of kinetic energy at the instant that it leaves the muzzle.

In an article published in 1913 by C. Cranz,* an attempt was made to calculate the energy balance in the case of the powder charge for an infantry rifle.

The powder charge (weighing 3.2 grams) had a calculated total energy content of 2762 calories (about 860 cal. per g.), or, expressed in mechanical terms, 8459 foot-pounds, i.e., energy sufficient to raise 8459 pounds a height of one foot.

Cranz's calculations showed the following approximate distribution of this total energy content of the powder charge as it performed its mission of propelling the bullet from the rifle:

Muzzle energy of bullet due to its forward movement	905	calories
Muzzle energy of bullet due to its rotation	4	"
Recoil energy imparted to rifle	3	"
Absorption of heat by barrel	620	"
Energy expelled from muzzle in the form of hot gases, sound, etc.	1230	"
Total	2762	"

The above summary shows that only about one-third of the total potential energy of the powder charge was actually expended in imparting forward velocity to the bullet. In this illustration, the 905 calories representing muzzle energy may be expressed as about 2,700 foot-pounds. It is interesting to compare this with the calculated value of about 92,600,000 foot-pounds for the muzzle energy of a 2000 pound projectile as it is propelled out of the muzzle of a 16-inch gun at a velocity of 1800 feet per second by a smokeless powder charge of more than 800 pounds. The time required for the projectile to attain this muzzle energy (i.e., to travel the length of the barrel – over 60 feet), is about one one-hundredth of a second. But the accuracy-life of the 16-inch gun is only about 100 rounds, or about 1 second of actual work. The powder for these 100 rounds would cost probably $30,000. On the other hand, a 100-horse-power steam engine would require about 45 hours to do the same number of foot-pounds of work, at a fuel cost of probably less than $20.

Let us consider the energy of the projectile when it reaches its target, rather than its energy when it leaves the muzzle of the gun. In the case of the infantry rifle referred to above, at a range of about 1200 yards, the energy of the bullet has fallen to only about 10% of the original energy at the muzzle of the rifle. In other words, the energy expended by the bullet in striking a target at a range of 1200 yards is less than 3.5% of the total energy contained in the smokeless powder charge.

In the case of larger weapons, the efficiency of the projectile is much greater.

Cranz (see above) calculated that the projectile from a 12-inch naval gun, weighing 980 pounds, leaving the muzzle with a velocity of 2700 feet per second, has a muzzle energy of 110,000,000 foot-pounds. If the gun is elevated at an angle of 40 degrees, the shell will reach a maximum height of about 7 miles and have a range of 20 miles. On reaching the end of its flight after 95 seconds, it will have a remaining velocity of 1300 feet per second and its striking energy will amount to about 20% of its original muzzle energy.

It is apparent from the foregoing discussion that propellant explosives are relatively poor sources of energy, even when the projectiles which they drive out of the gun actually strike the target at which they are aimed. As a matter of fact, only a small percentage of fired projectiles hit the target, the great majority striking the ground at points where they do no damage. If we consider also that a large percentage of bombs of all sizes dropped from airplanes miss the targets for which they are intended and merely make plenty of noise and tear big holes in the ground or make big splashes in the ocean, we can readily realize that war is exceedingly wasteful of the vast amount of potential energy contained in the explosives actually consumed in battle.

*C. Cranz, Zeit. fur Elektrochem. 19, 731-8 (1913).

A BLAST OF 13 TONS OF TNT GOING UP TO SHATTER THE ROCK OF A NEW QUARRY

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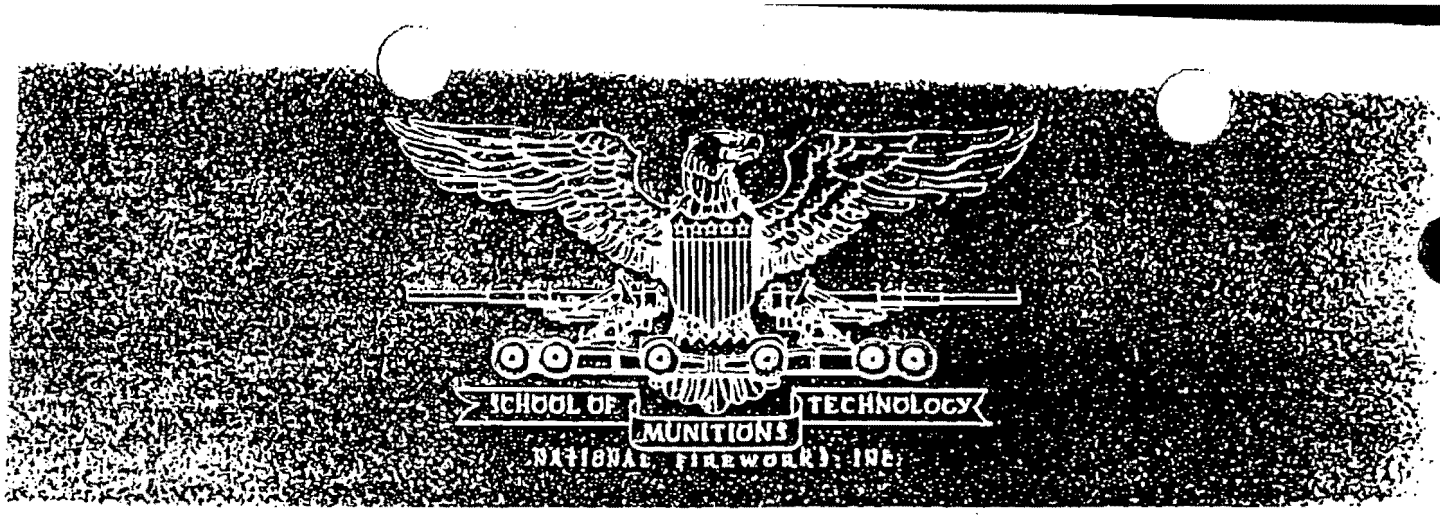

TRAINING MANPOWER FOR MUNITIONS

The School of Munitions Technology

THE imperative need for training manpower applies to the production elements as well as to the fighting forces. With this principle in mind, Mr. E. V. Babbitt, Executive Vice-President of National Fireworks, Inc., began to plan for a School of Munitions early in 1942—a rare example of foresight which resulted in the first school of its kind in America. It was his thought to develop a progressive training program which would bring into the battle of production the maximum power of his whole organization of ammunition loaders, then numbering some seven thousand workers in five plants and about to expand into an army of twenty thousand working in thirteen plants.

His first step was to secure a director with a background of experience in civilian education and army personnel training. Walter H. Lillard was appointed director in February, 1942, and a board of trustees was organized to assist in developing the principles of training. In addition to Mr. Babbitt and Colonel Lillard, the board includes C. W. Wannen, Vice-President and General Manager, General Daniel Needham, General Counsel of the Corporation; David Black, General Plants Manager; and Tenney L. Davis, Ph.D., Director of Research. Under the guidance of this board, a comprehensive program was launched in March, 1942, which soon began to gain momentum and power.

Vestibule Training

In the School of Munitions the first opportunity to train a new employee comes during the so-called vestibule period which follows immediately the various employment arrangements. Many of the workers are about to join the assembly lines where the various kinds of shells, bombs and grenades are loaded. Lessons to these recruits are centered in accuracy, thoroughness, safety and speed. Others have assignments in such departments as Traffic, Maintenance, or Administration where they do not often come into close contact with the actual munitions. But all of them are made to understand at the outset that their assignment is a very essential one and that they will share in the fight for democracy during every hour of their service.

LT. COL. WALTER H. LILLARD, A. G. Res.,
Director of the School of Munitions.

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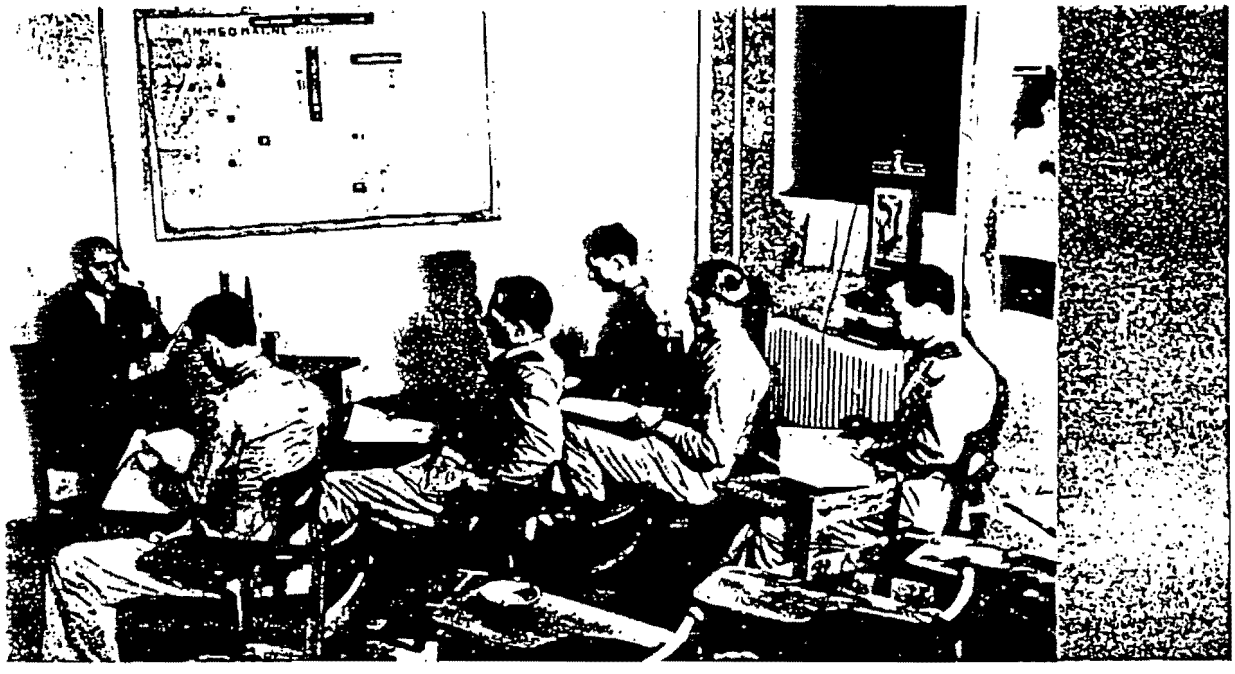

NAVY OFFICERS assigned to duty in Advance Bases study ammunition under Lt. Col. Charles G. Frost, Eng. Ret

Next comes instruction about safety and eternal vigilance—a respect for the hazards of loading munitions, but no fear of the job. Thus the rumors the employees so often hear outside the plant are killed at the start. The new recruits are shown the different types of munitions which the Company assembles. Company rules are explained. Safety precautions and anti-sabotage are stressed. The disloyalty of the Monday morning absentee is made very clear. After this vestibule training is completed the new employee is ready for the lines.

Visual

Through the use of a portable 16 MM sound projector, the School maintains constant contact with the workers and proceeds with a regular program of moving pictures. In order to reach all three of the shifts, this part of the training goes into action twenty-four times each week. The most popular pictures are those which take the audience into the combat zone where they can actually see the deadly effect their ammunition has against the enemy.

Training the Supervisors

During the first months of loading ammunition in many of our American plants each foreman took over a small sector of the production front, was given a meager amount of information from his superintendent, and then had to develop his production team by a system of trial and error. There was a trading of ideas back and forth, coming from the usual surge of Yankee resourcefulness; and somehow or other production got under way. Here was the obvious beginning point in the development of the School of Munitions at National Fireworks.

All of the group leaders who had any kind of supervisory assignment were organized in classes, averaging about twenty, and began attending weekly meetings where they could have presented to them ways and means of improving their efficiency. Some of these meetings were devoted to lectures followed by question periods; others were conferences in which a foreman with a good idea concerning some phase of his work could share it with the others. For lecturers there were experts available in the organization who were successful in presenting their own subjects to these groups.

War Training Courses for Employees

One of the best features of the whole program reaches all grades of the organization—assembly line workers, foremen, and administrative officers. This has been developed in the form of evening classes during two periods: the first period extended from October, 1942, through May, 1943; the second period began in October, 1943, and will extend through May, 1944.

During the first period the program here was sponsored by the United States Office of Education under the general heading of *Engineering, Science,* and *Management War Training Courses*. The faculty consisted of instructors from Northeastern University and from our own staff. Classes in the following subjects were conducted:

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CLASS INSTRUCTION in 20 MM Oerlikon Anti aircraft Gun, under Instructor Paul Stiga

Cost Accounting
Engineering Drawing
Explosives and Ballistics
Foreman Training
General Chemistry
General Mathematics
Methods Engineering
Office Machines
Production Planning and Control
Secretarial Skills

The enrollment list contained 191 students. As transportation became more difficult during the winter months attendance fell off, but 83 succeeded in completing the work and qualifying for certificates. The most successful classes in holding attendance were Explosives and Ballistics, General Chemistry, and Foreman Training.

Training for Post-War Assignments

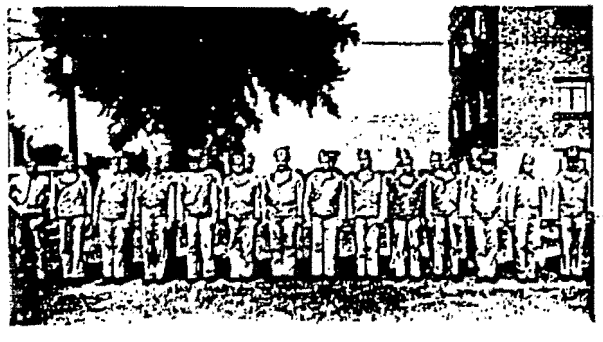
The second period of evening courses at the School began in early October of this year after our management had agreed to subsidize an educational plan which would build up the assets of our employees at present and also prepare them for post-war opportunities. In setting up this very generous plan the management here was looking beyond the war horizon with queer vision and constructive problems. Loading shells is very definitely a war assignment. When peace comes our production soldiers like the members of the armed forces will be demobilized and available for new jobs. That is why our School of Munitions was authorized to set up a generous program of study.

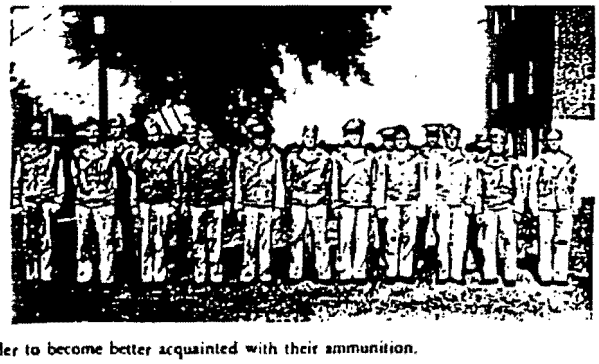
Some of these courses are being conducted by the College of Business Administration, Boston University, and the other courses are under our own instructors as during the first period. There are 177 students enrolled. The curriculum includes the following courses:

Auto Mechanics
Auto Maintenance
Business Fundamentals
Explosives
Round-Table Studies on Post-War Conditions
Sales Presentation and Business Correspondence
Spanish
Stenography
Typing

The School as an Aid to the Armed Forces

At the time of the School's founding in February, 1942, it was planned to develop from the National Fireworks executive personnel a faculty of munitions experts whose experience might be placed at the service of the Armed Forces. In August, only six months after





U. S. MARINES attend the School in two platoons in order to become better acquainted with their ammunition.

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the establishment of training courses for plant supervisors and workers, the program was expanded to begin the schooling of Navy officers in Ordnance.

First to be trained was a group of ten Navy officers who were preparing to go on duty in similar Ordnance plants as inspectors. They were given three weeks of intensive training, which combined actual close-up observation of loading with lectures and conferences by the heads of departments and their lieutenants.

Next to report for duty here, in September, was a group of sixteen young women who had been selected by the Chemical Warfare Service of the Army to be trained as inspectors in various plants which are making incendiary bombs and grenades. This class was given three weeks of careful training with the supervision of the resident C.W.S. officers under Major Chenery Salmon. The third class to report consisted of four Navy officers, who were trained, like the first group, for duty as Ordnance plant inspectors. This group studied during the last week of October and the first week of November. In December came the fourth class numbering twenty-seven young women to be trained as inspectors in the Chemical Warfare Service projects.

Having established a reputation of merit in training inspectors, the School was contacted in January by the Personnel Section of the Navy Ordnance branch and asked to train officers for duty in the Advance Bases about to be established on the shores of the Seven Seas. Instruction began at once and has continued regularly from January, 1943, to the present time.

The actual time allotted for their training at the School of Munitions is two weeks, as there are other Schools which they are scheduled to attend before and after. Naturally the administrative and teaching personnel of the School feel that this is a real privilege, and they have entered into the training program with enthusiasm. The first class of five officers reported for two weeks of intensive study beginning on January 4th, and they soon demonstrated the fact that they had been carefully selected for the responsible mission ahead. They were very keen about the opportunities offered by the School faculty to become well informed concerning the loading, inspection, storage and handling of various kinds of Navy munitions, such as the 20 MM, the 2 Pounder, 40 MM, the 50 Caliber, Incendiary Bombs, Grenades, and Military Pyrotechnics. Fuze Mechanics and Demolition are also regular parts of the curriculum. Twenty-three classes totalling one hundred and eighty-three officers have taken this training up to November, 1943.

The Marine Corps has been served by the School through a course of lectures and demonstrations arranged for the battalion stationed at the Naval Air Base at South Weymouth, Massachusetts. When it was learned that these soldiers of the sea were on duty so near the School, and that they were eager to learn more about their ammunition before going overseas, the facilities of the School were made available at once on a time schedule arranged by their commanding officer. Most interesting to the Marines are the 20 MM Round and the Oerlikon cannon. Classes of twenty-five Marines come to the School once a week for eleven weeks. One hundred and four certificates for completion of the course have been issued to Marines from this base.

CLASS 23, U. S. Navy Officers.

NAVY enlisted men's class at School.

STUDENT MARINES help dedicate the Honor Roll.

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MANUFACTURE OF MAGNESIUM POWDER

At the West Hanover Plant of National Fireworks, Inc.

by WILLIAM MELVIN CLARK

SEVERAL months before our entry into the War, when the need arose for magnesium powder for use in tracer bullets, flares, etc., National Fireworks stood ready to undertake the manufacture. We had what amounted to a prior knowledge of the art, or a prior acquaintance at least, for we had manufactured powdered aluminum during the first World War. For that purpose filing machines had been designed, and machines in which bars of aluminum were hammered until the metal was reduced to powder. The latter method was found to be inapplicable to magnesium, but the filing machines were satisfactory—and machines are now being used for filing magnesium which operate in the same general manner as the machines of twenty-five years ago designed for use with aluminum.

The filing machines consist of horizontally-rotating cylinders covered with coarse files bent to conform to the surface and fastened on with screws. These are turned by a constant speed motor at a rate which may be adjusted by means of gears according to the sharpness of the files. The magnesium is received in the form of cylindrical bars, 1.3" in diameter. A strong frame above the file mill holds three rows of pipes, radially disposed with respect to the horizontal cylinder, in such manner that the ends of the magnesium bars inserted in these pipes rest against the files and are held in place by their own weight and by any additional weights which may be inserted in the pipes on top of them. The files thus remove shavings from the ends of the rods, cutting them across the grain of the metal.

The magnesium rods which are received at the plant have been made from ingots by extruding at a temperature of about 750-800°F. Pure magnesium melts at 1204° F. (651° C.). The temperature at which the bar stock is extruded is considerably below the melting point of magnesium and evidently, also, below the temperature of recrystallization (annealing temperature) of the metal. The bar stock has the qualities of a metal which has been cold-worked. The crystals appear to be oriented in the direction of the length of the bar, and this property, as might be expected, is reflected in the properties of the shavings which are filed from the end of the bar.

The magnesium filings fall into drawers which are copper lined and electrically grounded. Indeed, from this point on, all of the machines which handle the magnesium powder are electrically grounded, and every precaution is taken both to prevent the flying about of magnesium dust and to prevent the accumulation of static electricity by which the magnesium might be ignited. The drawers or bins underneath the file mills and the receptacles into which the magnesium falls

FILE MILL. Note the drawers, with handles, bottom center of the picture. Above them, electrically grounded covers made of canvas and wire screening for ventilation. At the top, weights standing in the pipes, which hold the magnesium bars against the file.

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from the screens and hammer mills are enclosed by canvas in order that dust from them may not circulate in the room. The file mills have been studied for the purpose of determining the best speed of rotation, the best weights to place upon the magnesium bars, the best temperatures of operation, and so forth. At the present time, each file mill produces about 300 pounds of magnesium filings in a 24-hour day.

The material from the files is screened through a 4-mesh screen which removes slugs, bar ends, and very coarse slivers. It then goes to the hammer mills. These are Fitzpatrick mills, chosen because of their size and safety of design, and have been equipped by this Company with water jackets and air regulators, with aquastats to control chamber temperatures, and with devices for controlling the rate of flow of the air and for shutting off the machines in case of excessive temperature rise. The chips or filings are fed into the hammer mills from elevated hoppers at a rate of about one pound per minute, and thence, after being pounded, they pass through a slotted screen into containers from which they are emptied again into the hoppers which supply the hammer mills. After two passages through the hammer mills, the magnesium powder is screened and separated into the various grades which are blended for the production of the finished lots. Coarse material which does not pass through the screens, is returned for two more passages through the hammer mills, then screened again, and so on. It has been found that eight times through the hammer mill gives the maximum production of fine powder.

The chips, filings, or shavings which come directly from the file mills are the fluffiest of any and have the lowest apparent density. Hammering of the material makes it more dense. It is therefore necessary to determine the apparent density of each batch of material from the screens, and then to calculate the proportions in which the several batches must be blended to produce material which conforms to the Army or Navy specifications for granulation and density. The product is shipped in 100-pound lots in hermetically sealed metal drums from which all dampness is rigorously excluded.

A portion of the magnesium grinding plant at West Hanover.

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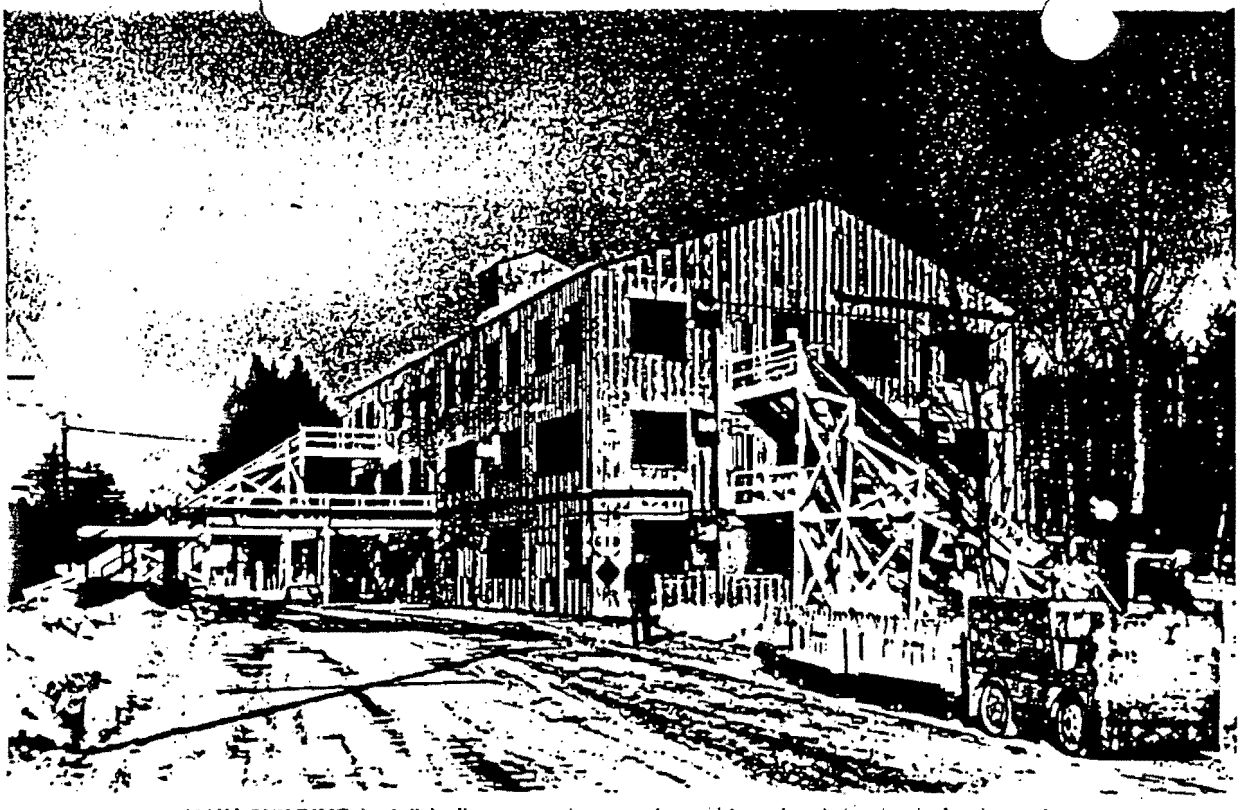

MAIN BUILDING in shell loading group, where amatol, a widely used explosive, is mixed and poured. Extraordinary safety precautions are taken here. Note chutes for quick evacuation of building in case of emergency.

SHELL LOADING and BEECH HILL

A Modern Munitions Plant Built-to-Order for This War

by MAJOR C. P. T. KAFFKE

THE modern shell loading and assembly plant, known within the National Fireworks organization as "Shell Loading and Beech Hill," was built-to-order for this war.

In August, 1940, representatives of the British Government suggested that National Fireworks would be the logical organization to design, build and operate a high explosives plant for them. This proposal was based on the experience and record of the company during World War I in loading small arms ammunition, and, since then, the production of various types of pyrotechnic loadings for the U. S. Army.

The decision to build such a plant was reached after several meetings with the British representatives, at which the type of shells to be loaded and the approximate daily schedule of production was determined. In these discussions it was proposed that this new plant should embody, in a moderate scale, the most modern features of design and operation known to British and American military technicians. It was to be built-to-order for this war, and to be put into effective operation at the earliest moment.

The problem of acquiring a suitable site for a project of this nature for immediate use was solved by the availability of a six-hundred-acre tract of flat and rolling land within a mile of the original National Fireworks plant. As soon as the decision to convert this site was reached a hectic period of negotiation, surveying, and title search began, in order to co-ordinate the individual parcels held by a large number of owners. While this survey was being conducted, the size and design of the buildings and the general layout of the plant were being worked out on paper, and the equipment specifications written. Since the largest part of the equipment and fixtures of a high explosives plant are not commercially available in ready-to-use form, the engineering detail involved was accomplished at high tension.

As soon as practicable the field-work on the site was begun and carried on at fever pitch. The terrain consisted of the widest variety of contour and cover — plains, hills, gullies, meadows, woodland and swampland. The business of co-ordinating paper plans and actual locations required days of exacting foot-work and observation. The ideal

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layout on paper had been attained—but its translation into practical sites entailed many shifts in plan. The mysterious underground meanderings of the swampland were found to interfere seriously with many pre-arranged foundations. Soundings often showed chosen spots to be veritable bottomless pits, and every compromise in re-location would throw out carefully worked out zones and present numberless new problems for re-thinking. Meanwhile the work of clearing, draining, and road-building was extended all over the tract with armies of men and machines seemingly overlapping one another.

Ground for the plant buildings was broken on November 1, 1940—and on March 1, 1941, the first shell was poured—four months to construct and implement a plant layout of more than half-a-hundred buildings. Maximum production was achieved three weeks later—the result of painstaking personnel organization and planning which had been carried on simultaneously with the construction period.

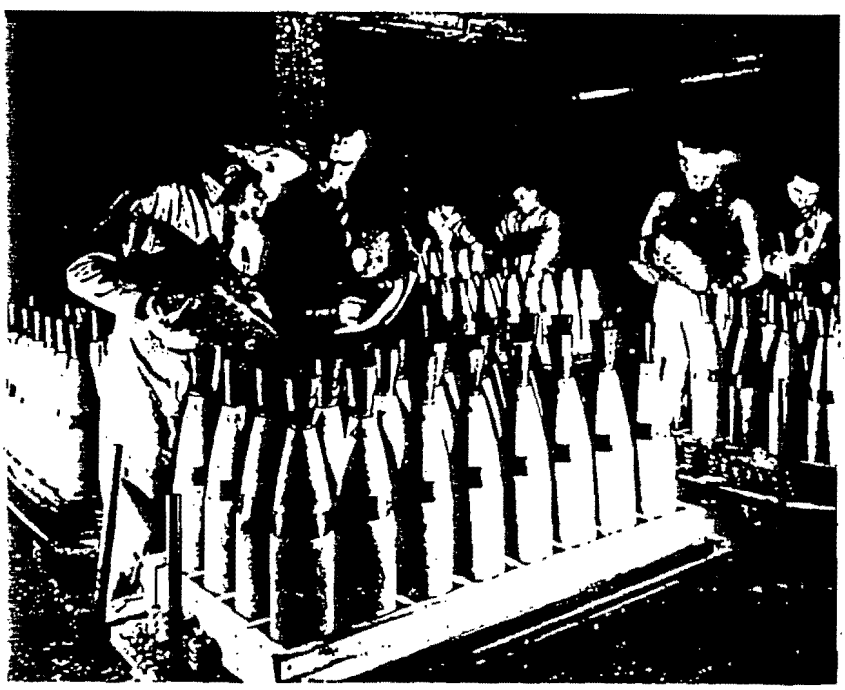
The first shells poured were for the British Government, and were sent to Africa. Some of these were used in the first siege of Tobruk during which the British African Army reduced the strong enemy defenses and took the city from the Italians. Shells of the second type loaded here found their way both to Russia and to Africa and were used with devastating effect against enemy personnel and tanks.

Somewhat later, when the swiftly-changing pace of modern warfare brought into use by the Nazis' more heavily-armored tanks, this type of munition lost its usefulness and was discontinued.

A third type of ammunition for use against high-flying aircraft went into production here, following this change in materiel. It is interesting to note that the plant layout specifically designed at the outset for the loading of large-calibre shells could be so readily adapted to a totally different type of loading. Many of the construc-

MELTING TNT, a yellowish powder, used in making amatol. Workers wear coveralls and paper caps for protection against TNT dust

PRE-HEATING AMMONIUM NITRATE before blending with TNT.



TNT TOPPING. Conical pouring cups provide the necessary excess to make up for shrinkage when the TNT cools.

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tional features of the plant proved to be so functionally basic for high explosive handling that it could serve the new purposes as ideally as those for which it was originally designed.

This type of anti-aircraft loading uses a sensitive point-detonating fuze that is capable of functioning on contact with a 9-oz. millboard, but is "bore-safe" inasmuch as it will not function until it develops rotational speed. Because only a very small percentage of anti-aircraft projectiles actually hit a plane, and therefore create an appreciable battle hazard to friendly personnel as they return to earth, these projectiles are fitted with self-destroying elements. These elements also serve as a tracer which shows the direction of flight and assists the gunner in finding his target. In addition to the loading of the projectile, tracer, primer, and fuze, it is necessary to weigh and bundle the cordite which is used as a propellant. The safety factors which were embodied in the original plant are equally necessary for these later operations, and the areas for the storage of large quantities of high explosives and finished products located remotely from the manufacturing buildings have proved of great advantage.

This ammunition is fired at a great number of rounds per minute when in use, and is assembled as a complete round. The assembly buildings are large enough to permit an assembly routine in which the components going into the complete round may enter one end of the building in proper sequence, and the completely-finished and packed round emerges from the other end, ready to be placed in freight cars or aboard ships.

After the war, when military secrets of today may be cited in terms of millions of pounds of high explosives used and tons of shells handled, the production record of this modern munitions plant, "built-to-order" for this war, may make interesting reading for the public, as well as for ordnance and explosives experts.

LOADING 75 MM. SHELLS into box car for shipment. Each crate contains 12 shells. Crates are strongly braced in car to prevent jarring movement during transit.

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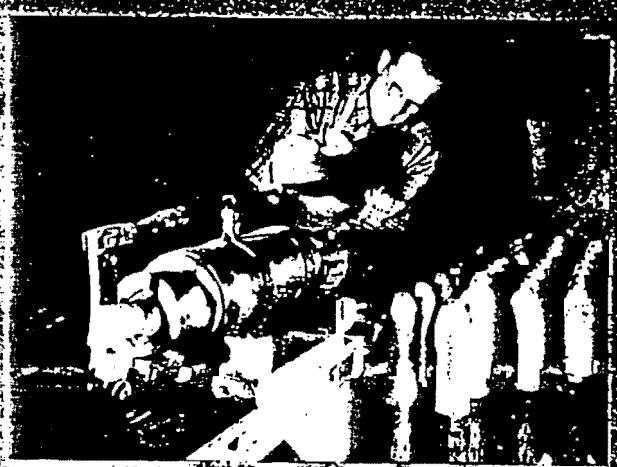
PACKAGING 75 MM COMPLETE ROUNDS



CHAMBER GAUGING 75 MM CO. FEETE ROUNDS

TRANSPORTING 75 HOWITZER SHELLS

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EARLY INCENDIARIES

THE *Pirotechnia* of Vannoccio Biringuccio (1540) has now for the first time been translated completely and published in an English version.

A review of the English translation of Smith and Gnudi is published in the book review section on the succeeding pages.

It is the earliest printed work which covers the whole subject of metallurgy. Its tenth book constitutes what is probably the first printed treatise on fireworks for war and for recreation. The present importance of incendiary bombs makes it interesting to see how they were used in Biringuccio's time, to examine what he had to say about them four hundred years ago. The advantages to be gained by using them were at that time surprisingly similar to the advantages to be gained from them today. Our interest in incendiary bombs, we must also admit, is heightened by the pleasant glow of satisfaction which we experience because of our having loaded the famous bombs which General Jimmy Doolittle dropped on Tokio. The Secretary of the American Institute of Mining and Metallurgical Engineers has kindly given us permission to reprint portions of Smith and Gnudi's translation of Biringuccio's *Pirotechnia* along with some of the pictures, reproduced from the original woodcuts.

The reader will see that flame projectors, incendiary grenades and projectiles, and sticky incendiaries, which remain attached to a suit of armor until the wearer is forced to remove it, are no new things under the sun.

Chapter V:

How Fire Tubes Should Be Made for Defending or Assaulting Batteries or Gates, for Burning Supplies, or for Festivals.

Fire tubes are commonly made in order to frighten horses or to harm enemy soldiers, but although fire issues from them, they do not cause much damage because they cannot be used at a distance. If you wish to use them, you are not able to approach close to the enemy, for if there is anyone who is afraid, he does not let you approach nor does he come near you until he sees that they have finished burning. Thus, in short, the assault with this is one that is seen beforehand, and for which there is always time to decide on some action in defense. It is indeed true that they are beautiful things to see and when the name "tubes of fire" is heard it terrifies those who do not have a defense ready. When four, six, or indeed ten or twelve of these are put in the hands of as many courageous and united men, they are surely good in forcing passage on a guarded bridge, or in entering or holding a gate, road, or other narrow place. They serve also for setting fire to dwellings or the enemy's supplies, carts, bridges, and all those things in the service of the enemy that are easily set on fire. They would also serve well to lay waste a land. Above all, they are good in naval battles.

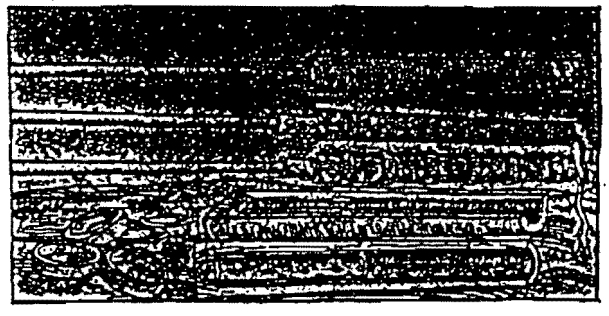

Figure 80. Large fire tubes reinforced with wire and bands, and a lined wooden tube serving as a light gun.

Chapter VI:

The Method of Making Metal Balls Which Burst in Many Parts, for Shooting on Armies Lined Up in Battle.

The good and lofty men of intelligence are constantly discoverers of many beautiful things, because of their kindness or because they are driven by necessity. Either they shorten the method of making them after they have seen them, or they think how they can be increased in power or how they can be used for various effects in addition to the one intended by the inventor. Certainly all the effects described to you in this Tenth Book derive from gunpowder. When so many properties and so much strength were observed in this, it was thought that by enclosing it in some strong thing that had the power to resist it, gunpowder would produce a marvelous effect. And thus they made a tube of bronze or iron which they closed with a wooden plug. They applied fire, and when they saw how forcefully this plug issued they thought of making one that would come out and strike in order to destroy things. They made an instrument of bronze or of iron and put some powder and a round stone inside, and called it a spingard. Developing then from this, various sons were born, both small and large ones and of various shapes depending on the opinions or desire of the masters or of the princes who had them made.

Not yet satisfied with the great harm that they caused in shooting stones, they found a way of making balls of iron, as I have demonstrated. Not yet satisfied even with these, in order to injure men more than the aforesaid ones do, the good men of intelligence have thought of making those hollow balls of metal, and have given them a way of bursting into many pieces so that each piece may strike a blow. And whereas, with the shooting of an ordinary ball with a gun only one arrived among the people, this ball that breaks in pieces is equivalent to many. Thus they proceeded to make these hollow balls of metal

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and filled them with strong powder through a little hole. The fire is introduced with a fuse when they are shot with a gun or launched in some other way by men. Thus the powder-that is inside ignites on arriving and, since it has no escape, bursts the ball into many pieces among the enemy.

I have seen two kinds of these. One is made hollow merely by casting in the ordinary way, employing a core of moulding clay made exactly round with a strickle. Over this a covering is applied of tallow or wax or the whole thickness is formed of clay, and this is turned down with an iron tool to leave as much thickness as you wish it to be in metal, after it has been moulded in halves in moulding clay or in boxes with river sand baked for casting in powder, as is done for small bells.

Alternatively, you can do this by making a pattern of wood or lead and moulding from that. Likewise you could mould the core with the same powder in order to do it more quickly. In moulding, make its little iron pieces project for holding the core in the middle. They could also be moulded in plaster of Patis and cast in wax to that thickness which you wish them to be in bronze. To make the core, they could be filled inside with plaster of Paris, ashes, and liquid clay or burned young ram's horn.

Now having made your gates and vents and the supports for the core in whichever one of these ways pleases you most, cast them in a brittle material, that is, copper strongly corrupted with tin, or cast iron. Finally, take out the clay of the core through the little hole that you left there, and, when empty, fill the balls through this hole with fine powder when you wish to use them. In shooting them, they are shot more forcibly with a gun or with a ballista and with greater safety for whoever has to shoot them. In the hole you have left put a fuse of cotton prepared with saltpeter, sulphur, and gunpowder as I have taught you in another place. This should be just long enough so that when ignited it may introduce fire in the powder at the time that you wish. When ignited, the ball will break in many parts, as you can understand since it is not a material capable of resistance, and every part spreads out hither and yon, driven with a very great violence.

Figure 81. A battery of guns discharging small fire tubes among cavalry.

Chapter VII:

Methods of Making Tongues of Fire to Be Tied on the Ends of Lances like Squibs.

In order to defend batteries or to make a stratagem at night in making an assault it is useful to tie certain tubes of paper on wooden forms to the ends of the lances of the cavalry, or on the ends of the pikes of infantrymen. These are made in the form of rockets or squibs, half a *braccio* or more long, and are full of coarse gunpowder in which are mixed pieces of Grecian pitch, sulphur, grains of common salt, iron filings, crushed glass, crystalline arsenic, and the like. Their very shape gives a hold at the foot, and they should be well packed and full. Then, having put in a good fuse and turned the fire-emitting end toward the enemy and having tied it well to the lance or pike, at the proper time cause them to burn as you wish. From the thing made in this way you will see issue a fearful very hot tongue of fire more than two *braccia* long, full of explosions and horror. This works much better if used when the weather is mild or when you are aided by the wind. This thing serves very well in battles at sea as well as in its effects on land.

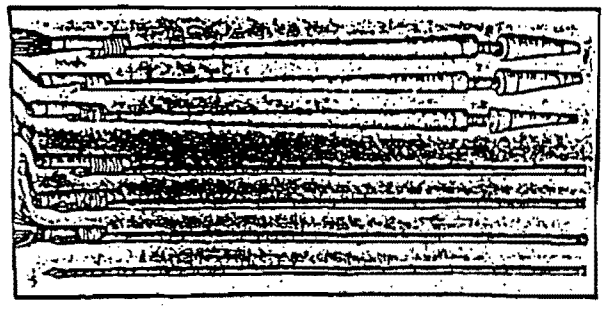

Figure 82. Lances and pikes with small fire tubes attached.

Chapter VIII:

The Methods of Preparing Fire Pots and of Making Balls of Incendiary Composition to Be Thrown by Hand.

There have always been in this world men of such keen intelligence that with their discourse they have been capable of infinite and various inventions that are as beneficial as they are simultaneously harmful to the human body. Wherefore, from day to day, we see unfolded before our eyes some of these that greatly astound our minds, and we remain so stupefied that when we think of them we are not able to control our faculties for some time, both from considering by what necessity or purpose these men were goaded, as well as from contemplating the profound subtlety of their discoveries, which, in truth, are such that they are awarded the greatest commendation by noble minds. By following their counsels and with their aid, there have been some astute and clever captains who have had certain pots or balls of earthenware carried by their infantry, expressly filled with compositions of powder or other unctuous liquors disposed to ignite easily. When they meet the enemy in battle and come up close to them, they try to strike vigorously with these in the first assault in an effort to throw them into disorder and to make them give way by breaking them up and drawing them out of formation. The smoke is harmful, but the fire very much more so.

These are made in this way. Take the number of vessels that you have to make — it does not matter whether they are raw or baked as long as they are well freed from the moisture of the clay — and fill them a little more than half full with coarse gunpowder which has mixed in it pounded Grecian pitch and at least a third of crushed sulphur. Then pour in a covering a *dito* thick of strained pig fat mixed with powder. This keeps it from falling out when it is thrown and

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keeps the fire slower until it reaches the enemy. When this has been made, open up the pig fat a little at one side when you wish to throw it and put in a little fuse or a little good powder and apply fire, holding it in your hand until you see that the fire has taken hold well. Then throw it, choosing your time.

A liquid composition is also made in a kettle in which are put pork fat, petroleum oil, oil of sulphur, live sulphur, doubly refined saltpeter, aqua vitae, Grecian pitch, turpentine, and some coarse gunpowder. Having liquefied everything well over a fire, stir it thoroughly with a stick so that it may be well incorporated, and proceed to fill all the pots or vessels that you have with this composition in the desired amounts. Then put a layer of good gunpowder over them so that they will ignite easily when desired, and let them stand. Use them when you wish, throwing them with slings, or tied with ropes or iron wire like a whip handle, or in other ways of throwing by hand.

With this same composition you can also fill certain linen cloth sacks. These are wrapped with ropes and are shaped like balls. They are shot from iron *cerbottana* like the balls from fire tubes. You could also smear this composition on everything that you wish to burn easily, like gates of earthworks, wooden bridges, carts, munitions, ramparts defending batteries, and similar things, for it is inflammatory material and, when inflamed, it penetrates and maintains a strong fire. You could also bind this at the end of the iron on the pikes of foot soldiers by filling with it a purselike bag, made for carrying the fire among the enemy or any other place at which you wish to throw so that it may ignite and burn.

Figure 83. Fire pots with slings, and incendiary arrows.

Chapter IX:

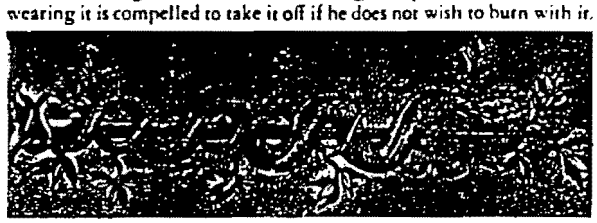
The Manner of Compounding Various Incendiary Compositions Which Are Commonly Called Fireworks.

Every dry thing that burns easily and multiplies or maintains fire by its own intrinsic nature can be put into an incendiary composition and various effects are produced. Some of these things are mineral combinations, like sulphur or its oil; some others, hot, dry, and subtle substances, like saltpeter; and some are unctuous things, like fats and oils of any kind; while some serve because of dryness, like pith and wood. Some of these things are natural and some artificial.

But now I set aside the search for these differences in their composition. This is what I have found among all the ancient and modern things that I have been able to seek, and first, back in the time of Alexander the Great, Marcus Graecus, who was perhaps the inventor or a great experimenter and practicer of such things, writes of many of them. I have chosen some among these, and one is this: In order to make it, he took Grecian pitch, alchitran, live sulphur, tartar, sarcocolla, niter, and petroleum oil, one part of each, and, in addition, a double amount of quicklime. He mixed it all with oil of egg yolks. Having put it in a well-covered and closed vessel of glass or glazed earthenware under warm manure, he left it for a month. Then, having liquefied it over a slow fire, always keeping the vessel well closed, he finally put this liquor in hollow sticks, in little pots, or in vessels expressly made, all with a little fuse fitted in the middle. If I should have to do this, I would say that a little gunpowder should be put in, which should give beginning to the fire so that it would ignite more easily.

I have also found that another fire is made. For this sulphur is taken, or oil of sulphur if it is possible to obtain, petroleum oil or some rock oil, juniper oil, very well-refined saltpeter, and for one part of each of these five parts of asphalt; in addition, taki goose or duck fat, pure black pitch, varnish, pulverized dove's dung, and enough aqua vitae to cover all the aforesaid things. Then it is put in a glass vessel under warm manure for twenty-five to thirty days, after the mouth has been sealed with some wax. Then it is put on a slow fire so that it may all incorporate better. With this composition hollow sticks are then filled or pots and similar vessels to be thrown by hand. In addition, also, take a ball of stone with a ring in the middle to which is attached a rope of one or one and a half *braccia*. On this ball put pieces of tow or linen well soaked with this composition, smearing them well. Then light the fire, swing it around by hand until you feel that it has entered its flight with all the force that it can be given with this motion, and release it. They can also be thrown with ballistas as the ancients used to do or, if desired, with guns as the moderns do. In the latter you can throw not only the ball made of this composition but also one of stone in which an iron ring is fitted and well fixed. To this ring is attached one or more pieces of washed and baked rope that has been very well soaked in this composition. Or if you do not wish to attach ropes, make a little sack of thick heavy cloth and fill it with this composition and attach it to the stone with the ring described, and shoot it with whatever instrument pleases you most. By putting the material in a sack that has the shape of a ball, as above, it can also be thrown with a sling or with a pike that has a hollowed piece of wood or iron bands fitted to the point so as to hold it; as you swing this, the sack comes out and takes the path that you intend it to.

Another incendiary composition is made by taking liquid varnish, oil of live sulphur, oil of egg yolks, oil of turpentine, juniper oil, linseed oil, and petroleum or rock oil, and further, half of the amount of the composition of oil of aqua vitae, and also enough fine powder of dry laurel to thicken the whole, with an equal amount of saltpeter. All these things are put together in a narrow-mouthed vessel of glass or of glazed earthenware that is very well closed with wax so that it does not breathe. Then it is kept in putrefaction in warm manure for three months and shaken four or six times every month. Then, having brought this composition to this point, when you wish to use it you must grease that thing or put some of it in that vessel where you wish the fire to operate. This fire is such that it ignites at once when fire is applied with gunpowder or a fuse; and it is inextinguishable until either the thing or the composition itself is wholly consumed. If it is thrown burning on armor it makes it so glowing hot that whoever is wearing it is compelled to take it off if he does not wish to burn with it.



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BOOK REVIEWS

THE PIROTECHNIA OF VANNOCCIO BIRINGUCCIO. *Translated from the Italian with an Introduction and Notes by Cyril Stanley Smith and Martha Teach Gnudi, Publication Sponsored by the Seeley W. Mudd Memorial Fund. New York: The American Institute of Mining and Metallurgical Engineers, 1942. xxvi, 476 pages. Illustrated. 19.2 x 26.6 cms. Price $5.00 net.*

This is the first complete English translation of the earliest printed work which covers the whole subject of metallurgy. It describes not merely the smelting of metals by the action of fire but also the casting of bells and of cannon, the making of coins, the ores from which the metals are obtained, other minerals and the chemical substances procurable from them, the assaying of ores, the construction of furnaces, the uses and applications of fire in carrying out chemical operations, particularly distillations, and fireworks for entertainment and for war. The book is handsomely bound and beautifully printed, on cream-colored paper, with wide margins — one thousand copies by Carl Purington Rollins, Printer to the University, at the Printing-Office of the Yale University Press, in July, 1942. A Foreword by Harvey S. Mudd is followed by an Introduction which comprises an essay on the Life of Biringuccio by M. T. G., accounts of the Background of the *Pirotechnia* and Its Place in Metallurgical Literature by C. S. S. and of the Editions of the *Pirotechnia* by C. S. S., and Remarks on the Translation by M. T. G. Appendix A reproduces Figures from other sources illustrative of Biringuccio's descriptions, Appendix B discusses Weights and Measures, Appendix C is a List of Editions of the *Pirotechnia*, and Appendix D is a Bibliography.

Biringuccio's *Pirotechnia*, first printed at Venice in 1540, was the earliest of the four great classics of metallurgy. The second, Agricola's *De re metallica* was first printed at Basel in 1556. The two authors were contemporaries, and were known to each other, for Biringuccio acknowledged that he secured certain information on silver ores from Agricola's earlier work on mining, *Bermannus*, 1530, and Agricola admitted that he "refreshed his memory" from Biringuccio's book but actually lifted from it, without further acknowledgment, Biringuccio's accounts of the distillation of mercury and of sulfur, of the making of glass and of steel, of the recovery by crystallization of saltpeter, alum, salt, and vitriol, and of less important matters. Of the other two great classics of metallurgy, the *Aula Subterranea* of Lazarus Ercker was first printed at Prague in 1574, and the *Arte de los metales* of Alvaro Alonzo Barba a full century after Biringuccio at Madrid in 1640. All four retained their authority until the new chemistry of Lavoisier made it desirable to have new descriptions of the chemical substances and processes.

Biringuccio (1480-1539) acquired his knowledge of mining and metallurgy by travel in Italy and Germany and by practicing these arts in various executive positions which he secured either directly or indirectly through the good offices of the Petrucci family of Siena to which family he was loyally devoted. He travelled in Germany before 1507 and again between 1526 and 1529. In 1529 he cast a huge culverin for the Florentine Republic. In January and February, 1531, he served as one of the Senators of Siena, and in 1535 he succeeded the famous Baldassare Peruzzi as architect and director of the Opera del Duomo. During the years, 1531 to 1535, he was also employed at different times to cast arms and construct fortresses for Pier Luigi of Parma, Ercole d'Este, and the Venetian Republic. At the time of his death, before April 30, 1539, he was head of the papal foundry and director of papal munitions.

The *Pirotechnia* exhibits its author as a practical man, broadly informed but not scholarly, acquainted with theories and able to evaluate them, urbane, and possessing an active sense of humor. That he was a genuine chemist, cognizant of the fascination of his science but not deluded by it, is evident from his remarks about alchemy.

"Nevertheless, even though the goal of this art were emptiness, as many believe, it is indeed so ingenious a thing and one so delightful to students of natural things that they cannot forego the expenditure of all possible time, labor, and expense. Besides the sweetness offered by the hope of one day possessing the rich goal that this art promises so liberally, it is surely a fine occupation, since in addition to being very useful to human needs and convenience, it gives birth every day to new and splendid effects such as the extraction of medicinal substances, colors, and perfumes, and an infinite number of compositions of things. It is known that many arts have issued solely from it; indeed, without it or its means it would have been impossible for them ever to have been discovered by man except through divine revelation."

His attitude toward theories, his general kindliness and lack of dogmatism, are manifest from the manner in which he concludes his discussion of the noise which guns produce.

"Thus, for these reasons, and for no other (since I do not know how to understand any other), I believe that the noise and great sound heard in shooting guns arise. Now, if these reasons of mine have weight with you or with others, I shall be glad to have told them so that you may have this information, but if they do not have this effect, you will pardon my meager philosophy, which extends no farther, and accept my desire to try to give you what I can."

His clear-headedness and sense of humor are further indicated, among many examples, by his account of the "Girandoles, Which Were Once Customarily Used in Some Tuscan Cities for Magnificent Display for Public Festivities on Solemn Feast Days."

"If you have never seen a girandole, as perhaps you never have, you may understand what it was when you hear it named. Indeed, although it was a beautiful thing and cost much money, it was a useless thing to make. Nevertheless those times were truly golden, that is, they had much gold to spend for things without consideration of the expense, and fireworks had no other purpose than amusement and endured no longer than the kiss of a lover for his lady, if as long ... Then these figures were placed wherever they seemed most fitting, by arranging the combinations of vessels above vessels or other attached things with which they attained a height of thirty or forty *braccia*, depending on the knowledge or the desire of the master or of whoever paid the bills."

The tenth book of the *Pirotechnia* describes the preparation of saltpeter and gunpowder, subterranean mines, bombs, grenades, flame throwers, incendiaries, and display fireworks, and constitutes one of the earliest printed treatises on military and civil pyrotechnics. Smith and Gnudi make a very important observation about it, an observation which we have not seen noted before, namely, that it is this book which Peter Whitehorn translated in large part and, with Biringuccio's illustrations, reproduced without acknowledgment in his book, "Certain waies for the orderyng of souldiers in battelray ... and moreover, howe to make saltpeter, gunpoulder and diuers sortes of fireworkes or wilde fyre", London, 1560 (2nd ed., London, 1588). The credit

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which has been given to Whitehorn in discussions of the history of black powder ought rather to be given to Biringuccio.

Biringuccio's black powder formulas (parts by weight) are indicated below in the table where the percentage compositions are also set down for readier comparison.

	For heavy guns	*For medium guns*	*For arquebuses and pistols*	
Saltpeter	3 (50.0%)	3 (66.6%)	10 (83.3%)	13½ (79.4%)
Charcoal	2 (33.3%)	1½ (20.0%)	1 (8.3%)	2 (11.8%)
Sulfur	1 (16.6%)	1 (13.3%)	1 (8.3%)	1½ (8.8%)

The first of these compositions is the slowest, the last is the liveliest and best, and the others are intermediate between the two. While we now regulate the speed of our powder by varying the size of the grain, Biringuccio, it seems, regulated it by varying the composition. He described a wet-mix method which he considered to be the best and quickest way of making gunpowder. His descriptions of girandoles and pyrotechnic wheels are the earliest with which we are acquainted.

TENNEY L. DAVIS

FIREWORKS IN THE SIXTEENTH CENTURY

MANUAL OF EXPLOSIVES, *Military Pyrotechnics, and Chemical Warfare Agents. Composition, Properties, Uses. by Jules Bebie. Ph.D., Consulting Chemical Engineer, Professor of Chemical Technology, Washington University. The Macmillan Company, New York, 1943. xvi+171 pages. 14.0 x 21.3 cms. Price $2.50.*

This book is improperly named as a manual. It is a dictionary of terms commonly used in the field of explosives and war chemicals. The book is obviously an emergency effort handicapped by a shortage of time and necessarily incomplete. The author gives us a frank statement on this point: "With no claim for completeness, an earnest effort has been made to list all of the more important explosives, explosive mixtures, modifying and addition agents, and particularly those which are actually being used or which have been used as far back as World War I."

The dictionary contains 536 entries of which 157 describe explosive materials, either single substances or mixtures, 7 refer to explosive devices, 80 to non-explosive components of explosive or pyrotechnic compositions, 8 to pyrotechnic compositions or devices, 36 to chemical and accessory materials, 37 relate to chemical warfare agents and devices, and 211 are for synonyms, trade names, Army or Navy nicknames, abbreviations, etc., and supply cross references to other entries under which the materials in question are described. The Preface (4½ pages) is followed by a section (2 pages) on Nomenclature, Arrangement, and Abbreviations, and by an Introduction (14½ pages) which contains a brief account of the history of explosives and includes a Chronology (8 pages) of the principal events in that history. The latter supplies a valuable background of information. The alphabetical list is followed by a Bibliography, which includes books, bulletins, manuals, catalogues, and articles in periodicals; also by a list of 39 recent patents.

WALTER H. LILLARD

THE RIFLE IN AMERICA, *by Philip B. Sharpe, with an introduction by Julian S. Hatcher, Lieutenant-Colonel, United States Army. 641 pages. Illustrated. William Morrow and Company, 1938. $10.*

Here is *the* definitive work on American rifles, a truly encyclopedic volume covering the history of the rifle in America and American riflemakers from the Colonial musket down through the Army's new Garand semi-automatic. Anyone interested in shooting, whether novice or oldtimer, will find hours of absorbing reading in this book. Mr. Sharpe has performed a real service for riflemen in collecting so much heretofore scattered material and assembling it interestingly in a single volume.

The author writes as an expert on this subject. Philip B. Sharpe is both a firearms enthusiast and technician. Guns and ammunition are his hobby as well as his life work. He is, among other things, Firearms Editor of Outdoors Magazine, Firearms Technical Adviser to the American Fiction Guild, the author of "The Complete Guide to Handloading" and other books, and a collector of old guns. Mr. Sharpe knows rifles from muzzle to butt plate and writes in an easy, anecdotal style that makes interesting reading even when his subject matter inclines to be technical.

"The Rifle in America" gives actual details of every standard rifle, both sporting and military, ever made in this country. At least, if any are omitted this reviewer is not aware of it. The rifles are divided into makes and the models are listed and described chronologically, which makes for easy reference. In describing the various guns, Mr. Sharpe gives detailed information about each — its dimensions, caliber, operating mechanism, and so forth, and tells both its faults and virtues. In tracing the development of the modern rifle, Mr. Sharpe shows how changing conditions, such as the growing scarcity of game and war experience, have brought about changes and improvements in weights, calibers, sights, materials and ammunition. The history of the great arms manufacturing companies is given, with many anecdotes about the gun geniuses who founded them.

For the beginner, there are chapters on how to choose a gun and ammunition, how to care for a rifle, and pointers on good shooting practice. There is an exhaustive chapter on the military rifles of World War I, and interesting speculations on the future of the American rifle.

In a comprehensive appendix, the author describes and illustrates all the modern American cartridges and gives tables of ballistic specifications and barrel dimensions.

The excellent illustrations in "The Rifle in America" add greatly to its value as a reference work. There are many photographs of historically interesting old guns, as well as diagrams of the operating mechanisms of many modern rifles. The only fault that this reviewer could find with this book is the index, which might be more comprehensive. But this is a small fault to find with a study so admirable in every other respect.

KENNETH H. THOMPSON

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THE CHEMISTRY OF POWDER AND EXPLOSIVES *Tenney L. Davis. Volume I xi + 216 pages. (Illustrated). John Wiley & Sons, Inc., May, 1941. Price $2.75. Volume II v + 298 pages. Paginated continuously with Volume I. (Illustrated). John Wiley & Sons, Inc., April, 1943. Price $3.00.*

At the beginning of the last war the American chemical profession found itself potentially great, but still dependent upon the chemical knowledge of other nations. Today the balance is in our favor, and the trend is emphasized by the many comprehensive and authoritative texts and publications of American chemists.

THE CHEMISTRY OF POWDER AND EXPLOSIVES is such a work. For the first time there is a text now available in English which deals fully and in detail with the chemistry of powders and explosives and which contains facts that are difficult to find elsewhere, and much material never brought together before: The book is a definite contribution to its field, for it not only gives the facts of explosives but explains them. The material is already digested and assimilated, and does not offer to the reader a mass of facts and data which he, himself, must make intelligible. It is both fortunate and unfortunate that the book is written at a time when it is necessary to rigorously exclude any material which is, or which may be considered, confidential.

An interesting sidelight on this scientific text is the highly interesting and readable style in which it is written, although there are many sections where a person, not trained in chemistry, might have his own opinion.

Chapter I on the "Properties of Explosives" begins with a definition of an explosive which might well be used in all future texts on this subject, for it not only defines but has no exceptions. "An explosive is a material, either a pure single substance or a mixture of substances, which is capable of producing an explosion by its own energy." Most definitions require that large volumes of gas be produced on explosion, but although this is generally the case, it does not include some exceptions, such as cuprous acetylide which detonates without producing gas. In place of the usual classification of explosives into "Low Explosives" and "High Explosives," there is given a more rigorous classification into Propellants, Primary, and High Explosives, with the distinguishing characteristics of each class. The chapter is an unusually clear and original account of the nature of explosions and the physical properties and testing of explosives. The reader will frequently find humor tucked away, as it were, among the pages of this serious text. The author says that, "It seems unnecessary to define an explosion, for everyone knows what it is—a loud noise with the sudden going away of things from the place where they have been."

The following chapter on "Black Powder" includes a unique and fascinating account of the history of this explosive. The historical importance of the discovery of this explosive is elucidated in the following fashion, which is repeated here, for it brings out forcibly why our present civilization is dependent upon explosives:

> "Three great discoveries signalized the break-up of the Middle Ages: the discovery of America, which made available new foods and drugs, new natural resources, and new land in which people might multiply, prosper, and develop new cultures; the discovery of printing, which made possible the rapid and cheap diffusion of knowledge; and the discovery of the controllable force of gunpowder, which made huge engineering achievements possible, gave access to coal and to minerals within the earth, and brought on directly the age of iron and steel and with it the era of machines and of rapid transportation and communication. It is difficult to judge which of these three inventions has made the greatest difference to mankind."

The manufacture, uses and properties of Black Powder are fully described, and included are accounts of blasting powder, ammonpulver, guanidine nitrate powders, Rashig's white blasting powder and Poudre Brugère.

Following this subject is a long chapter on "Pyrotechnics" and is so included because "The early history of pyrotechnics and the early history of black powder are the same narrative." The author discusses Civil pyrotechnics only, since it is the basis for military application. The art which is disclosed in the design and manner of construction of colored lights, signals, lances and flares, may cause one to regret that civil pyrotechnics appears to be on the decline. The chapter contains much material which has not been published heretofore, and the entire subject is timely.

There is nothing in the present literature which is comparable to the chapters on "Aromatic Nitro Compounds," "Smokeless Powder" and "Nitroamines and Related Substances." Each subject and its chemistry has been completely organized and discussed.

Chapters IV to IX embrace a long list of explosive substances with their manufacture, application and modes of behavior. A wealth of information is included on the pertinent facts of their history. Throughout the text are tables and data on lead block and sand bomb tests, drop tests, velocities of detonation, temperatures of explosion, initiating power, solubilities and other chemical and physical properties.

The chapter on "Aromatic Nitro Compounds" begins with a brief summary on aromatic chemistry, the utilization of coal tar and petroleum, and the effects of substituents on explosive strength.

Among the topics interestingly developed in the subject of "Nitric Esters," are the different velocities of detonation of nitroglycerin and nitroglycerin explosives under different conditions of initiation and loading, the subject of frozen dynamite, the contributions of Nobel and the early history of intrated carbohydrates.

The material on "Smokeless Powder" and related propellants is very comprehensive and the classification of colloided nitrocellulose powders, the discussion of stabilizers, gelatinizing agents, hygroscopicity, and flashless charges and powder clarify these otherwise complex subjects. The chapter concludes on Ball Grain Powder.

The last three chapters are on "Dynamite and Other High Explosives," "Nitroamines and Related Substances," and "Primary Explosives, Detonators and Primers." Among the nitroamines are the interesting explosives nitroguanidine, cyclonite, nitrourea, guanidine nitrate and nitrosoguanidine.

THE CHEMISTRY OF POWDER AND EXPLOSIVES is fundamental for it deals with the principles of the use of explosives and the physical and chemical properties upon which these principles depend. In perspective, the author has viewed his subject with realism, for although he concedes the chemistry of these substances to be science, he properly regards the character of each explosive as being individual.

JOSEPH ACKERMAN, JR.

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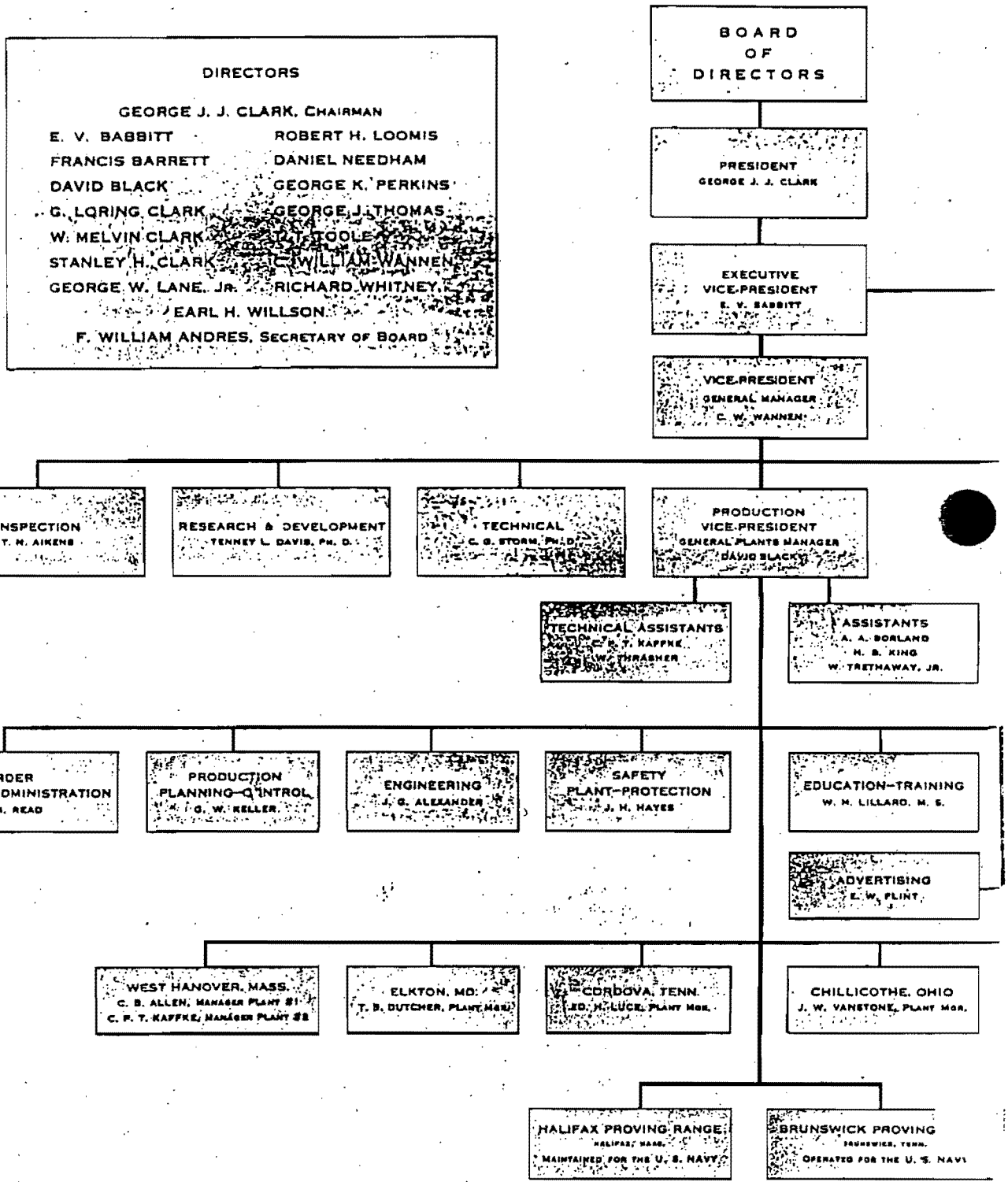
NATIONAL FIREWORKS, INC.

WEST HANOVER, MASSACHUSETTS



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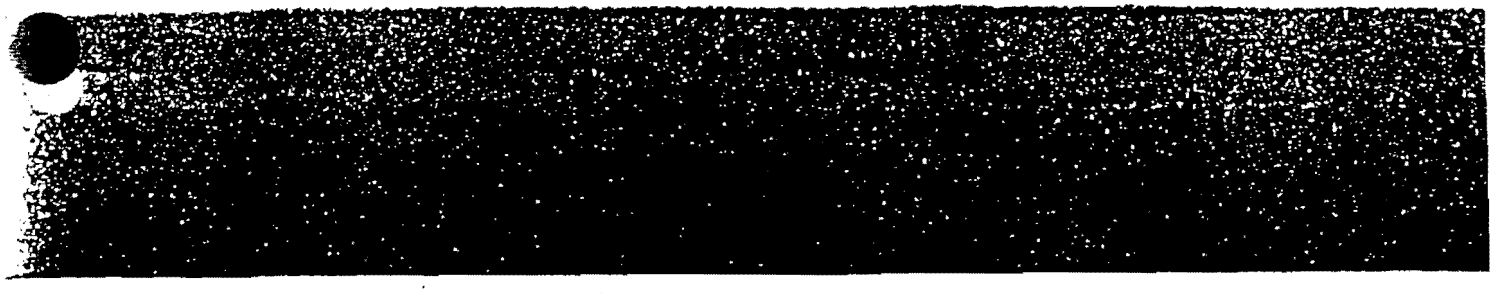


ORGANIZATION CHART

OFFICERS

GEORGE J. J. CLARK, President
E. V. BABBITT, Executive Vice-President
C. WILLIAM WANNEN, Vice-President and General Manager
DAVID BLACK, Vice-President and General Plants Manager
GEORGE W. LANE, JR., Vice-President, Chairman Finance Committee
W. MELVIN CLARK, Vice-President and Director of Purchases
FRANCIS BARRETT, Treasurer
G. LORING CLARK, Assistant Treasurer
DANIEL NEEDHAM, General Counsel

EXECUTIVE ASSISTANTS
W. MELVIN CLARK, V. P.
L. K. LARSON
GEORGE K. PERKINS
H. A. POTSDAM
G. J. THOMAS
T. T. TOOLE
RICHARD WHITNEY
E. H. WILLSON

TREASURER
FRANCIS BARRETT

ASSISTANT TREASURER
G. LORING CLARK

CO-ORDINATOR
GEORGE K. PERKINS
WASHINGTON, D. C.

CONTROLLER
W. J. EDWARDS

GENERAL COUNSEL
DANIEL NEEDHAM
OF THE FIRM OF
SHERBURNE, POWERS & NEEDHAM

RESIDENT COUNSEL
WALTER WHITE

PUBLIC RELATIONS
CAMERON BECK

PERSONNEL
W. G. MARTIN

TRAFFIC—SHIPPING RECEIVING STORES
FRANK LARKIN

MEDICAL
JOSEPH DUNN, M. D.

PURCHASING
HAROLD S. CHASE

METHODS—TIME STUDY
HERBERT WERNER

LABOR RELATIONS
LOUIS J. BRANN

YFIELD, KY.
DKSON, PLANT MGR.

BRISTOL, VA.
H. B. CARTER, JR., PLANT MGR.

MAYS LANDING, N. J.
A. H. BIRD, PLANT MGR.

AMERICAN FIREWORKS
H. L. RAFF, PLANT MGR.

SUBSIDIARIES

NATIONAL PLAYTHINGS
FRED A. WAGE, PLANT MGR.

WAREHAM SHIPYARDS
E. L. GOODWIN, PLANT MGR.

NATIONAL FOUNDRY
JOS. ANDERSON, Manager

12173 FS

GEORGE J. J. CLARK, President and Founder of National Fireworks, Inc., and a pioneer in the manufacture of fireworks and military pyrotechnics.

E. V. BABBITT, Executive Vice-President of National Fireworks, Inc., managing head of the company during its war expansion.

A RECORD OF PERFORMANCE

National Fireworks, Inc.

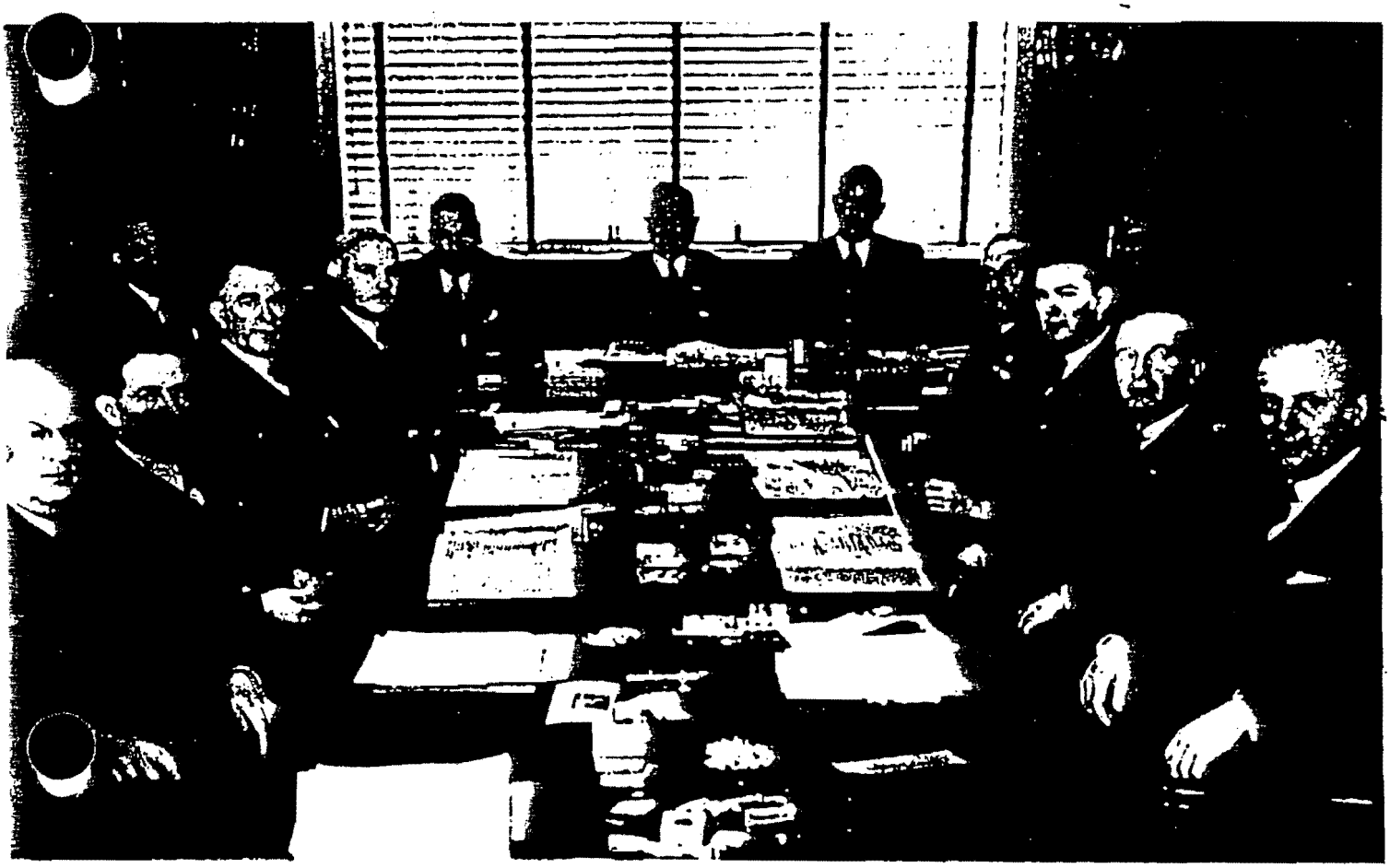
NATIONAL FIREWORKS, INC., was the seventh plant in the United States to win the coveted Navy "E" pennant and Navy Ordnance flag, symbols of Excellence in production for Victory. This award was made on January twelfth, 1942. Since then, the company has been awarded, at six month intervals, the Navy Burgee Pennant with Anchor and Star, the Army-Navy "E" pennant, and four renewal stars. Specifically, these awards were made in recognition of National's record in turning out 20 MM anti-aircraft shells of various types for the U. S. Navy . . . an outstanding performance that is being paralleled in every other department, hence enabling the Navy "E" to fly proudly over all the many divisions of National's war activities.

National Fireworks went to war fourteen months before Pearl Harbor—breaking ground for its first new shell loading plant on November 1st, 1940, and pouring its first shell for this global war on March 1st, 1941, for the British Government, when this plant was put into production. A veteran war plant of World War I, the company was called upon early in this war to convert and expand its plant facilities for total war service, and today it ranks as the largest privately-operated ammunition loading plant, in every field excepting small arms ammunition, in the United States.

It is interesting to note that the site of the company's main plant at West Hanover, Massachusetts, has been historically associated with this Country's wars since before the American Revolution. It is located on a stream along which were the sites of several early iron foundries and forges which manufactured cannon, cannon balls, and anchors for the war-ships of the U. S. Navy, in the Revolution, the War of 1812, and the Civil War. The administration offices are on the exact site of an early cannon foundry mentioned in "The History of Shipbuilding on the North River," by L. Vernon Briggs in 1889, and described as follows:

"About 1710, 'Mighill's Works,' or the 'Drinkwater Iron Works,' were erected here by one Mighill, probably a son of the Rev. Mr. Mighill, who was settled over the South or Second Society in Scituate in 1684, though little is known of him or his business. Tradition says that he manufactured iron from bog

12174 FS



BOARD OF DIRECTORS

LEFT TO RIGHT: Robert H. Loomis, W. Melvin Clark, George K. Perkins, Francis Barrett, (at rear) F. William Andres, Secretary of the Board, Daniel Needham, George J. J. Clark, E. V. Babbitt, (at rear) George W. Lane, Jr., David Black, George J. Thomas, Stanley H. Clark, C. William Wannen. (Directors not in photograph:—G. Loring Clark, T. T. Toole, Richard Whitney, Earl H. Willson.)

GEORGE W. LANE, JR., Vice-President and Chairman of Finance Committee.

C. WILLIAM WANNEN, Vice-President and General Manager.

DANIEL NEEDHAM, General Counsel, of the law firm of Sherburne, Powers & Needham, Boston, Massachusetts.

12175 FS

W. MELVIN CLARK, Vice-President and Executive Assistant.

EARL H. WILLSON, Executive Assistant.

RICHARD WHITNEY, Executive Assistant.

T. T. TOOLE, Executive Assistant.

GEORGE J. THOMAS, Executive Assistant.

LLOYD K. LARSON, Executive Assistant.

ore, which he dug at 'Cricket Hole,' near the Third Herring Brook, and in the low grounds in the vicinity of Dam Brook, where it can now be obtained in moderate quantities. These works have had many proprietors and tradition says again that, during the Revolution, cannon were cast here and carried down to the old fulling mill near the iron foundry and tested, and that Tilson Gould was killed by the bursting of one of these guns, the pieces of which are said to be still lying in the bottom of the old furnace pond."

National Fireworks, Inc., was founded forty-four years ago by Mr. George J. J. Clark, its present President, for the manufacture of Fireworks. It gradually acquired several other plants for the manu-

HAROLD A. POTSDAM, Executive Assistant.

GEORGE K. PERKINS, Executive Assistant.

12176 FS

RANCIS BARRETT, Treasurer.

G. LORING CLARK, Assistant Treasurer.

W. J. EDWARDS, Comptroller.

facture of Fireworks, and for many years maintained complete national distribution, establishing a world-wide reputation for the superiority of its products in this field of commercial pyrotechnics.

During the first World War the company expanded its plant and activities to produce Flares, Signals, and similar Military Pyrotechnics, and was responsible for the development of the Tracer Bullets used in that war, becoming the principal source for that type of ammunition, a fact which in no small measure accounts for the company's early inclusion in the allied munitions program for this war.

The company operates two main plants at West Hanover and seven branch plants located east of the Mississippi River and along the Eastern seaboard, with a combined personnel of about twenty thousand.

Loading ammunition and the handling of explosives required large areas of plant layout, with many small operations buildings properly zoned and safeguarded. The main plant comprises approximately six hundred buildings enclosed in a fenced area of over three hundred acres. The branch plants require similar buildings and acreage, so that it may be seen that the over-all operations of the company have necessitated large building, engineering, and financing programs. To meet the needs of the Government, the company has expended over $6,000,000 on its own account for plant expansion, and in addition $1,000,000 was expended by the British Government. The United States Government has made additional expenditures of about $10,000,000 on government-owned plant facilities, operated by National Fireworks, Inc.

National Fireworks, Inc., was the first private company in the United States to load 20 MM Oerlikon anti-aircraft ammunition, having loaded for the British Government before starting production for the U. S. Government. After the United States entered the war, and the Bureau of Ordnance assumed direction of Navy and Lend-Lease requirements, National Fireworks, Inc., expanded its 20 MM production facilities to meet the progressive needs of the Navy's program in this highly specialized field of loading. Today, in six of its plants, it is carrying the major part of the Navy's 20 MM production program.

As a "loader and filler" of ammunition, National Fireworks, Inc., has executed various contracts for tracer loading ranging from .303 Small Arms Ammunition to 75 MM Armor-piercing Projectiles.

WALTER WHITE, Resident Counsel.

F. WILLIAM ANDRES, Secretary of Board of Directors.

12177 FS

DAVID BLACK, Vice-President and General Plants Manager.

C. P. T. KAFFKE, Technical Assistant and Manager of Main Plant, No. 2.

A. A. BORLAND, Assistant to General Plants Manager

At its Melt Loading Plant it has loaded with both TNT and Amatol projectiles varying from 2 Pounder high velocity complete rounds to the 6-Inch Howitzer, and the complementary loading of boosters and exploder systems as well as smoke boxes, used in this type of loading.

In the field of fuse loading, our plants have executed contracts ranging from the small 20 MM Detonating Fuse up through the 75 MM and 6-Inch Fuses of various types and designs as well as the fulminate and azide detonators used in loading these fuses of a wide range of design.

In the loading and assembling of complete rounds, ranging from 37 MM to 75 MM, National Fireworks, Inc., has employed both Smokeless Powder and Cordite as propellant charges; in conjunction with these complete rounds there has been loaded and assembled the appropriate type and size of Artillery Primer.

National has loaded, and is loading, substantial quantities of the various types and sizes of Incendiary Bombs, Incendiary Grenades, Oil Bombs and Fire Starters.

It has executed special contracts for the development of High Altitude Anti-aircraft Projectiles of the self-destroying type.

In the Pyrotechnic field, National Fireworks has loaded such items as Flares, Ground Signals, Aircraft Signals, Very Signals, and Miniature Practice Bomb Signals.

WARREN THRASHER, Technical Assistant.

HAROLD B. KING, Assistant to General Plants Manager.

WILLIAM TRETHAWAY, JR., Assistant to General Plants Manager.

J. G. ALEXANDER, Chief Plants Engineer.

T. N. AIKENS, Chief Inspector.

M. M. READ, Contract Administration.

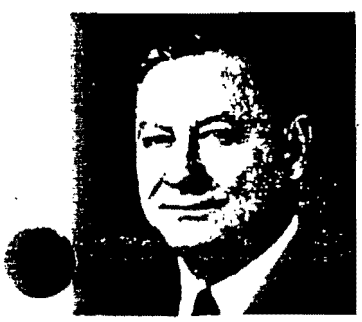
STANLEY H. CLARK, Assistant Plant Manager of Main Plant, No. 1.

12178 FS

CLARK B. ALLEN, Plant Manager of Main Plant, No. 1.

ED. H. LUCE, Plant Manager, Cordova, Tennessee.

ARTHUR H. BIRD, Plant Manager, Mays Landing, N. J.



C. F. COOKSON, Plant Manager, Mayfield, Kentucky.

Another of the Company's principal contributions to the war effort is its development of a highly successful method of grinding magnesium powder, designing and building special machines for this purpose, and becoming one of the largest producers of this vital loading component.

In addition, the Company has available resources and experienced personnel capable of loading and assembling a wide range of types of Artillery Projectiles, Fuses, and HE Aerial Bombs, Detonators of all types, Depth Bombs, and Torpedo War Heads.

At the beginning of the company's expansion for war work, Mr. George J. J. Clark, President and Founder of National Fireworks, Inc., and Mr. E. V. Babbitt, Executive Vice-President, realizing how vast the undertaking might become, speedily assembled a staff of executive, technical, engineering and production experts, many of whom held important ordnance posts during World War I, and others who were at the time actively engaged in ammunition and powder work. This staff of top executives and specialists has been increased as the Company's activities expanded, so that at the present time it numbers about two hundred.

George J. J. Clark, President, and E. V. Babbitt, Executive Vice-President, and C. W. Wannen, General Manager, actively direct the operation of the company.

The Production Department is headed by David Black, Vice-President and General Planrs Manager. The Technical Department is in charge of Dr. Christian G. Storm. The Research Department is headed by Dr. Tenney L. Davis.

The company built and maintains for the use of the Navy a proving range for anti-aircraft ammunition, known as Halifax Range, with a Resident Proof Officer in charge, Commander F. J. H. Dawson, R. N., and an adequate staff.

At Brunswick, Tennessee, the company operates for the U. S. Navy the Brunswick Proving Range, which handles the proofing of ammunition from plants located in the Southern and Middle Western states.

The first unit of expansion in 1940 was the development of Main Plant, No. 2, the Beech Hill and Shell Loading plant, together with an enlargement of the facilities existing at Main Plant, No. 1, the original fireworks plant at West Hanover. Main Plant, No. 1, is managed by Mr. Clark B. Allen and Main Plant, No. 2, is managed by Major C. P. T. Kaffke. All the production units of the company are directed by Mr. David Black, Vice-President and General Plants Manager.

The first branch plant at Elkton, Maryland, began operations on March 3, 1941, only a few days after the start of shell loading in Main Plant, No. 2, at West Hanover. The Elkton Plant specialized in the manufacture of RYG fuses for the British during its first six months of operation, and later was enlarged to handle a substantial volume of loading of anti-aircraft shells. This branch is managed by Mr. Thomas B. Dutcher.

After the entry of the United States into the war, a second branch plant was built at Cordova, Tennessee, near Memphis. This plant began production on March 6, 1942, under the management of Mr. Ed. H. Luce. The Cordova plant loads incendiary bombs, smoke pots and anti-aircraft ammunition.

Five months later, in July, 1942, another branch plant at Mays Landing, New Jersey, went into production on incendiary bomb loading. The Mays Landing Plant is managed by Mr. Arthur H. Bird.

J. W. VANSTONE, Plant Manager, Chillicothe, Ohio.

H. B. CARTER, JR., Plant Manager, Bristol, Virginia.

HENRY L. RAPP, Plant Manager, American Fireworks Co.

THOMAS B. DUTCHER, Plant Manager, Elkton, Maryland.

12179 FS

Meanwhile, at the Main Plant in West Hanover, large facilities for the loading of 20 MM anti-aircraft ammunition had been developed, and the personnel of this parent plant furnished the supervisory personnel which was assigned to later branch plant expansions. The loading of various types of rapid-fire ammunition was undertaken at the Main Plant during this period. Facilities for the loading of incendiary bombs were developed and large scale production commenced. Military pyrotechnic supplies were produced by another division. The processing of magnesium for loading purposes became an important branch of the Main Plant's production.

The increasing demand for large-volume loading of 20 MM Oerlikon anti-aircraft ammunition brought further expansion in the Summer of 1942, and three more branch plants were under construction—plants which embodied in improved form all the successful features developed during the year and a half of pioneering at the Main Plant.

After many weeks of investigation of possible sites and after careful study of local labor supply, these three model anti-aircraft ammunition loading plants were constructed at Mayfield, Kentucky, Chillicothe, Ohio, and Bristol, Virginia. The Mayfield Plant is managed by Mr. C. F. Cookson, and began production on September 22, 1942. The Chillicothe Plant started production October 1, 1942, with Mr. J. W. Vanstone as manager. The Bristol Plant went into production October 15, 1942, with Mr. H. B. Carter, Jr., as manager.

Another branch plant, American Fireworks Company at Randolph, Massachusetts, started production on November 20, 1942. American Fireworks Company produces a vital component part of the ammunition loaded in the other plants. Mr. Henry L. Rapp is President and Plant Manager of American Fireworks Company.

The company's entire staff of experts, its research laboratories, and production facilities at all times have been placed at the disposal of the government to assist in solving technical problems, and special experimental lots of ammunition have been loaded and tested for the Army and Navy on request.

This record of performance will not be completed until the war is over, and many of the accomplishments of research and production in which the company takes pride necessarily will have to remain docketed as confidential until after the war is ended.

WILLIS G. MARTIN, Personnel Manager.

HAROLD B. CHASE,
Purchasing.

GEORGE W. KELLER,
Production Planning Control.

JAMES H. HAYES,
Safety and Plant Protection.

FRANK LARKIN,
Traffic Manager.

DR. JOSEPH DUNN,
Medical Director.

CAMERON BECK,
Public Relations.

ERNEST B. JONES,
Technical Assistant.

HERBERT WERNER,
Methods—Time Study.

12180 FS

LABOR RELATIONS

Collective Bargaining an Established Policy with National

THE inherent rights of employees including that of collective bargaining, relative to hours, wages, and conditions of employment have long been the recognized and established policy of the National Fireworks, Inc.

The creation of a Labor Relations Department is merely another step to insure the fulfillment of the Company's desire for the maximum of understanding and harmony in its relationship with all employee personnel. The establishment of this Department was in no small measure prompted by the fact that during the past three years, the American Federation of Labor has been certified as the bargaining agency in several of the Company's plants located in various sections of the country.

Agreements have been negotiated and in some instances re-negotiated with the Unions involved. Although there were no serious differences between management and the Unions, it soon became apparent that it would be conducive to increased efficiency to set up an agency devoted exclusively to the investigation and adjustment of those grievances, both real and imaginary, which invariably occur.

The current pattern for the disposition of labor problems, through the creation of a Labor Relations Department, has been pioneered by many of the larger corporations of America and is being recognized as a progressive and invaluable measure by an ever increasing number.

Although our sole objective at the moment is the successful prosecution of the War effort (to the end that a speedy and victorious cessation of world hostilities will obtain), we were, in founding this Department, actuated in no small degree by the belief that firmly established industrial tranquillity would lend much to the attainment of our post-war aims in the rehabilitation program which must inevitably follow.

We submit that confidence in the fairness and integrity of management on the part of its employees, is the greatest asset obtainable toward industrial success. The way in which this Department has been accepted by the workers and their faith in its "square deal pledge" is most gratifying. Many unsuspected minor abrasions which could and would become festered sores if allowed to continue have been healed.

A program of education relative to the proper method of immediately adjusting routine departmental incidents by foremen has been inaugurated and is accomplishing results beyond anticipation. Instant disposition of any matter precludes the possibility of it ever reaching aggravated proportions. It is a fact that a great many serious industrial disputes are directly attributable to a failure to expeditiously consider some apparently trivial complaint. Failure to give swift attention is often interpreted as being an affront to the dignity of the employees' representatives. Operating upon the premise that an "immediate decision" is mutually desirable, this department countenances no delay in fulfilling its functions. This fact is known and appreciated by the employees.

It was recognized that in order to fully attain and maintain its desired labor policy would necessitate the selection of personnel for the new department of individuals having a thorough knowledge of employee problems, their causes and remedies, and further endowed with the personality and human characteristics which radiate friendliness and assure respect and confidence. A wide search for men deemed to have the aforementioned qualifications culminated in the selection of Louis J. Brann, former Governor of Maine, universally known as an outstanding humanitarian and able executive; A. F. Young, for many years a national representative of the American Federation of Labor; and Leo F. Caldwell, Esq., long connected with National. These men assumed their new responsibilities the 17th of May, 1943, and immediately initiated a campaign to become acquainted with the employees and their complex problems through personal contact.

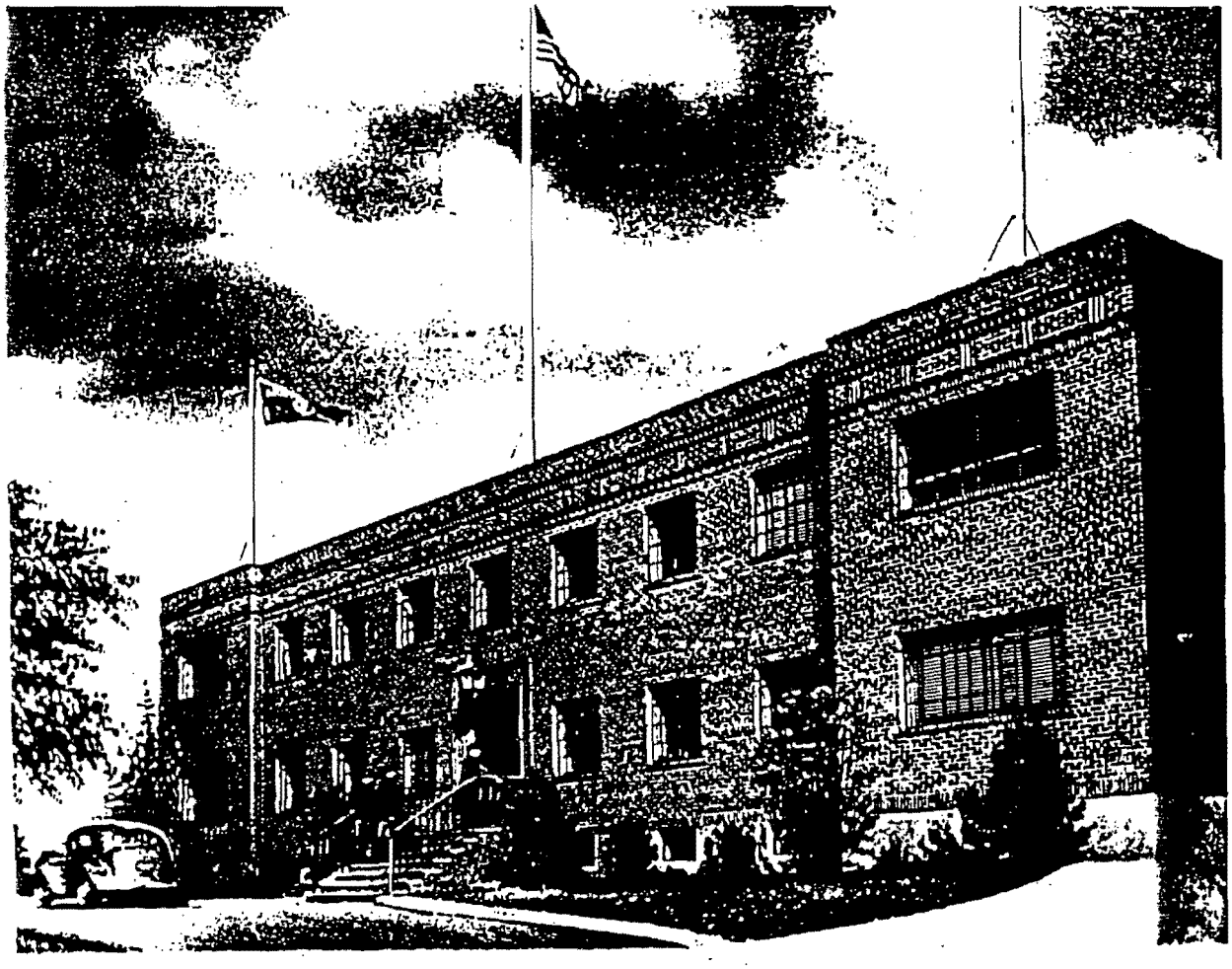
Many hundreds of employees in the various plants are now known by their first names. The workers' reaction to this—surprising to them—familiarity, can be readily visualized. It has instilled in their minds the thought that the Company is not concerned only with their production but is genuinely interested in them as fellow Americans. Regular visitation of all plants at least once every three months as part of our agenda has been very beneficial.

The Company not only is most happy but also proud that the wisdom of creating this Department and its selection of personnel has been completely justified by the results already seen. Absolute confidence in its continuing success is unanimously prevalent.

LABOR RELATIONS DEPARTMENT: Louis J. Brann, Director; A. F. Young, Assistant Director; (standing) Leo F. Caldwell, Attorney.

12181 FS

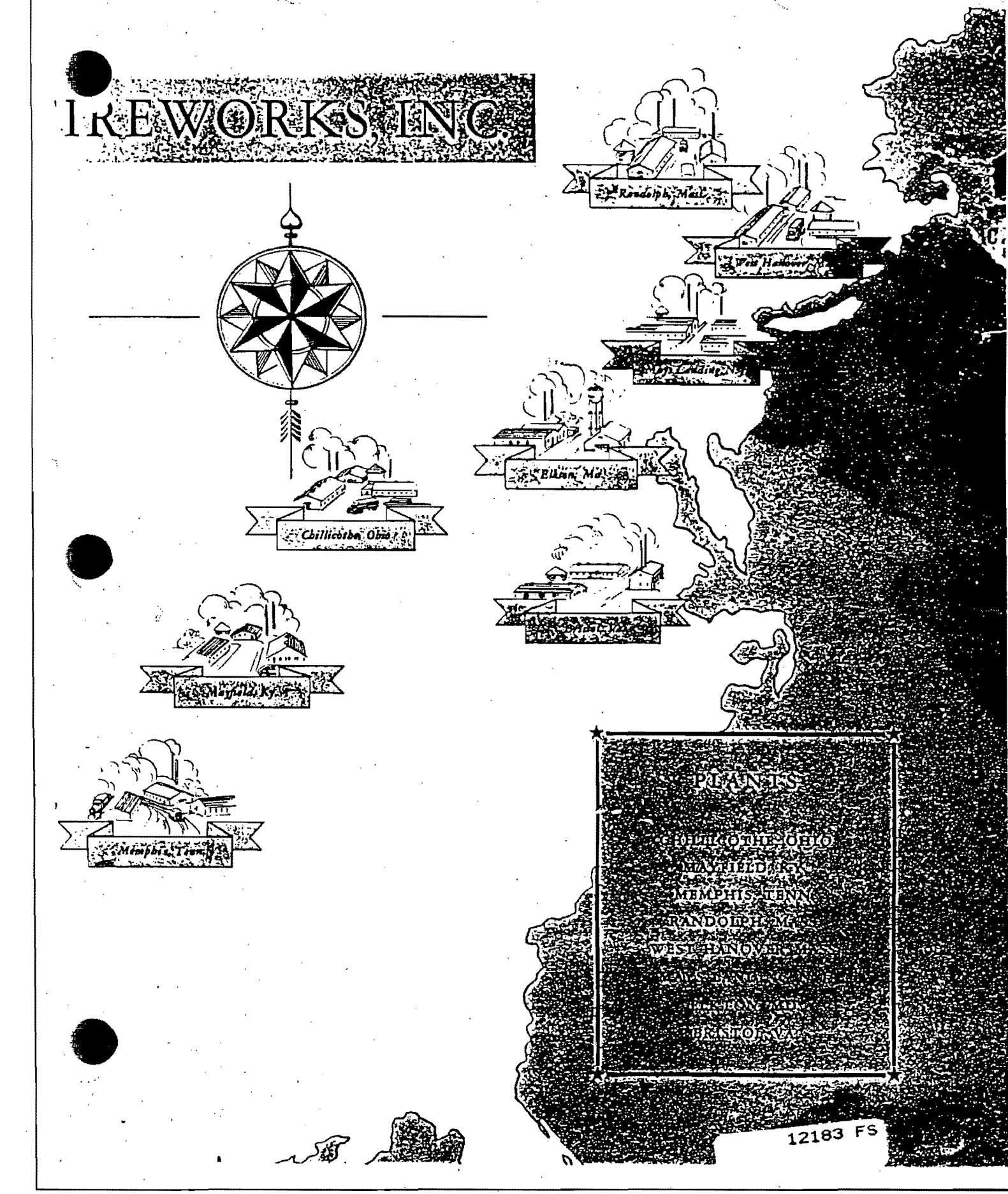
PLANT NETWORK OF NATIONAL



Administration Building, National Fireworks, Inc., at West Hanover, Massachusetts. This building houses the administrative staff, the executive offices, and the School of Munitions Technology. Ground was broken for construction in June, 1942 and the building was completed and occupied December 1st, 1942. It was built on the exact site of a proposed building for similar purposes for which foundations were laid near the close of World War I, but which was never erected. Three other large office buildings nearby supplement the office facilities of this Administration Building.

12182 FS

REWORKS, INC.


Randolph, Mass.
West Hanover, Mass.
Elkton, Md.
Chillicothe, Ohio
Mayfield, Ky.
Memphis, Tenn.
PLANTS
CHILLICOTHE, OHIO
MAYFIELD, KY.
MEMPHIS, TENN.
RANDOLPH, MASS.
WEST HANOVER, MASS.
ELKTON, MD.
BRISTOL, VA.
12183 FS

10902485

NATIONAL FIREWORKS RETURNING TO COUNTY

Leases Space In Former War Plant At Cordova

PRODUCT NOT DISCLOSED

CA 5-1-52

The National Fireworks Co. which owned and operated a large munitions plant at Cordova during World War II, has leased back some 10,000 feet of the plant for a resumption of operations here, T. B. Dutcher Jr. of Security Signals Ins., who handled the lease for the company, said last night.

Mr. Dutcher said National Fireworks will start operations in about 60 days. He added that he was not at liberty as yet to disclose what the company will manufacture.

Small At First

"It will be a rather small operation at first anyway," Mr. Dutcher said, "with only 20 to 25 employes. However, the company has options to lease more space if it is needed."

The 10,000 feet of space leased is in four of the more than 60 buildings which were erected east of Cordova when World War II began.

After the war, National Fireworks closed down its operations and the plant was sold to the Cordova Industrial Development Co. composed of Francis Hickman, publisher of the Cotton Trade Journal, Mr. Dutcher and others.

Made Shells For Navy

Mr. Dutcher indicated he would be the National Fireworks representative here for the time being.

The Cordova plant of National Fireworks originally was opened in March, 1942, and between then and when it closed down in June, 1945, manufactured more than 100,000,000 shells for the Navy.

Wartime manager of the plant was Ed H. Luce, who still lives in Memphis.

CA 5-1-52

W A R R A N T Y D E E D

THIS INDENTURE Made and entered into this 21st day of October, 1946, by and between National Fireworks, Inc., a Massachusetts Corporation, of the first part, and Cordova Industrial Development Co., a Tennessee Corporation, of the second part.

W I T N E S S E T H:

That for the consideration hereinafter expressed, the first party has bargained and sold and does hereby bargain, sell, convey and confirm unto the second party, the following described real estate in Section 2, Range 5, Second Civil District, Shelby County, Tennessee, to-wit:

TRACT NO. 1. The west 65 acres of that part of the J. H. Schram 154.30 acres lying south and east of the Nashville, Chattanooga, and St. Louis Railroad and more particularly described as follows:-

Beginning at an iron stake at the intersection of the south line of the Macon Road and the east line of the N. C. and St. L. Railroad right-of-way; running thence north 89 degrees 58 minutes east along the south line of the Macon Road a distance of 729.88 feet to a stake at an angle in said road; thence continuing along the south line of the said Macon Road south 88 degrees 50 minutes east 454.59 feet to an iron stake; thence leaving said road and running south 0 degrees 06 minutes west 1322 feet to an iron stake in the south line of the J. H. Schram tract; thence south 89 degrees 51 minutes west along the south line of the J. H. Schram tract 3574.7b feet to a point in the south line of the N. C. and St. L. Railroad Right-of-way; thence north 64 degrees 47 minutes east along the south line of said right-of-way 1141.36 feet to a point where said right-of-way curves to the left; thence continuing along the line of said right-of-way along a curve to the left with a radius of 3942 feet a distance of 1780.36 feet to the point of beginning, containing 65.00 acres, being the same tract of land conveyed to the National Fireworks, Inc., by Warranty Deed from John H. Schram and wife, Jennie Poston Schram, dated November 4, 1941, and recorded in Book 1721, page 544, of the Register's Office of Shelby County, Tennessee.

TRACT NO. 2. Also that part of the J. H. Schram 154.30 acre tract lying adjacent to and immediately east of the above described tract and being the east 60.29 acres of the 125.25 acres of the J. H. Schram 154.30 acres lying between the N. C. and St. L. Railroad on the west, the center line of the Grays Creek Drainage Ditch on the east and south of the Macon Road, and more particularly described as follows:-

Beginning at an iron stake in the south line of the Macon Road 1194.7 feet easterly along the south line of said road from the east line of the N. C. and St. L. Railroad Right-of-way, running thence eastwardly along the south line of the Macon Road with the meanders thereof as follows:

South 89 degrees 58 minutes east 1010.25 feet to a stake, south 84 degrees 39 minutes east 499.2 feet to a stake, south 80 degrees 41 minutes east 70.24 feet to a point where the south line of the Macon Road intersects the center line of the Grays Creek Drainage Ditch; thence down the center thread of said Drainage ditch with the meanders thereof as follows:

South 10 degrees 40 minutes east 241 feet to a stake, south 35 degrees 28 minutes west 300 feet to a stake, south 14 degrees 25 minutes west 300 feet to a stake, south 13 degrees 50 minutes east 420.75 feet to a stake in ... Schram's south line 103.3 feet west of an iron stake at Schram's southeast corner; thence south 89 degrees 51 minutes west along the south line of the Schram tract 1519.7 feet to an iron stake; thence north 0 degrees 06 minutes east 1322 feet to the beginning, containing 60.29 acres. Being the same tract of land conveyed to the National Fireworks, Inc., by Warranty Deed from John H. Schram and wife Jennie Poston Schram, dated February 13, 1942, and recorded in Book 1721, page 615 of the Register's Office of Shelby County, Tennessee.

TRACT NO. 3. Also the Edward G. Humphreys 135.69 acres, being that part of the 262 acre tract formerly in the name of Mrs. Marie Allen Austin lying west of the center line of Grays Creek Drainage Ditch and more particularly described as follows:-

Beginning at an iron stake in the west line of the W. G. Allen 640 acre tract 766.72 feet northwardly along said line from an iron stake at the northwest corner of the 378 acre tract conveyed by W. G. Allen to his son Max Allen.

Said beginning point is also the northwest corner of the 100 acres allotted to Elizabeth T. Allen et al by decree duly cut of the 262 acres formerly in the name of Mrs. Marie Allen Austin; running thence north 0 degrees 40 minutes east along the west line of the W. G. Allen 640 acre tract, passing an iron stake in the south line of the N. C. and St. L. Railroad right-of-way at 801.14 feet and continuing across said Railroad right-of-way, passing the north line of same at a distance of 990.24 feet and continuing in all a total distance of 1126.96 feet to the southwest corner of the Benj. Watson 25.7 acre tract which is also the southwest corner of the 100 acre tract formerly known as the W. H. Allen 180

10902487

22

acres; thence north 89 degrees 51 minutes east along the line between the above mentioned 180 acre tract and the W. G. Allen 740 acre tract, passing a point in the north line of the said right-of-way at 86.32 feet and continuing across said right-of-way, passing the south line thereof at 377.78 feet and containing in all a total distance of 5868.24 feet to a stake in the center line of Grey's Creek Drainage Ditch; thence with the center thread of said Drainage Ditch south 13 degrees 58 minutes west 1071.15 feet to a stake at the northeast corner of the Elizabeth T. Allen 100 acre tract; thence along the north line of said 100 acre tract south 89 degrees 59 minutes west 5623.4 feet to the beginning, containing an aggregate of 136.26 acres less 0.57 acres contained in the railroad right-of-way, leaving a net acreage of 135.69 acres of which 0.034 acres is north of the railroad and 135.655 acres is south of the said railroad. Being the same tract of land conveyed to the National Fireworks, Inc., by Warranty Deed from Edward G. Humphreys and wife Bernice A. Humphreys, dated November 4, 1941, and recorded in Book 1711, page 310, of the Register's Office of Shelby County, Tennessee.

The above-described tracts, Nos. 1, 2 and 3, aggregate 260.9h acres.

TO HAVE AND TO HOLD the aforedescribed real estate, together with all the appurtenances and hereditaments thereunto belonging or in anywise appertaining unto the said Cordova Industrial Development Co., its successors and assigns in fee simple forever.

And the said National Fireworks, Inc., does hereby covenant with the said Cordova Industrial Development Co. that it is lawfully seized in fee of the aforedescribed real estate; that it has a good right to sell and convey the same; that the same is unincumbered except for 1946 State and County taxes, which are assumed by the Cordova Industrial Development Co. and that the title and quiet possession thereto it will warrant and forever defend against the lawful claims of all persons.

The consideration for this conveyance is as follows: $10.00 and other good and valuable consideration, receipt of which is hereby acknowledged.

Witness the execution of this deed of conveyance by the duly authorized officers of the said National Fireworks, Inc., this the day and year above written.

(CORP. SEAL) NATIONAL FIREWORKS, INC.,

ATTEST: By C. W. Wannen Treasurer
Walter White Assistant Clerk

STATE OF MASSACHUSETTS:

COUNTY OF PLYMOUTH :

Before me, Walter White, a Notary Public in and for the State and County aforesaid, duly commissioned and qualified, personally appeared C. W. Wannen with whom I am personally acquainted and who, upon oath, acknowledged himself to be the Treasurer of the National Fireworks, Inc., the within named bargainor, a corporation, and that he, as such Treasurer being authorized so to do, executed the foregoing instrument for the purpose therein contained, by signing the name of the corporation by himself as Treasurer.

WITNESS my hand and seal at office in West Hanover, Massachusetts, this 21st day of October, 1946

(N. P. Seal) Walter White
My commission expires: March 6, 1953. Notary Public.

U. S. DOC. STAMPS $132.00

STATE TAX $190.15

STATE OF TENNESSEE:

SHELBY COUNTY

Filed for Registration Nov. 4, 1946 at 4:10 o'clock P.M., and noted in Note book No. 112 Page 53 and was recorded Dec. 1-, 1946. Fee $3.00 Paid.

Francis Hudson
Register
by E. Neil Carey D.C.

THIS INDENTURE made and entered into this 2nd day of November, 1946, by and between Joel C. Massey, and wife, Bertha C. Massey, of the first part, and J. W. Smith, and wife, Lassie W. Smith, of the second part.

WITNESSETH: That for the consideration hereinafter expressed, the first parties have bargained

AO 88 (Rev. 1/94) Subpoena in a Civil Case

10902488

Wolfert
EXHIBIT NO. 1
6-24-97
MICHELLE SYLVIA

Issued by the

UNITED STATES DISTRICT COURT

[redacted]STERN DISTRICT OF MASSACHUSETTS

SUBPOENA IN A CIVIL CASE

V.

CASE NUMBER:[1] 97 10279-MBD

In the Matter of Verified Petition to Take Depositions to Perpetuate Testimony Regarding the Fireworks Site

TO: Hubert H. Wolfert

☐ YOU ARE COMMANDED to appear in the United States District Court at the place, date, and time specified below to testify in the above case.

PLACE OF TESTIMONY	COURTROOM
	DATE AND TIME

☒ YOU ARE COMMANDED to appear at the place, date, and time specified below to testify at the taking of a deposition in [redacted]ove case.

[redacted]OF DEPOSITION	DATE AND TIME
Ramada Inn; Executive Boardroom; 929 Hingham Street, Rockland, MA	06/24/97 at 9:30 a.m.

☐ YOU ARE COMMANDED to produce and permit inspection and copying of the following documents or objects at the place, date, and time specified below (list documents or objects):

PLACE	DATE AND TIME

☐ YOU ARE COMMANDED to permit inspection of the following premises at the date and time specified below.

PREMISES	DATE AND TIME

Any organization not a party to this suit that is subpoenaed for the taking of a deposition shall designate one or more officers, directors, or managing agents, or other persons who consent to testify on its behalf, and may set forth, for each person designated, the matters on which the person will testify. Federal Rules of Civil Procedure, 30(b)(6).

[redacted]OFFICER SIGNATURE AND TITLE (INDICATE IF ATTORNEY FOR PLAINTIFF OR DEFENDANT)	DATE
Attorney for Petitioners	6/16/97

ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER

Christopher P. Davis, Esq., Goodwin, Procter & Hoar, Exchange Place, Boston, MA 02109 - Tel: (617) 570-135

(See Rule 45, Federal Rules of Civil Procedure, Parts C & D on Reverse)

[1] If action is pending in district other than district of issuance, state district under case number.

PROOF OF SERVICE

DATE	PLACE
SERVED 12:45 PM June 17, 1997	1 Catha Lane Hingham, MA 02043
SERVED ON (PRINT NAME)	MANNER OF SERVICE
Hubert H. Wolfert	By leaving in hand with $40.00 witness fee and $6.00 travel fee = $46.00.
SERVED BY (PRINT NAME)	TITLE
Robert S. Barlow	Constable and a disinterested person

DECLARATION OF SERVER

I declare under penalty of perjury under the laws of the United States of America that the foregoing information contained in the Proof of Service is true and correct.

Executed on June 17, 1997
DATE

Robert S. Barlow
SIGNATURE OF SERVER

3 Cove Creek Lane - P.O. Box 276
Marshfield Hills, MA 02051
ADDRESS OF SERVER

Rule 45, Federal Rules of Civil Procedure, Parts C & D:

(c) PROTECTION OF PERSONS SUBJECT TO SUBPOENAS.

(1) A party or an attorney responsible for the issuance and service of a subpoena shall take reasonable steps to avoid imposing undue burden or expense on a person subject to that subpoena. The court on behalf of which the subpoena was issued shall enforce this duty and impose upon the party or attorney in breach of this duty an appropriate sanction which may include, but is not limited to, lost earnings and reasonable attorney's fee.

(2) (A) A person commanded to produce and permit inspection and copying of designated books, papers, documents or tangible things, or inspection of premises need not appear in person at the place of production or inspection unless commanded to appear for deposition, hearing or trial.

(B) Subject to paragraph (d)(2) of this rule, a person commanded to produce and permit inspection and copying may, within 14 days after service of subpoena or before the time specified for compliance if such time is less than 14 days after service, serve upon the party or attorney designated in the subpoena written objection to inspection or copying of any or all of the designated materials or of the premises. If objection is made, the party serving the subpoena shall not be entitled to inspect and copy materials or inspect the premises except pursuant to an order of the court by which the subpoena was issued. If objection has been made, the party serving the subpoena may, upon notice to the person commanded to produce, move at any time for an order to compel the production. Such an order to compel production shall protect any person who is not a party or an officer of a party from significant expense resulting from the inspection and copying commanded.

(3) (A) On timely motion, the court by which a subpoena was issued shall quash or modify the subpoena if it

(i) fails to allow reasonable time for compliance;

(ii) requires a person who is not a party or an officer of a party to travel to a place more than 100 miles from the place where that person resides, is employed or regularly transacts business in person, except that, subject to the provisions of clause (c)(3)(B)(iii) of this rule, such a person may in order to attend trial be commanded to travel from any such place within the state in which the trial is held, or

(iii) requires disclosure of privileged or other protected matter and no exception or waiver applies, or

(iv) subjects a person to undue burden.

(B) If a subpoena

(i) requires disclosure of a trade secret or other confidential research, development, or commercial information, or

(ii) requires disclosure of an unretained expert's opinion or information not describing specific events or occurrences in dispute and resulting from the expert's study made not at the request of any party, or

(iii) requires a person who is not a party or an officer of a party to incur substantial expense to travel more than 100 miles to attend trial, the court may, to protect a person subject to or affected by the subpoena, quash or modify the subpoena, or, if the party in whose behalf the subpoena is issued shows a substantial need for the testimony or material that cannot be otherwise met without undue hardship and assures that the person to whom the subpoena is addressed will be reasonably compensated, the court may order appearance or production only upon specified conditions.

(d) DUTIES IN RESPONDING TO SUBPOENA.

(1) A person responding to a subpoena to produce documents shall produce them as they are kept in the usual course of business or shall organize and label them to correspond with the categories in the demand.

(2) When information subject to a subpoena is withheld on a claim that it is privileged or subject to protection as trial preparation materials, the claim shall be made expressly and shall be supported by a description of the nature of the documents, communications, or things not produced that is sufficient to enable the demanding party to contest the claim.

AFFIDAVIT OF HUBERT H. WOLFERT

I, Hubert H. Wolfert, being first duly sworn, depose on oath as follows:

1. I was born on May 20, 1916, and currently reside in Hingham, Massachusetts. I make this affidavit based on personal knowledge of the facts recited herein.

2. My training and education includes graduating from the University of Pennsylvania in 1937, and management positions such as production supervisor, general manager and president.

3. I was formerly a civilian government employee at the Picatinny Arsenal in Dover, New Jersey from 1937 to 1940. My responsibilities included: technical writer of production work and dispatcher.

4. I was formerly employed by National Fireworks, Inc. ("NFI") and Atlantic Research Company ("ARC") at their manufacturing facility in Hanover, Massachusetts ("Facility"), from 1940 to 1962 and from 1967 to 1969. From 1940 to 1945, I was the Superintendent of Production at the Facility. From 1945 to 1962, I was the Executive Vice President. From 1967 to 1969, I was the Director and Plant Manager.

5. At these positions, I was personally familiar with plant operations including what products were being manufactured, for whom they were being manufactured, the types and sources of raw materials, where supplies were stored, and where and how waste materials were disposed of. I was familiar with the numbers and responsibilities of personnel at the Facility. As part of my responsibilities, I reviewed contracts between NFI or ARC and the various branches of the U.S. military. All of the above were part of my duties.

6. During World War II, specifically, between 1941 and August, 1945, NFI manufactured ammunition products at the Facility for the United States Department of Navy, Bureau of Ordnance ("Navy"), the United States Department of Army, Ordnance Department ("Army"), and the United States Department of Army, Chemical Warfare Service ("Chemical Warfare Service"). During this time, I was the Superintendent of Production. In such capacity, I was involved in overseeing the manufacture of all products at the Facility. All of the products manufactured by NFI during this time were for the U.S. military. The ammunition products manufactured were the following: 20 millimeter anti-aircraft ammunition, flares and signals, and ammunition sub-components including primers, detonators and fuses.

7. During World War II, approximately 5000 people were employed at the Facility to meet the military's demand for ammunition. Under 1000 people were employed after World War II. The Facility continued to manufacture military products during the Korean War and the Vietnam War.

8. During the 1960s, ARC manufactured ammunition products and conducted research and development ("R&D") work for the Army. In particular, ARC produced land mines, fuses, detonators, and other ammunition products. The R&D work was conducted for the Picatinny Arsenal in New Jersey.

9. During the early part of the Vietnam War, approximately 700 to 800 people were employed at the Facility. Later, but prior to the Facility's closure in 1970, the workforce was reduced to under 200.

10. All ammunition that was manufactured for the U.S. government at the Facility was produced by blending explosive materials in accordance with a formulation specified by the U.S. government. This blend was then loaded into various shell casings. The finished product was stored on site or in a warehouse located on Circuit Street in Hanover, Massachusetts. The above occurred during World War II, the Korean War and the Vietnam War.

11. Eighty to eighty-five percent of all materials used to produce ammunition products for the U.S. government were supplied and owned by the U.S. government, including all explosive materials. In particular, the U.S. government supplied the following materials: amatol, black powder, freon, lead azide, mercury fulminate, metal parts, shell casings, tetryl, and TNT. The above occurred during World War II, the Korean War and the Vietnam War.

12. Mercury fulminate was used only in the production of munitions for the U.S. government. Mercury fulminate was used as an initiating explosive in many munitions produced for the U.S. military during World War II. Although mercury fulminate continued to be used until the Facility closed in 1970, its use greatly decreased after World War II. No other forms of mercury were used at the Facility during my employment. Lead azide, an explosive used in munitions such as land mines, was used only in the production of munitions for the U.S. government and was used primarily during the Vietnam War.

13. The U.S. government delivered these materials to the Facility. The materials were sent by rail to a rail siding located about three miles away from the Facility. The materials were then delivered to the Facility by truck. Some materials were stored at a warehouse located on Circuit Street in Hanover, Massachusetts. Hazardous or dangerous substances were stored in bunkers in remote areas of the Facility, away from the manufacturing buildings.

14. During World War II, the Army, the Chemical Warfare Service, and the Navy each maintained full time personnel at the Facility.

15. The Navy employed several resident civilians and military officers at the Facility during World War II as inspectors and quality assurance personnel.

16. The Army employed full-time, around-the-clock resident civilians at the Facility during World War II as inspectors and quality assurance personnel. Army officers from the South Boston Army Base inspected the manufacturing and production lines at the Facility two or three times each month.

17. The Chemical Warfare Service employed full-time, around-the-clock resident civilians at the Facility during World War II as inspectors and quality assurance personnel. Military officers from the Chemical Warfare Service inspected the Facility at least two or three times each month.

18. The Army employed several full-time, around-the-clock resident inspectors at the Facility during 1963 and 1964.

19. As a result of my management position and periodic observation of product testing, I know that these U.S. government inspectors supervised and directed the manufacturing of ammunition products, and ensured that the products met the U.S. government's specifications. The resident inspectors supplied by the U.S. government supervised the production of ammunition products each day during each shift. U.S. government inspectors approved production procedures written by company representatives. U.S. government inspectors provided government manuals relating to various ammunition products. U.S. government inspectors were present during all testing of ammunition products. U.S. government inspectors had complete control over the manufacturing process, including the authority to shut the operation down for any reason. This occurred during World War II, the Korean War and the Vietnam War.

20. U.S. government inspectors decided when an ammunition product failed to meet the U.S. government's specifications. All such products were destroyed on site under the U.S. government's direction and control. U.S. government inspectors provided a government manual entitled "Ammunition Inspection Guide" that outlined approved methods for the destruction of unusable ammunition and explosives. U.S. government inspectors were accountable for all materials owned by the U.S. government, and thus had to sign for all material destroyed. U.S. government inspectors were present when unusable ammunition products were destroyed. The above occurred during the World War II era. This also occurred during the Korean War and the Vietnam War, although the procedure was less "formal."

21. During World War II, the Korean War and the Vietnam War, U.S. government inspectors were aware that all waste generated at the Facility remained at the Facility. For safety reasons, U.S. government inspectors would make sure that hazardous and dangerous waste material did not remain in the manufacturing area too long. U.S. government inspectors would instruct company personnel to remove those waste materials to the on-site disposal areas.

22. In the course of my position, I observed that explosive waste materials, including floor sweepings and tetryl from the manufacturing area, were placed in barrels. These barrels were removed each day and buried in the dump area or in storage pits located in the southern end of the site. This occurred during World War II, the Korean War, and the Vietnam War.

23. In the course of my position, I observed that waste solvents, including trichloroethylene and freon, were either dumped onto the ground in the areas at which they were used or were disposed of in the dump area located in the southern end of the site near Factory Pond. This occurred during World War II, the Korean War, and the Vietnam War.

24. In the course of my position, I observed that waste mercury fulminate was dumped onto the ground where it was used or was disposed of on site in the dump area located in the southern end of the site near Factory Pond. Waste mercury fulminate would either be burned or exploded. Waste munitions products containing mercury fulminate would either be exploded underground or exploded in the ponds near the dump area. This occurred during World War II, the Korean War, and the Vietnam War.

25. In the course of my position, I observed that lead azide was disposed of on site in the dump area located in the southern end of the site near Factory Pond. This occurred during World War II, the Korean War, and the Vietnam War.

26. In the course of my position, I observed that paper, cardboard and wood wastes were burned on site in burning pits in the dump area located in the southern end of the site near Factory Pond. This occurred during World War II, the Korean War, and the Vietnam War.

Subscribed and sworn under the pains and penalties of perjury this 17 day of Dec, 1996.

Hubert H. Wolfert

COMMONWEALTH OF MASSACHUSETTS

Plymouth County December 17, 1996

Then personally appeared before me the above-named Hubert H. Wolfert, who swore that the above statements were true to the best of his knowledge and belief.

Phyllis J. Viera
Notary Public
My Commission Expires: 5/2/97

183895.b1

REPRODUCED AT THE NATIONAL ARCHIVES

7

DEPARTMENT OF DEF NEGOTIATED CONTRACT	DEPARTMENT OF THE NAVY	CONTRACT NO. 14576

ISSUING OFFICE

NAME BUREAU OF ORDNANCE	ADDRESS WASHINGTON, D. C.

CONTRACTOR

NAME NATIONAL FIREWORKS ORDNANCE CORPORATION	ADDRESS WEST HANOVER, MASSACHUSETTS

CONTRACT FOR RESEARCH AND DEVELOPMENT ON HIGH EXPLOSIVES	AMOUNT $ 150,000.00

APPROPRIATION AND OTHER ADMINISTRATIVE DATA

Appropriation Chargeable

Army MIPR 4-061-999-00101-1-000-00 57X3600 347-2003 P650 S33-616 CSO&A 53-135 WADC	Est. Cost Fixed Fee	$ 18,885.14 1,114.86 $ 20,000.00
Army MIPR 4-061-999-998-00103-1-000-00 57X3600 247-1003 P650 S33-616 CSO&A R-52-839	Est. Cost Fixed Fee	$ 28,327.70 1,672.30 $ 30,000.00
Airforce MIPR (33-616)-54-83 57X3600 447-3003 P650 07,08,09 S33-616	Est. Cost Fixed Fee	$ 94,425.66 5,574.34 $100,000.00

Office to Make Payment

U. S. Navy Regional Accounts Office
First Naval District
Boston, Massachusetts
All vouchers for payment under this contract should include a reference to NOrd-14576

Dec. 1911 751 Boston 3/16/54

Cost-Plus-Fixed-Fee Contract

Estimated Cost	$141,638.50
Fixed Fee	8,361.50
Total Estimated Cost Plus Fixed Fee	$150,000.00

Security Classification

CONFIDENTIAL

This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18, USC, Sections 793 and 794. The transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

This negotiated contract is entered into pursuant to the provisions of Section 2 (c) (1) of the Armed Services Procurement Act of 1947 (*Public Law 413, 80th Congress*), and any required determination and findings have been made.

THIS CONTRACT is entered into as of 12 January 54, by and between the United States of America, hereinafter called the Government, represented by the Contracting Officer executing this contract, and NATIONAL FIREWORKS ORDNANCE CORPORATION (NAME OF CONTRACTOR) MASSACHUSETTS

(*i*) a corporation organized and existing under the laws of the State of _____

(*ii*) a partnership consisting of _____

(*iii*) an individual trading as _____

hereinafter called the Contractor. The parties hereto agree that the Contractor shall furnish and deliver all the supplies and perform all the services set forth in the attached Schedule, for the consideration stated therein.

DD FORM 1 JUN 50 351 ☆ U. S. GOVERNMENT PRINTING OFFICE 16—92168-1

Wolfert EXHIBIT NO. 7 6-24-97 MICHELLE SYLVIA

RG 402
[illegible]
Box 17
[illegible]

DECLASSIFIED
Authority [illegible]
By [illegible] NARA Date 11/3/11

RODUCED AT THE NATIONAL ARCHIVES

SCHEDULE | PAGE NO. 1 | NO. OF PAGES 3

The parties hereto do further agree that this Contract NOrd-14576 consists of the Title Page (Form DD 351), the Schedule (3 pages), the General Provisions (Clauses 1 through 24 on NAVEXOS form 3302), the Additional General Provisions (Clauses 25 through 32 on NAVORD Form 2050), and a signature page.

Scope of Contract:

Pursuant to the provisions of Clause 25, Scope of Contract, the following Task is hereby assigned:

Task I: The Contractor agrees, for the period 1 February 1954 through 31 January 1955, to make available and employ its research and development facilities and personnel in connection with the continuation of research, development and evaluation testing of MOX explosive fillers, with a view toward development of optimum explosive formulations for use in aircraft armament.

Research studies are to include compositional investigations, and studies on the effect of particle size and purity, altitude effects, mechanism of MOX detonations and kindred problems.

Development efforts are to be devoted to adapting MOX explosive formulations for use in weapons and are to include performance evaluations, cook-off studies, development of loading techniques, and other problems.

The estimated cost of work to be performed under Task I is $150,000.00, including a fixed fee of $8,361.50.

Total Estimated Cost:

One Hundred Fifty Thousand Dollars ($150,000.00), including a fixed fee of Eight Thousand, Three Hundred Sixty-one Dollars and Fifty Cents ($8,361.50).

Reports:

The Contractor is to provide a minimum of ten (10) copies, (one (1) reproducible), of a final report giving complete and detailed summary of the work under this contract. In addition, the Contractor is to provide a minimum of five (5) copies, (one (1) reproducible), of a monthly letter progress report.

DD FORM 1 JUN 50 351-1

RG 407
[illegible]
Box 17
[illegible]
12 [illegible]

DECLASSIFIED
Authority [illegible]
By [illegible] NARA Date [illegible]

RODUCED AT THE NATIONAL ARCHIVES

Payment of Fixed Fee:

Not to exceed ninety (90) percent of the fixed fee for each Task for any given period of this contract shall be paid in installments at the time of each provisional payment on account of Allowable Cost under each Task, the amount of each such installment thus payable to be equal to the proportion of said ninety (90) percent that said related provisional payment bears to the total estimated cost of performance of the Task concerned during the period involved, as the same may be amended from time to time. Upon completion of the work or expiration of the contract period with respect to which any fixed fee is calculated and is payable, whichever event first occurs, that portion of the fee theretofore withheld in accordance with this paragraph shall be paid to the Contractor, provided (i) the Contractor shall have certified that it has used its best efforts to do all the work called for by the contract, and (ii) the Government, as represented by the Contracting Officer, certifies that the Contractor has performed satisfactorily the work called for. It is hereby understood and agreed that if either of the foregoing conditions is not met, or if circumstances (whether within or without the control of the Contractor) have arisen which have prevented the Contractor from performing the work in the manner and to the extent contemplated at the inception of the contract period involved, an equitable adjustment of the fee shall be made within the limits of the amount of fee so withheld. Failure of the parties to agree to such adjustment of the fee shall constitute a dispute within the meaning of the clause of this contract entitled "Disputes".

Revisions to the General Provisions:

Clause 7, Disputes: In Line 18, after the word "shall", INSERT the following:

, unless determined by a court of competent jurisdiction to have been fraudulent, arbitrary, capricious, or so grossly erroneous as necessarily to imply bad faith,

Clause 21. Military Security Requirements is superseded by a new Clause 21 attached hereto.

Clause 23. Termination for Convenience of the Government is superseded by a new Clause 23 entitled "Termination" attached hereto.

Clause 24. Records is superseded by a new Clause 24 entitled "Records" attached hereto.

DD FORM 1 JUN 50 351-1

16—63170-1 U. S. GOVERNMENT PRINTING OFFICE

RG 402
Acc. # 66 L 7506
Box 17
Cy "Contract # Nord 14576
12 Jan 1954, ..."

DECLASSIFIED
Authority [illegible]
By [illegible] NARA Date 4/3/71

RODUCED AT THE NATIONAL ARCHIVES

Revisions to the Additional General Provisions:

Clause 27. Allowable Cost, Fixed Fee and Payment: Subparagraph (a)(2) is hereby superseded by the following new subparagraph:

(2) Costs, not expressly excluded by any other provision of this contract, incurred by the Contractor in the performance of this contract which shall be claimed by the Contractor and accepted as such cost by the Bureau of Supplies and Accounts (Cost Inspection Service), in accordance with the provisions of Part 2 of Section XV of the Armed Services Procurement Regulation, including but not limited to the following:

Clause 27. Allowable Cost, Fixed Fee and Payment: DELETE subparagraphs (a)(2)(A), (a)(2)(B), (a)(2)(C), (a)(2)(G) and (a)(2)(H) in their entirety.

Clause 31. Period of Contract: DELETE the provision thereunder in its entirety, and in lieu thereof INSERT:

The Contractor shall not be required to perform any work under this contract beyond the period of the contract set forth in the Schedule, unless such period is extended by mutual agreement; provided, however, that the Contracting Officer may, at his election, require the Contractor to continue to perform the work beyond the period of the contract set forth in the Schedule until the total estimated cost, including fixed fee, of the work for such period (exclusive of any increase therein effected pursuant to the provisions of the Clause hereof entitled "Limitation of Cost") shall have been expended.

Clause 32. Renegotiation. DELETE in its entirety and in lieu thereof ADD the unnumbered clause entitled "Renegotiation" attached hereto.

At the end of the Additional General Provisions, ADD new Clauses 33, 34 and 35 entitled "Utilization of Small Business", "Gratuities", and "Excusable Delays", respectively attached hereto.

Priority:

Certified under NPA Regulation 2/DMS Regulation 1, DO-A6.

DD FORM 1 JUN 50 351-1

RG 402
Acc. # 66 L 7506
Box 17
Cr "Contract # Nord 14576
12 Jan 1944, ..."

DECLASSIFIED
Authority [illegible]
By [illegible] NARA Date 4/13/77

RODUCED AT THE NATIONAL ARCHIVES

NAVEXOS-5302 (6-51)

GENERAL PROVISIONS

(Cost Reimburse ... Type Contract for Experimental, Developmental or ... search Work)

1. DEFINITIONS

As used throughout this contract, the following terms shall have the meanings set forth below:

(a) The term "Secretary" means the Secretary, the Under Secretary, or any Assistant Secretary of the Department of the Navy; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the Secretary.

(b) The term "Contracting Officer" means the person executing this contract on behalf of the Government, and any other officer or civilian employee who is a properly designated Contracting Officer; and the term includes, except as otherwise provided in this contract, the authorized representative of a Contracting Officer acting within the limits of his authority.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes purchase orders under this contract.

(d) The term "Department" means the Department of the Navy.

2. CHANGES

The Contracting Officer may at any time, by a written order, and without notice to the sureties, if any, make changes, within the general scope of this contract, in any one or more of the following: (i) drawings, designs, or specifications; (ii) method of shipment or packing of any articles to be delivered to the Government hereunder; (iii) place of delivery, inspection, or acceptance of the work; and (iv) the amount of Government-furnished property. If any such change causes a material increase or decrease in the estimated cost of, or the time required for, performance of the work, or otherwise materially affects any other provision of this contract, an equitable adjustment shall be made in the fixed fee, if any, in the time of performance, or in such other provisions of the contract as may be so affected, and the contract shall be modified in writing accordingly. Any claim by the Contractor for adjustment under this clause must be asserted within 30 days from the date of receipt by the Contractor of the notification of change; *provided*, however, that the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim asserted at any time prior to final payment under this contract. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes." However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

3. GOVERNMENT PROPERTY

(a) The Government shall deliver to the Contractor the property described in the Schedule or the specifications at the times stated therein, or if not so stated in sufficient time to enable the Contractor to perform this contract. If any of such property is not delivered to the Contractor by such time or times, the Contracting Officer, upon written request of the Contractor, shall equitably adjust the time of performance of this contract. In no event shall the Government be liable to the Contractor for damages or loss of profit by reason of any delay in or failure to deliver any or all of the items set forth in the Schedule or specifications.

(b) Title to all property furnished by the Government shall remain in the Government. Title to all property purchased by the Contractor, for the cost of which the Contractor is entitled to be reimbursed as a direct item of cost under this contract, shall pass to and vest in the Government upon delivery of such property by the vendor. Title to other property, the cost of which is reimbursable to the Contractor under this contract, shall pass to and vest in the Government upon (i) issuance for use of such property in the performance of this contract, or (ii) commencement of processing or use of such property in the performance of this contract, or (iii) reimbursement of the cost thereof by the Government, whichever first occurs. All the items to be furnished by the Government, as set forth in the Schedule or specifications, together with all property acquired by the Contractor title to which vests in the Government under this paragraph, are subject to the provisions of this clause and are hereinafter collectively referred to as "Government Property."

(c) Title to the Government Property shall not be affected by the incorporation or attachment thereof to any property not owned by the Government, nor shall such Government Property, or any part thereof, be or become a fixture or lose its identity as personalty by reason of affixation to any realty. The Contractor shall maintain adequate property control records of the Government Property and shall identify the Government Property as such in accordance with the provisions of the "Manual for Control of Government Property in Possession of Contractors" dated March 1951, which is incorporated herein by reference.

(d) The Government Property provided or furnished pursuant to the terms of this contract shall, unless otherwise provided herein, be used only for the performance of this contract.

(e) The Contractor shall maintain and administer, in accordance with sound industrial practice, a program for the maintenance, repair, protection, and preservation of Government Property, so as to assure its full availability and usefulness for the performance of this contract. The Contractor shall take all reasonable steps to comply with all appropriate directions or instructions which the Contracting Officer may prescribe as reasonably necessary for the protection of Government Property.

(f) (i) The Contractor shall not be liable for any loss of or damage to the Government Property, or for expenses incidental to such loss or damage, except that the Contractor shall be responsible for any such loss or damage (including expenses incidental thereto) (A) which results from willful misconduct or lack of good faith on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (I) all or substantially all of the Contractor's business, or (II) all or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed, or (III) a separate and complete major industrial operation in connection with the performance of this contract; or (B) which results from a failure on the part of the Contractor, due to the willful misconduct or lack of good faith on the part of any of its directors, officers, or other representatives mentioned in subparagraph (A) above, to maintain and administer, in accordance with sound industrial practice, the program for maintenance, repair, protection, and preservation of Government Property as required by paragraph (e) hereof, or which results from a failure on the part of the Contractor to take all reasonable steps to comply with any appropriate written directions of the Contracting Officer under paragraph (e) hereof; or (C) for which the Contractor is otherwise responsible under the express terms of the clause or clauses, if any, specified in the Schedule; or (D) which results from a risk expressly required to be insured under this contract, but only to the extent of the insurance so required to be procured and maintained, or to the extent of insurance actually procured and maintained, whichever is greater; or (E) which results from a risk which is in fact covered by insurance or for which the Contractor is otherwise reimbursed, but only to the extent of such insurance or reimbursement; *provided*, that if more than one of the above exceptions shall be applicable in any case, the Contractor's liability under any one exception shall not be limited by any other exception.

(ii) The Contractor shall not be reimbursed for, and shall not include as an item of overhead, the cost of insurance, or any provision for a reserve, covering the

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Box 17
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12 Jan 1951, ..."

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By [illegible] NARA Date 4/13/71

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risk of loss of or damage to the Government Property, except to the extent that the Government may have required the Contractor to carry such insurance under any other provision of this contract.

(iii) Upon the happening of loss or destruction of or damage to the Government Property, the Contractor shall notify the Contracting Officer thereof, and shall communicate with the Loss and Salvage Organization, if any, now or hereafter designated by the Contracting Officer, and with the assistance of the Loss and Salvage Organization so designated (unless the Contracting Officer has designated that no such organization be employed), shall take all reasonable steps to protect the Government Property from further damage, separate the damaged and undamaged Government Property, put all the Government Property in the best possible order, and furnish to the Contracting Officer a statement of (A) the lost, destroyed, and damaged Government Property, (B) the time and origin of the loss, destruction, or damage, (C) all known interests in commingled property of which the Government Property is a part, and (D) the insurance, if any, covering any part of or interest in such commingled property. The Contractor shall make repairs and renovations of the damaged Government Property or take such other action, as the Contracting Officer directs.

(iv) In the event the Contractor is indemnified, reimbursed, or otherwise compensated for any loss or destruction of or damage to the Government Property, it shall use the proceeds to repair, renovate, or replace the Government Property involved, or shall credit such proceeds against the cost of the work covered by the contract, or shall otherwise reimburse the Government, as directed by the Contracting Officer. The Contractor shall do nothing to prejudice the Government's right to recover against third parties for any such loss, destruction, or damage and, upon the request of the Contracting Officer, shall, at the Government's expense, furnish to the Government all reasonable assistance and cooperation (including the prosecution of suit and the execution of instruments of assignment in favor of the Government) in obtaining recovery.

(g) The Government shall at all reasonable times have access to the premises where any of the Government Property is located.

(h) The Government Property shall remain in the possession of the Contractor for such period of time as is required for the performance of this contract unless the Contracting Officer determines that the interests of the Government require removal of such property. In such case the Contractor shall promptly take such action as the Contracting Officer may direct with respect to the removal and shipping of Government Property. In any such instance, the contract may be amended to accomplish an equitable adjustment in the terms and provisions thereof.

(i) Upon the completion of this contract, or at such earlier date as may be fixed by the Contracting Officer, the Contractor shall submit to the Contracting Officer in a form acceptable to him, inventory schedules covering all items of the Government Property not consumed in the performance of this contract (including any resulting scrap), or not theretofore delivered to the Government, and shall deliver or make such other disposal of the Government Property as may be directed by the Contracting Officer. Recoverable scrap shall be reported in accordance with a procedure and in such form as the Contracting Officer may direct. The net proceeds of any such disposal approved by the Contracting Officer shall be credited to the cost of the work covered by the contract or shall be paid in such manner as the Contracting Officer may direct.

(j) Unless otherwise provided herein, the Government shall not be under any duty or obligation to restore or rehabilitate, or to pay the costs of the restoration or rehabilitation of, the Contractor's plant or any portion thereof which is affected by the removal of any Government Property.

(k) Directions of the Contracting Officer and communications of the Contractor issued pursuant to this clause shall be in writing.

4. INSURANCE—LIABILITY TO THIRD PERSONS

(a) The Contractor shall procure and thereafter maintain workmen's compensation, employer's liability, and bodily injury liability insurance, with respect to work done under this contract, and such other liability insurance with respect to work done under this contract as the Department may from time to time require or approve. All such insurance shall be in such form, in such amounts, for such periods of time, and with such insurers as the Department may from time to time require or approve.

(b) The Contractor shall be reimbursed (i) for the cost of such insurance of the character described in paragraph (a) of this clause as may be required or approved by the Department, (ii) for the portion allocable to this contract of the reasonable cost of insurance covering the Contractor's property or property for which the Contractor is responsible to someone other than the Government and which is used or to be used in the performance of this contract, and (iii) for liabilities to third persons for loss of or damage to property, death or bodily injury, not compensated by insurance or otherwise, arising out of the performance of this contract, whether or not caused by the negligence of the Contractor, its agents, servants, or employees, provided such liabilities are represented by final judgments or by settlements approved in writing by the Department, and expenses incidental to such liabilities, except liabilities (A) for which the Contractor is otherwise responsible under the express terms of this contract, or (B) with respect to which the Contractor has failed to insure as required or approved by the Department, or (C) which result from willful misconduct or lack of good faith on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (I) all or substantially all of the Contractor's business, or (II) all or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed, or (III) a separate and complete major industrial operation in connection with the performance of this contract.

(c) The Contractor shall give the Department or its representative immediate notice of any suit or action filed, or any claim made, against the Contractor arising out of the performance of this contract, the cost and expense of which is reimbursable to the Contractor under the provisions of this contract, and the risk of which is then uninsured or in which the amount claimed exceeds the amount of insurance coverage. The Contractor shall furnish immediately to the Department copies of all pertinent papers received by the Contractor. If the amount of the liability claimed exceeds the amount of insurance coverage, the Contractor shall authorize representatives of the Government to collaborate with counsel for the insurance carrier, if any, in settling or defending such claim. If the liability is not insured, the Contractor shall, if required by the Department, authorize representatives of the Government to settle or defend any such claim and to represent the Contractor in or take charge of any litigation in connection therewith.

5. ASSIGNMENT OF CLAIMS

(a) Pursuant to the provisions of the Assignment of Claims Act of 1940 as amended (31 U. S. Code 203, 41 U. S. Code 15), if this contract provides for payments aggregating $1,000 or more, claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Notwithstanding any other provision of this contract, payments to an assignee of any moneys due or to become due under this contract shall not, to the extent provided in said Act as amended, be subject to reduction or set-off.

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required by paragraph (g) of this clause, there shall be withheld from final payment under this contract ten per-

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GENERAL PROVISIONS

(Cost Reimbursement Type Contract for Experimental, Developmental or Research Work)

(b) In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret," "Secret," "Confidential," or "Restricted," be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same; *provided*, that a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer.

6. FEDERAL, STATE AND LOCAL TAXES

Except as otherwise provided in this contract, Federal, State and local taxes (other than (i) Federal taxes on income and excess profits, (ii) taxes in connection with financing, refinancing, or refunding operations, and (iii) Federal excise taxes from which exemption is obtainable under Sections 3442(1) and 3442(2) of the Internal Revenue Code or for which a credit is obtainable under Section 3403(c) thereof) paid by the Contractor or any cost or cost-plus-a-fixed-fee subcontractor hereunder (provided that there was no fixed-price subcontractor intervening between such subcontractor and the Contractor) and incident to the performance of this contract shall constitute items of allowable cost under this contract or such cost or cost-plus-a-fixed-fee subcontract if (i) the Contractor has requested the Department to furnish tax exemption certificates or other similar evidence of exemption for use by the Contractor and such cost or cost-plus-a-fixed-fee subcontractor in obtaining exemption from such Federal, State or local taxes and (ii) the Department has notified the Contractor that it will not furnish such evidence of exemption. Payments of taxes for which evidence of exemption has been furnished hereunder shall constitute items of allowable cost under this contract (i) if the Federal taxing authorities have refused to recognize such evidence of exemption or (ii) if the State or local taxing authorities have refused to recognize such evidence of exemption and the Contractor has notified the Contracting Officer of such refusal and has taken such steps as may have been requested by the Government to cause such taxes to be paid under protest, to preserve and to cause to be assigned to the Government any and all rights to any refund of such taxes, to permit the Government to prosecute any claim, litigation or proceeding in the name of the Contractor, and to furnish to the Government all reasonable assistance and cooperation requested by the Government in the prosecution of any such claim, litigation or proceeding for the recovery of such taxes.

7. DISPUTES

Except as otherwise provided in this contract, any dispute (other than one concerning the allowability of cost) concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer; and any dispute concerning the allowability of cost under this contract shall be decided by the Chief of the Bureau of Supplies and Accounts or his duly authorized representative. Such decision shall be reduced to writing and a copy thereof mailed or otherwise furnished to the Contractor. Within 30 days from the date of receipt of such copy, the Contractor may appeal by mailing or otherwise furnishing to the Contracting Officer or the Chief of the Bureau of Supplies and Accounts or his duly authorized representative, as the case may be, a written appeal addressed to the Secretary, and the decision of the Secretary or his duly authorized representative for the hearing of such appeals shall be final and conclusive; *provided*, that if no such appeal is taken, the decision of the Contracting Officer or the Chief of the Bureau of Supplies and Accounts or his duly authorized representative, as the case may be, shall be final and conclusive. In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the decision of the Contracting Officer or Chief of the Bureau of Supplies and Accounts or his duly authorized representative, as the case may be.

8. NOTICE AND ASSISTANCE REGARDING PATENT INFRINGEMENT

(a) The Contractor agrees to report to the Contracting Officer, promptly and in reasonable written detail, each claim of patent infringement based on the performance of this contract and asserted against it, or against any of its subcontractors if it has notice thereof.

(b) In the event of litigation against the Government on account of any claim of infringement arising out of the performance of this contract or out of the use of any supplies furnished or construction work performed hereunder, the Contractor agrees that it will furnish to the Government, upon request, all evidence and information in its possession pertaining to the defense of such litigation. Such information shall be furnished at the expense of the Government except in those cases in which the Contractor has agreed to indemnify the Government against the claim being asserted.

9. REPORTING OF ROYALTIES — NO

If this contract is in an amount which exceeds $10,000, the Contractor agrees to report in writing to the Contracting Officer, during the performance of this contract and prior to its completion or final settlement, the amount of any royalties or royalty rates paid or to be paid by it directly to others in connection with the performance of this contract, together with the names and addresses of licensors to whom such payments are made and either the patent numbers involved or such other information as will permit identification of the patents or other basis on which royalties are to be paid. Where the Contractor's compliance with the foregoing reporting requirement is found by the Contracting Officer to be impracticable because of the size of the Contractor's business or because of the nature of its accounting procedures, the Contractor may furnish one or more reports, based on its established accounting periods and covering the entire contract period, of royalties in excess of $1,000 (if computed on an annual basis) paid or to be paid to each licensor on the Contractor's over-all business, together with such other information as will permit identification of the patents or other basis on which royalties are to be paid, in which event the Contractor shall furnish the Contracting Officer, upon his request and at Government expense, an allocation of such royalty payments to Government business or to the work or supplies covered by this contract; reference to any such periodic royalty reports, previously furnished to any Government agency and covering the period of performance of this contract, shall constitute compliance with the reporting requirement of this clause.

10. FILING OF PATENT APPLICATIONS

(a) While and so long as the subject matter of this contract is classified "Secret" or higher, the Contractor agrees that, before filing or causing to be filed a patent application disclosing any of said subject matter, it will refer the proposed application to the Contracting Officer for determination whether, for reasons of national security, such application should be kept secret or the issuance of a patent thereunder otherwise delayed, under pertinent statutes or regulations; and the Contractor agrees to observe any instructions given by the Contracting Officer in this regard, which instructions may include a direction not to file such application so long as the Contracting Officer considers that such filing would jeopardize national security. If the Contracting Officer directs the Contractor not to file such application, the Contractor may submit to the Contracting Officer a written request, addressed to the Secretary, for reconsideration of such direction, but pending action by the Secretary, the Contractor shall observe such instruction.

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(b) While and so long as the subject matter of this contract is classified "Confidential" or higher, and if the Contracting Officer determines that there is no other practical means for maintaining the security of said subject matter, the Contractor agrees to assign and convey to the Government upon request the entire right, title and interest in and to each United States patent application disclosing said subject matter and filed by or on behalf of the Contractor, the title to the assigned patent application to be held in trust by the Government, subject to reversion of the entire right, title and interest therein to the Contractor (i) upon allowance of the said application and payment of the final fee, or (ii) upon the mailing of notice by the Contracting Officer to the Contractor that disclosure of the subject matter of the application will no longer jeopardize security. Nothing contained in this paragraph shall (A) apply to any patent application assigned to the Government under any other provision of this contract, or (B) enlarge or diminish the rights granted to or reserved by the Government or the Contractor with respect to said application or the invention covered thereby, except to the extent expressly provided in this clause.

(c) While and so long as the subject matter of this contract is classified "Confidential," the Contractor agrees to furnish to the Contracting Officer, at the time of or prior to filing or causing to be filed a patent application disclosing any of said subject matter, a copy of such application for determination whether, for reasons of national security, such application should be kept secret or the issuance of a patent thereunder otherwise delayed, under pertinent statutes or regulations; and the Contractor agrees to observe any instructions of the Contracting Officer in this regard.

(d) While and so long as the subject matter of this contract is classified "Restricted," the Contractor shall be governed by the provisions of the clause of this contract entitled "Military Security Requirements."

11. AUTHORIZATION AND CONSENT

The Government hereby gives its authorization and consent (without prejudice to its rights of indemnification, if such rights are provided for in this contract) for all use and manufacture, in the performance of this contract or any part hereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract), of any patented invention (i) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract, or (ii) utilized in the machinery, tools or methods the use of which results from compliance by the contractor or the using subcontractor with (a) specifications or written provisions now or hereafter forming a part of this contract, or (b) specific written inatructiona given by the Contracting Officer directing the manner of performance.

12. PATENT RIGHTS

(a) As used in this clause, the following terms shall have the meanings set forth below:

(i) The term "Subject Invention" means any invention, improvement or discovery (whether or not patentable) conceived or first actually reduced to practice either (A) in the performance of the experimental, developmental or research work called for under this contract, or (B) in the performance of any experimental, developmental or research work relating to the subject matter of this contract which was done upon the understanding that a contract would be awarded.

(ii) The term "Technical Personnel" means any person employed by or working under contract with the Contractor (other than a subcontractor whose responsibilities with respect to rights accruing to the Government in inventions arising under subcontracts are set forth in paragraphs (f), (g), and (h) of this clause), provided that such person, by reason of the nature of his duties in connection with the performance of this contract, would reasonably be expected to make inventions.

(iii) The terms "subcontract" and "subcontractor" mean any subcontract or subcontractor of the contractor, and any lower-tier subcontract or subcontractor under this contract.

(b) The Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, nontransferable, and royalty-free license to practice, and cause to be practiced for the Government throughout the world, each Subject Invention in the manufacture, use, and disposition according to law, of any article or material, and in the use of any method; *provided*, however, that with respect to (i) any Subject Invention made by other than Technical Personnel, (ii) any Subject Invention conceived prior to any performance of this contract as set forth in paragraph (a) above but first actually reduced to practice in the course of any such performance, and (iii) the practice of any Subject Invention in foreign countries, the said license and other rights hereinafter provided shall be to the extent of the Contractor's right to grant the same without incurring any obligation to pay royalties or other compensation to others solely on account of said grant. Nothing contained in this paragraph shall be deemed to grant any license under any invention other than a Subject Invention. Any license granted herein shall not convey any right to the Government to manufacture, have manufactured, or use any Subject Invention for the purpose of providing services or supplies to the general public in competition with the Contractor or the Contractor's commercial licensees in the licensed fields.

(c) The Contractor agrees as follows: (i) to make written disclosure promptly to the Contracting Officer of each Subject Invention which reasonably appears to be patentable and to exert all reasonable effort to make such disclosure not later than six months after first publication, public use or sale; (ii) to specify, at the time of such disclosure, whether or not said Subject Invention has been or will be claimed in a United States patent application and unless it thereafter notifies the Government to the contrary not later than eight months after first publication, public use or sale, to file or cause to be filed in due form and time a United States patent application covering each Subject Invention so specified; (iii) to the extent of the Contractor's right to do so, to deliver to the Contracting Officer such duly executed instruments (prepared by the Government) of assignment, application papers and rightful oaths as are necessary to vest in the Government the sole and exclusive ownership, and the right to apply for and prosecute patent applications covering, each Subject Invention which the Contractor does not specify as aforesaid (or having so specified, thereafter notifies the Government to the contrary), subject, however, to the reservation of a nonexclusive and royalty-free license thereunder to the Contractor (and to its associated and affiliated companies, if any, within the corporate structure of which the Contractor is a part), which license shall be assignable to the successor of that part of the Contractor's business to which it pertains; (iv) to furnish promptly to the Contracting Officer on request an irrevocable power of attorney to inspect and make copies of each United States patent application as filed by or on behalf of the Contractor covering any Subject Invention; (v) in the event the Contractor elects not to continue prosecution of any such United States patent application filed by the Contractor, to so notify the Contracting Officer not less than sixty days before the expiration of the response period, and upon written request, to deliver to the Contracting Officer, to the extent of the Contractor's right to do so, a duly executed assignment to the Government of the entire rights to such patent application and any Subject Invention claimed therein subject to a reservation as specified in (iii) above; and (vi) to deliver to the Contracting Officer duly executed instruments fully confirmatory of any license rights herein agreed to be granted to the Government. If, to the best of the Contractor's knowledge and belief, no inventions have been conceived or first actually reduced to practice under this contract, the Contractor shall so certify to the Contracting Officer.

(d) The Contractor agrees to and does hereby grant to the Government, to the full extent of the Contractor's right to do so without payment of compensation to others, the right to reproduce, use and disclose for governmental purposes (including the right to give to foreign governments for their use as the national interest of the United States may demand) all or any part of the reports, drawings, blueprints, data and technical information specified to be delivered by the Contractor to the Govern-

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ment under this contract; *provided*, however, that nothing contained in this paragraph shall be deemed, directly or by implication, to grant any license under any patent now or hereafter issued or to grant any right to reproduce anything else called for by this contract.

(*e*) Until the Contractor has delivered to the Government the disclosures required by paragraph (*c*) (i) of this clause and the information as to any subcontractor required by paragraph (*g*) of this clause, there shall be withheld from final payment under this contract ten percent (10%) of the contract price, or $5,000, whichever is smaller; *provided*, however, that the withholding of the aforesaid amount, or subsequent payment thereof to the Contractor, shall not be construed as a waiver of any rights accruing to the Government under this contract; and *provided* further, that any amount so withheld under this paragraph shall not be in addition to any amounts withheld under other provisions of this contract. This paragraph shall not be construed as requiring the Contractor to withhold any amounts from a subcontractor to enforce compliance with the patent provisions of a subcontract.

(*f*) The Contractor agrees to exert all reasonable effort to negotiate for the inclusion in any subcontract hereunder of $3,000 or more, in which payment is to be made for experimental, developmental or research work, of this patent rights clause or one approved by the Contracting Officer. In the event of refusal by a subcontractor to accept such patent rights clause, the Contractor shall obtain the written authorization of the Contracting Officer (which authorization may be granted with respect to a particular subcontract) to proceed with the subcontract, and shall cooperate with the Government in the negotiation with such subcontractor of a mutually acceptable patent rights clause; *provided*, however, that the Contractor shall in any event require the subcontractor to grant to the Government patent rights under Subject Inventions of no less scope and on no less favorable terms than those which the Contractor has under such subcontracts, except that in no event shall the subcontractor be required to grant to the Government patent rights in excess of those herein agreed to be granted to the Government by the Contractor.

(*g*) The Contractor agrees to notify the Contracting Officer in writing of any subcontract containing a patent rights clause, to furnish to the Contracting Officer a copy of such clause, and promptly to notify the Contracting Officer when such subcontract is completed. It is understood that with respect to such subcontract clause, the Government is a third party beneficiary; and the Contractor hereby assigns to the Government all the rights that the Contractor would have to enforce the obligations of the subcontractor with respect to Subject Inventions. The Contractor shall not be obligated to enforce the agreements of any subcontractor hereunder relating to a patent rights clause in any subcontract.

(*h*) When the Contractor shows that it has been delayed in the performance of this contract by reason of its inability to obtain, under reasonable terms that include a suitable patent rights clause, a qualified subcontractor for any particular part, item or function of this contract for which the Contractor itself does not have available facilities or qualified personnel, the Contractor's delivery dates shall be extended for a period of time equal to the duration of such delay; and, upon request of the Contractor, the Contracting Officer shall determine to what extent, if any, an additional extension of the delivery dates, and an increase in contract price based upon additional costs incurred, are proper under the circumstances; and the contract shall be modified accordingly. If the Contractor, after exerting all reasonable effort, is unable to obtain a qualified subcontractor as set forth above, the Contractor may submit to the Contracting Officer a written request for waiver or modification of the requirement that a suitable patent rights clause be included in the subcontract. Such request shall specifically state that the Contractor has used all reasonable efforts to obtain such qualified subcontractor and shall cite the waiver or termination provision hereinafter set forth. If, within thirty-five (35) days after the date of receipt of such request for a waiver or modification of said requirement, the Contracting Officer shall fail to grant such request, the requirement shall be deemed to have been waived by the Government. If within such period the Contractor shall receive a written denial of such request by the Contracting Officer, this contract shall thereupon automatically terminate and the rights and obligations of the parties shall be governed by the provisions of the clause of this contract entitled "Termination for the Convenience of the Government" just as if a notice of termination had been delivered to the Contractor specifying that the contract was terminated for the convenience of the Government.

13. COPYRIGHT

(*a*) The Contractor agrees to and does hereby grant to the Government, and to its officers, agents and employees acting within the scope of their official duties, (i) a royalty-free, nonexclusive and irrevocable license to reproduce, translate, publish, use, and dispose of, and to authorize others so to do, all copyrightable material first produced or composed and delivered to the Government under this contract by the Contractor, its employees or any individual or concern specifically employed or assigned to originate and prepare such material; and (ii) a license as aforesaid under any and all copyrighted or copyrightable work not first produced or composed by the Contractor in the performance of this contract but which is incorporated in the material furnished under the contract, provided that such license shall be only to the extent the Contractor now has, or prior to completion or final settlement of the contract may acquire, the right to grant such license without becoming liable to pay compensation to others solely because of such grant.

(*b*) The Contractor agrees that it will exert all reasonable effort to advise the Contracting Officer, at the time of delivering any copyrightable or copyrighted work furnished under this contract, of any adversely held copyrighted or copyrightable material incorporated in any such work and of any invasion of the right of privacy therein contained.

(*c*) The Contractor agrees to report to the Contracting Officer, promptly and in reasonable written detail, any notice or claim of copyright infringement received by the Contractor with respect to any material delivered under this contract.

14. BUY AMERICAN ACT

The Contractor agrees that there will be delivered under this contract only such unmanufactured articles, materials, and supplies (which term "articles, materials, and supplies" is hereinafter referred to in this clause as "supplies") as have been mined or produced in the United States, and only such manufactured supplies as have been manufactured in the United States substantially all from supplies mined, produced, or manufactured, as the case may be, in the United States. Pursuant to the Buy American Act (41 U. S. Code 10a–d), the foregoing provision shall not apply (i) with respect to supplies excepted by the Secretary from the application of that Act, (ii) with respect to supplies for use outside the United States, or (iii) with respect to the supplies to be delivered under this contract which are of a class or kind determined by the Secretary or his duly authorized representative not to be mined, produced, or manufactured, as the case may be, in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality, or (iv) with respect to such supplies, from which the supplies to be delivered under this contract are manufactured, as are of a class or kind determined by the Secretary or his duly authorized representative not to be mined, produced, or manufactured, as the case may be, in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality, provided that this exception (iv) shall not permit

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delivery of supplies manufactured outside the United States if such supplies are manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.

15. CONVICT LABOR

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment at hard labor.

16. EIGHT-HOUR LAW OF 1912

This contract, to the extent that it is of a character specified in the Eight-Hour Law of 1912 as amended (40 U. S. Code 324–326) and is not covered by the Walsh-Healey Public Contracts Act (41 U. S. Code 35–45), is subject to the following provisions and exceptions of said Eight-Hour Law of 1912 as amended, and to all other provisions and exceptions of said Law:

> No laborer or mechanic doing any part of the work contemplated by this contract, in the employ of the Contractor or any subcontractor contracting for any part of the said work, shall be required or permitted to work more than eight hours in any one calendar day upon such work, except upon the condition that compensation is paid to such laborer or mechanic in accordance with the provisions of this clause. The wages of every such laborer and mechanic employed by the Contractor or any subcontractor engaged in the performance of this contract shall be computed on a basic day rate of eight hours per day; and work in excess of eight hours per day is permitted only upon the condition that every such laborer and mechanic shall be compensated for all hours worked in excess of eight hours per day at not less than one and one-half times the basic rate of pay. For each violation of the requirements of this clause a penalty of five dollars shall be imposed upon the Contractor for each such laborer or mechanic for every calendar day in which such employee is required or permitted to labor more than eight hours upon said work without receiving compensation computed in accordance with this clause; and all penalties thus imposed shall be withheld for the use and benefit of the Government.

17. WALSH-HEALEY PUBLIC CONTRACTS ACT

If this contract is for the manufacture or furnishing of materials, supplies, articles, or equipment in an amount which exceeds or may exceed $10,000 and is otherwise subject to the Walsh-Healey Public Contracts Act as amended (41 U. S. Code 35–45), there are hereby incorporated by reference all representations and stipulations required by said Act and regulations issued thereunder by the Secretary of Labor, such representations and stipulations being subject to all applicable rulings and interpretations of the Secretary of Labor which are now or may hereafter be in effect.

18. NONDISCRIMINATION IN EMPLOYMENT

In connection with the performance of work under this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin; and further agrees to insert the foregoing provision in all subcontracts hereunder except subcontracts for standard commercial supplies or for raw materials.

19. OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

20. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

21. MILITARY SECURITY REQUIREMENTS

(*a*) The provisions of the following paragraphs of this clause shall apply only if and to the extent that this contract involves access to classified matter, which as used in this clause shall mean information or material classified "Top Secret," "Secret," "Confidential," or "Restricted."

(*b*) The Contractor (i) shall be responsible for safeguarding all classified matter and shall not supply or disclose classified matter to any unauthorized person, (ii) shall not make or permit to be made any reproductions of matter classified "Top Secret" except with the prior written authorization of the Contracting Officer, (iii) shall not make or permit to be made any reproductions of matter classified "Secret," "Confidential," or "Restricted" except as may be essential to performance of the contract, (iv) shall submit to the Contracting Officer, at such times as the Contracting Officer may direct, an accounting of all reproductions of matter classified "Top Secret," "Secret," or "Confidential," and (*v*) shall not incorporate in any other project any special features of design or construction which will disclose classified matter, except with the prior written authorization of the Contracting Officer.

(*c*) Except with the prior written consent of the Secretary or his duly authorized representative, the Contractor (i) shall not permit any alien to have access to classified matter, and (ii) shall not permit any individual to have access to matter classified "Top Secret" or "Secret."

(*d*) The Contractor agrees (i) to submit immediately to the Contracting Officer a complete confidential report of any information which the Contractor may have concerning existing or threatened espionage, sabotage, or subversive activity, (ii) to submit to the Contracting Officer, upon written request, any and all information which the Contractor may have concerning any of its employees engaged in any work at any plant, factory, or site at which work under this contract is being performed, and (iii) to exclude from its plant, factory, site, or part thereof, at which work under this contract is being performed, any person or persons whom the Secretary or his duly authorized representative, in the interest of security, may designate in writing.

(*e*) The Contractor is authorized to rely on any letter or other written instrument signed by the Contracting Officer, changing or entirely removing the classification of this contract or of any classified matter.

(*f*) The obligations of the Contractor under this clause shall be in addition to any obligations of the Contractor to comply with all the terms and provisions of any applicable security or secrecy agreement heretofore or hereafter entered into between the Contractor and the Government.

(*g*) The Contractor agrees to insert, in all subcontracts hereunder which involve access to classified matter, provisions which shall conform substantially to the language of this clause, including this paragraph (*g*); *provided*, that such provisions need not be included in any subcontract as to which the Contracting Officer shall consent to the omission of such provisions.

22. PROTECTION OF CLASSIFIED PRINTED MATTER

(*a*) Production and furnishing of classified printed matter called for by this contract are subject to and governed by the provisions of the current edition of the Department's "Security Measures for the Protection of Classified Printed Matter During Production" (NAVEXOS P-29), which provisions are hereby incorporated in this contract by reference.

(*b*) The Contractor shall include a provision identical to this clause, including this paragraph (*b*), in all subcontracts which call for the production and furnishing of classified printed matter under this contract.

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NAVEXOS 3302 (6-511)

23. TERMINATION FOR CONVENIENCE OF THE GOVERNMENT

(a) The performance of work under this contract may be terminated by the Government in whole, or from time to time in part, whenever for any reason the Contracting Officer shall determine any such termination is for the best interests of the Government. Termination of work hereunder shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which performance of work under the contract shall be terminated and the date upon which such termination shall become effective.

(b) After receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the Contractor shall (1) terminate work under the contract on the date and to the extent specified in the Notice of Termination; (2) place no further orders or subcontracts for materials, services or facilities except as may be necessary for completion of such portions of the work under the contract as may not be terminated; (3) terminate all orders and subcontracts to the extent that they relate to the performance of any work terminated by the Notice of Termination; (4) assign to the Government, in the manner and to the extent directed by the Contracting Officer, all of the right, title and interest of the Contractor under the orders or subcontracts so terminated; (5) settle, with the approval or ratification of the Contracting Officer to the extent that he shall require such approval or ratification (which approval or ratification shall be final for all the purposes of this clause), all subcontracts (whether fixed-price or cost or cost-plus-a-fixed-fee), obligations, commitments, liabilities and claims, the cost of which would be reimbursable in accordance with the provisions of this contract in whole or in part; (6) transfer title (to the extent that title has not already been transferred) and deliver to the Government in the manner, to the extent and at the times directed by the Contracting Officer (i) the fabricated or unfabricated parts, work in process, completed work, supplies and other material produced as a part of, or acquired in respect of the performance of, the work terminated by the Notice of Termination, (ii) the plans, drawings, information and other property which, if the contract had been completed, would be required to be furnished to the Government, and (iii) the jigs, dies, fixtures, and other special tools and tooling acquired or manufactured for the performance of this contract for the cost of which the Contractor has been or will be reimbursed under this contract; (7) use its best efforts to sell in the manner, to the extent, at the time and at the price or prices directed or authorized by the Contracting Officer, any property (whether or not title thereto has been transferred to the Government for security or otherwise) of the types referred to in subdivision (6) of this paragraph; *provided, however*, that the Contractor (i) shall not be required to extend credit to any purchaser and (ii) may retain any such property at a price or prices approved by the Contracting Officer, and *provided further* that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be paid in such manner as the Contracting Officer may direct; (8) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and (9) take such action as may be necessary or as the Contracting Officer may direct for the protection and preservation of property which is in the possession of the Contractor and in which the Government has or may acquire an interest. The Contractor shall proceed immediately with the prosecution of the work required under this contract notwithstanding any delays in connection with the adjustment of the fixed fee in accordance with this clause.

(c) The Contractor and the Contracting Officer may agree upon such reduction in the fixed fee as will equitably reflect the diminution of the work as a result of the total or partial termination of work pursuant to this clause. In the event the parties are unable so to agree, the Contracting Officer shall determine such reduction in fixed fee.

(d) In the event the work under this contract is terminated in whole, or from time to time in part, at the option of the Government pursuant to the provisions of paragraph (a) hereof, the Government shall pay to the Contractor the following amounts:

(1) All costs and expenses reimbursable in accordance with the provisions of this contract, not previously paid to the Contractor for the performance of this contract prior to the effective date of the Notice of Termination, and such of these costs and expenses as may continue for a reasonable time thereafter with the approval of or as directed by the Contracting Officer (which approval shall not be unreasonably withheld); *provided, however*, that the Contractor shall proceed as rapidly as practicable to discontinue such costs and expenses.

(2) The cost (so far as not included in payments under subparagraph (1) above) of settling and paying claims either arising out of the termination of work under subcontracts or orders or with respect to any other obligations, commitments and liabilities the cost of which would be reimbursable in accordance with the provisions of this contract or arising in connection with the termination of this contract in whole or in part and properly chargeable to this contract; *provided* (A) any such claim has been settled by negotiation or otherwise and (1) the Contracting Officer has approved or authorized such settlement in writing or (2) such settlement of a fixed-price subcontract or order calls for payment of an amount not in excess of the amount which would be payable under paragraph (b) of the Approved Termination Provision for Use in Fixed Price Orders or Subcontracts for the Manufacture of Supplies under Government War Contracts, as amended by General Regulation No. 6 of the Director of Contract Settlement, or (B) a final judgment has been rendered against the Contractor by a court of competent jurisdiction determining the liability of the Contractor with respect to any such claim and the Contractor has (1) given the Contracting Officer prompt notice of the initiation of the proceedings in which judgment was rendered and offered in writing to give the Government complete control of the defense of the proceedings and (2) diligently defended the suit or, in the event that the Government has assumed control of the defense of the proceedings, rendered such reasonable assistance as has been requested by the Government, and *provided further* that with respect to a judgment determining the liability of the Contractor under any subcontract or order one of the following conditions is satisfied: (i) the Contracting Officer has approved in writing such subcontract or order or the provisions of such subcontract or order dealing with the rights of the parties thereto upon its termination in whole or in part; or (ii) such subcontract or order (if fixed-price) provides in

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the event of termination thereof in whole or in part for payments to the subcontractor or supplier of an amount not in excess of the amount which would be payable under paragraph (b) of the Approved Termination Provision referred to in subdivision (2) (A) of this paragraph.

(3) Any other reasonable cost, approved or ratified by the Contracting Officer (which approval or ratification shall not be unreasonably withheld), incidental to the termination of work under this contract, including legal, accounting, clerical and other costs and expenses (taking into account a reasonable allocation of executive, administrative, and office expenses of the Contractor properly allocable to the termination of such work) incidental to (i) termination of subcontracts or orders hereunder, (ii) cessation of work in accordance with the Notice of Termination and the determination of the amounts due to subcontractors and other third parties, (iii) obtaining payment from the Government, but only to the extent reasonably necessary for the preparation and presentation of settlement proposals and cost evidence in connection therewith, and (iv) protection, disposition, removal, storage, and transportation (including delivery costs into and out of storage resulting from directions of the Contracting Officer), pursuant to paragraphs (b) (7) and (b) (9) hereof, of property in which the Government has or may acquire an interest under this contract (including any Government-furnished property).

(4) The fixed fee agreed upon or determined pursuant to paragraph (c) hereof, less fixed fee payments previously made hereunder.

(e) The obligation of the Government to make any payments under this clause (1) shall be subject to deductions in respect of (i) all unliquidated partial or progress payments, payments on account theretofore made to the Contractor and unliquidated advance payments, (ii) any claim the Government may have against the Contractor in connection with this contract, and (iii) the price agreed upon or the proceeds of sale of any materials, supplies or other things retained by the Contractor or sold, and not otherwise recovered by or credited to the Government, and (2) in the discretion of the Contracting Officer, shall be subject to deductions in respect of any claim of any subcontractor or supplier whose subcontract or order shall have been terminated as provided in paragraph (b) (3) except to the extent that such claim covers (i) property or materials delivered to the Contractor, or (ii) services furnished to the Contractor in connection with the production of completed articles under this contract.

(f) Unless a longer period is otherwise provided for in this contract, or by applicable statute, the Contractor for a period of five years after final settlement under the contract shall make available to the Government at all reasonable times at the office of the Contractor all of its books, records, documents, and other evidence bearing on the costs and expenses of the Contractor under the contract and in respect of the termination of work thereunder.

(g) In the event that the work under this contract is terminated in whole, or from time to time in part, at the option of the Government pursuant to the provisions of paragraph (a) hereof, the Government shall not be obligated to pay to the Contractor any amount for anticipatory profits resulting from the termination or cancellation of any subcontract or order relating to this contract.

24. RECORDS

(a) The Contractor shall keep books, records, documents, and other evidence (herein collectively called "the records") bearing on its costs and expenses under this contract and in respect of any termination of work hereunder. The Contractor's method of accounting shall be subject to the approval of the Department, but no material change need be made therein if it conforms to good accounting practice.

(b) The Contractor shall furnish to the Department upon request such of the records as may be required by the General Accounting Office.

(c) Except for such of the records furnished by the Contractor to the Department pursuant to paragraph (b) of this clause and retained by the Department or the General Accounting Office, the Contractor shall preserve and make available the records in accordance with the provisions of paragraph (f) of the clause of this contract entitled "Termination for Convenience of the Government." Photographing or microphotographing of such records and retention of the photographs or microphotographs thereof in accordance with and to the extent authorized by any regulation or amendment thereof issued by the Director of Contract Settlement pursuant to the Contract Settlement Act of 1944 shall constitute compliance with said paragraph (f).

(d) The provisions of this clause, including this paragraph (d), shall be applicable to, and included in, each fixed-price adjusted, cost or cost-plus-a-fixed-fee subcontract made by the Contractor incident to the performance of this contract.

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ADDITIONAL GENERAL PROVISIONS

(COST REIMBURSEMENT TYPE CONTRACT FOR EXPERIMENTAL, DEVELOPMENTAL OR RESEARCH WORK)

25. SCOPE OF CONTRACT

(a) The Contractor shall furnish the necessary personnel, services of others, facilities, and material and shall use its best efforts to conduct with dispatch the work as specified in the Schedule.

26. LIMITATION OF COST

(a) It is estimated that the total cost to the Government, exclusive of any fixed fee, for the full performance of this contract will not exceed the estimated cost set forth in the Schedule, and the Contractor agrees to use its best efforts to complete the work specified in the Schedule and to perform all obligations under this contract within such estimated cost. If at any time the Contractor has reason to believe that the amount or amounts to be expended by it in the next succeeding thirty (30) days, when added to all previous expenditures, will exceed eighty-five per cent (85%) of the estimated cost set forth in the Schedule, or if at any time the Contractor has reason to believe that the actual cost to the Government of full performance of the contract will be substantially less than the then estimated cost thereof, the Contractor shall notify the Contracting Officer in writing to that effect, giving the revised estimate of its total expenditures for the full performance of this contract, in order that an appropriate increase or decrease may be made in the estimated cost of the contract.

(b) The Government shall not be obligated to reimburse the Contractor for, and the Contractor shall not be obligated to incur, expenditures in the full performance of this contract in excess of the estimated cost set forth in the Schedule unless and until the Contracting Officer shall have notified the Contractor in writing that such estimated cost has been increased and shall have specified in such notice a revised estimated cost which shall thereupon constitute the estimated cost of full performance of this contract.

27. ALLOWABLE COST, FIXED FEE AND PAYMENT

(a) The Government shall pay to the Contractor as full compensation for the performance of this contract:

(1) The fixed fee, if any, specified in the Schedule; and

(2) The Allowable Cost of the performance of this contract, which (unless otherwise specified in the Schedule) is hereby defined as (i) overhead in the amount determined in accordance with subparagraph (G) below; and (ii) all necessary costs of the nature described in subparagraphs (A) to (F) and subparagraph (H) below, incurred by the Contractor directly and specifically in the performance of this contract which shall be claimed by the Contractor and accepted as such cost by the Bureau of Supplies and Accounts (Cost Inspection Service) in accordance with Part 2 of Section XV of the Armed Services Procurement Regulation and the following:

(A) The cost of materials and services including (i) the net cost of materials, apparatus, supplies, equipment and other property, which may from time to time, with the written approval of the Chief of the Bureau of Ordnance or his duly authorized representative, be transferred from the cognisance of this contract for use by subcontractors under this contract or for use under other Government contracts, (ii) the cost, after deducting all discounts taken, of materials, apparatus, supplies, equipment and other property purchased directly for the performance of this contract, (iii) the cost of such materials withdrawn from the Contractor's store or stock rooms and materials fabricated or partially fabricated in the Contractor's plant for the performance of this contract charged in accordance with a sound accounting method consistently followed by the Contractor, and (iv) the cost of services of others required for the performance of this contract.

(B) The salaries and wages of scientists, technicians, draftsmen, and workmen directly employed in the performance of this contract and properly chargeable directly thereto, at rates commited in accordance with a sound accounting method consistently followed by the Contractor.

(C) Unless otherwise provided in the Schedule, cost of the following nature shall be charged as a direct item of cost under this contract:

(1) Transportation and reasonable subsistence of personnel directly employed in the performance of this contract while in travel status.

(2) Overtime premium paid on direct labor covered by subparagraph (B) of this clause, to the extent approved by the Contracting Officer.

(3) Shipping charges (freight and express), inbound only.

(4) Communication expense (long distance telephone and telegraph only).

(5) Extraordinary security expense, to the extent approved by the Contracting Officer.

(D) Payments of taxes to the extent provided in the clause of this contract entitled "Federal, State and Local Taxes", payments of royalties to the extent and subject to the conditions provided in the clause of this contract entitled "Payment of Royalties", and costs which the Government has agreed to assume under paragraph (i) of the clause of this contract entitled "Government Property" and under the clause of this contract entitled "Insurance - Liability to Third Persons".

(E) To the extent specifically provided in the Schedule, all costs incurred by the Contractor in anticipation of this contract and prior to the effective date hereof and which if incurred after the effective date of this contract would have been considered as items of Allowable Cost under this clause.

(F) Purchase and installation cost of special-purpose equipment necessary for the performance of the contract and not required in the normal course of the Contractor's business, as well as the cost of necessary plant rearrangement. All purchases of such equipment in excess of One Hundred Dollars ($100.00) for any single purchase, and all expenses of plant rearrangement in excess of Five Hundred Dollars ($500.00), shall be subject to the prior written approval of the Chief of the Bureau of Ordnance or his duly authorized representative: provided, that such purchases and expenses in excess of the previously stated amounts made by the Contractor may be ratified and approved subsequent to such purchase or expense.

(G) An amount to cover all overhead, indirect charges and other elements of cost not specifically covered by subparagraphs (A) to (F), both inclusive, as specified in the Schedule.

(H) Such other costs, not expressly excluded by other provisions of this contract or by the provisions of Section XV of the Armed Services Procurement Regulation, as should, in the opinion of the Contracting Officer, be included in the cost of the work called for by this contract, and any such costs allowed by the Contracting Officer shall be specifically identified by the Contracting Officer as being allowable under this subparagraph.

(b) Once each month (or at more frequent intervals, if approved by the Bureau of Supplies and Accounts (Cost Inspection Service)) the Contractor may submit to an authorized representative of the Bureau of Supplies and Accounts (Cost Inspection Service), in such form and reasonable detail as such representative may require, an invoice or public voucher supported by a statement of cost incurred by the Contractor in the performance of this contract and claimed to constitute Allowable Cost. The statements of cost shall be certified by two officers or other responsible officials of the Contractor, one of whom shall be a person supervising accounting with respect to the contract.

(c) As promptly as may be practicable after receipt of each invoice or voucher and statement of cost, the Government shall make provisional payment thereon except as hereinafter provided. After payment of eighty percent (80%) of the total estimated cost of performance of this contract, as from time to time amended, further provisional payments on account of Allowable Cost shall be withheld until a reserve of either (i) one percent (1%) of such total estimated cost or (ii) $100,000, whichever shall be less, shall have been set aside, such reserve to be paid to the Contractor at the time of final payment on account of Allowable Cost.

(d) Unless otherwise provided in the Schedule, the fixed fee (or each Task shall be paid in installments at the time of each payment

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on account of Allowable Cost, each such installment thus payable to be in an amount which shall bear the same proportion to the total amount of the fixed fee of the Task as said payment on account of Allowable Cost bears to the total estimated cost of performance of the Task concerned, as from time to time amended. Upon completion of the work under each Task and final acceptance thereof, any balance on account of the fixed fee remaining due and unpaid shall be included in the Contractor's final invoice under the Task and paid to the Contractor.

(e) At any time or times prior to final payment on account of Allowable Cost the Bureau of Supplies and Accounts[Cost and Inspection Service] may cause to be made such audit of the invoices or vouchers and statements of cost as shall be deemed proper. Each provisional payment shall be subject to reduction to the extent of amounts included in the related invoice or voucher and statement of cost which are found by the Bureau of Supplies and Accounts (Cost and Inspection Service) not to constitute Allowable Cost, and shall also be subject to reduction for overpayments or to increase for underpayments on preceding invoices or vouchers. On receipt of the final invoice or voucher and statement of cost, which shall be submitted by the Contractor as promptly as may be practicable following completion of the work under this contract but in no event later than one (1) year from the date of such completion, and following compliance by the Contractor with all provisions of this contract (including, without limitation, provisions relating to patents and the provisions of paragraphs (f) and (g) of this clause), the Government shall as promptly as may be practicable pay any balance of Allowable Cost.

(f) The Contractor and each assignee under an assignment entered into under this contract and in effect at the time of final payment shall execute and deliver at the time of and as a condition precedent to final payment on account of Allowable Cost, a release in form and substance satisfactory to and containing such exceptions as may be found appropriate by the Contracting Officer, discharging the Government, its officers, agents and employees of and from all liabilities, obligations and claims arising out of or under this contract.

(g) The Contractor agrees that any refunds, rebates or credits (including any interest thereon) accruing to or received by the Contractor or any assignee which arise out of the performance of this contract and on account of which the Contractor has received reimbursement shall be paid by the Contractor to the Government. The Contractor and each assignee under an assignment entered into under this contract and in effect at the time of final payment shall execute and deliver at the time of and as a condition precedent to final payment on account of Allowable Cost, an assignment to the Government of refunds, rebates or credits (including any interest thereon) arising out of the performance of this contract in form and substance satisfactory to the Contracting Officer.

(h) Any and all provisional, partial, or advance payments made under this contract shall be secured, when made, by a lien in favor of the Government on account of all payments so made upon the articles and things contracted for and on all material and other property acquired for or allocated to the performance of this contract, except to the extent that the government, by virtue of any other provisions of this contract or otherwise, shall have valid title to such articles, things, materials or other property as against other creditors of the Contractor. Said lien is hereby established and made paramount to all other liens under the provisions of an Act approved August 22, 1911 (Public No. 41, 62nd Congress; 37 Stat. 32; 34 U.S.C. 582).

28. SUBCONTRACTS

(a) The Contractor shall give advance notification to the Contracting Officer of any proposed subcontracts hereunder, and no such subcontract shall be placed without the written approval of the Contracting Officer, which (i) is on a cost or cost-plus-a-fixed-fee basis, or (ii) is on a fixed-price basis exceeding in dollar amount either $1,000 or five per cent (5%) of the total estimated cost of this contract, whichever is less, or (iii) provides for the fabrication, purchase, rental, installation or other acquisition, of any item of industrial facilities or special tooling, or (iv) is on a time-and-material or labor-hour basis. The Contracting Officer may, in his discretion, ratify in writing any of the above subcontracts subsequent to the placement thereof; such action shall constitute fulfillment of the approval requirement of this paragraph (a).

(b) The Contractor agrees that no subcontract placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis. The Contractor further agrees that no cost-plus-a-fixed-fee subcontract placed under this contract will provide for payment of a fixed fee in excess of seven per cent (7%) of the estimated cost thereof, exclusive of the fee, without the prior written approval of the Contracting Officer.

(c) Approval obtained as required by this clause shall in no way relieve the Contractor of any of its obligations assumed under this contract, nor shall it be construed to authorize the allowance of any cost under this contract which would not be allowable if such approval were not required.

(d) The Contractor shall give the Contracting Officer immediate notice in writing of any action or suit filed, or any claim made against the Contractor by any subcontractor or vendor, related in any way to this contract with respect to which the Contractor may be entitled to reimbursement from the Government.

(e) It is contemplated that the Contractor may find it necessary or desirable to subcontract a portion of the work called for under this contract. Any such subcontracting shall entail no adjustment in the fixed fee specified in Schedule A hereof, such fixed fee having been determined in the light of the fact that some of the work hereunder may be subcontracted pursuant to the foregoing provision. The fixed fee specified in Schedule A includes compensation for the services which may be rendered by the Contractor in the negotiation, supervision and coordination of any work subcontracted and for the responsibilities assumed by the Contractor in connection therewith, and is considered to be reasonable.

29. PAYMENT OF ROYALTIES

The Contractor shall not pay any sum for royalties or patent rights not included in the ordinary purchase price of parts embodied in the articles, if any, purchased hereunder, unless and until duly authorized to make such payment by the Government, except royalties payable under the existing license agreements, if any, listed (with the patent numbers and the serial numbers of the patent applications covered by said agreements and the rates of royalty thereunder), in Exhibit A hereto. Recognition of such royalties as are payable pursuant to such license agreements as items of Allowable Cost hereunder shall in no way constitute a recognition by the Government of the validity of any of the patents involved, nor shall any such recognition constitute a waiver of any rights or defenses respecting such patents.

30. REPORTS OF WORK

(a) The Contractor shall submit to the Chief of the Bureau of Ordnance or his duly authorized representative from time to time, as requested, progress reports in triplicate making full disclosure of all work done and the results thereof, provided that the Contractor shall not be required to submit reports more frequently than once each month during the period of the contract. The Chief of the Bureau of Ordnance or his duly authorized representative shall at all reasonable times have full access to the work being performed under this contract.

(b) At the completion of each Task, or at the termination thereof, if not complete, the Contractor will submit a complete report in triplicate of all work done and the results thereof, together with working drawings and specifications of such prototypes, if any, as may have been developed.

31. PERIOD OF CONTRACT

This contract shall continue in force until completion of the work called for hereunder unless sooner terminated by the Government.

32. RENEGOTIATION

(a) This contract is subject to the Renegotiation Act of 1951 (P. L. 9, 82nd Congress) and shall be deemed to contain all the provisions required by Section 104 of said Act.

(b) The Contractor (which term as used in this clause means the party contracting to furnish the materials or perform the work required by this contract) agrees to insert the provisions of this clause, including this paragraph (b), in all subcontracts as required by Section 104 of the Renegotiation Act of 1951; provided, that the Contractor shall not be required to insert the provisions of this clause in any subcontract of a class or type described in Section 106(a) of the Renegotiation Act of 1951.

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21. MILITARY SECURITY REQUIREMENTS

(a) The provisions of this clause shall apply to the extent that this contract involves access to security information classified "Top Secret," "Secret," "Confidential," or "Restricted."

(b) The Government shall notify the Contractor of the security classification of this contract and the elements thereof, and of any subsequent revisions in such security classification, by the use of a Security Requirements Check List (DD Form 254) and Appendage thereto (DD Form 254-1).

(c) To the extent the Government has indicated as of the date of this contract, or thereafter indicates, security classification under this contract as provided in paragraph (b) above, the Contractor shall safeguard all classified elements of this contract and shall provide and maintain a system of security controls within its own organization in accordance with the requirements of (i) the Department of Defense Industrial Security Manual for Safeguarding Classified Security Information as in effect on the date of this contract, which Manual is hereby incorporated by reference and made a part of this contract, (ii) any amendments to said Manual required by the demands of national security as determined by the Government and made after the date of this contract, notice of which has been furnished to the Contractor by the Contracting Officer, and (iii) those provisions of written agreements entered into by the parties pertaining to the adaptation of the Manual to the Contractor's business.

(d) Designated representatives of the Government responsible for inspection pertaining to industrial security shall have the right to inspect at reasonable intervals the procedures, methods and facilities utilized by the Contractor in complying with the requirements of the terms and conditions of this clause. Should the Government, through its authorized representative, determine that the Contractor has not complied with such requirements, the Government shall inform the Contractor in writing of the proper actions to be taken in order to effect compliance with such requirements.

(e) If, subsequent to the date of this contract, the security classifications or requirements under this contract are changed by the Government as provided in this clause, and if such change causes an increase or decrease in the estimated cost of performance of this contract, the estimated cost and fixed fee, shall, to the extent appropriate, be subject to an equitable adjustment. Any such equitable adjustment shall be accomplished in the manner set forth in the clause of this contract entitled "Changes."

(f) The Contractor agrees to insert, in all subcontracts hereunder which involve access to classified security information, provisions which shall conform substantially to the language of this clause, including this paragraph (f) but excluding paragraph (e) of this clause. The Contractor may insert in

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any such subcontract, and any such subcontract entered into thereunder may contain, in lieu of paragraph (e) of this clause, provisions which permit equitable adjustments to be made in the subcontract price or in the estimated cost and fixed fee of the subcontract (as appropriate to the type of subcontract involved) on account of changes in security classifications or requirements made under the provisions of this clause subsequent to the date of the subcontract involved.

(g) The Contractor also agrees that it shall determine that any subcontractor proposed by it for the furnishing of supplies and services which will involve access to classified security information in the Contractor's custody has been granted an appropriate facility security clearance, which is still in effect, prior to being accorded access to such classified security information.

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23. TERMINATION

(a) The performance of work under the contract may be terminated by the Government in accordance with this clause in whole, or from time to time in part, (1) whenever the Contractor shall default in performance of this contract in accordance with its terms (including in the term "default" any such failure by the Contractor to make progress in the prosecution of the work hereunder as endangers such performance), and shall fail to cure such default within a period of ten days (or such longer periods as the Contracting Officer may allow) after receipt from the Contracting Officer of a notice specifying the default, or (2) whenever for any reason the Contracting Officer shall determine that such termination is in the best interests of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying whether termination is for the default of the Contractor or for the convenience of the Government, the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective. If, after notice of termination of this contract for default under (1) above, it is determined that the Contractor's failure to perform or to make progress in performance is due to causes beyond the control and without the fault or negligence of the Contractor pursuant to the provisions of the clause of this contract relating to excusable delays, the Notice of Termination shall be deemed to have been issued under (2) above, and the rights and obligations of the parties hereto shall in such event be governed accordingly.

(b) After receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the Contractor shall (1) stop work under the contract on the date and to the extent specified in the Notice of Termination; (2) place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the work under the contract as is not terminated; (3) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination; (4) assign to the Government, in the manner and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders or subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts; (5) with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final and conclusive for all purposes of this clause, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable in whole or in part, in accordance with the provisions of this contract; (6) transfer title (to the extent that title has not already been transferred) and, in the manner, to the extent, and at the times directed by the Contracting Officer, deliver to

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the Government (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in respect of the performance of, the work terminated by the Notice of Termination, (ii) the completed or partially completed plans, drawings, information, and other property which, if the contract had been completed, would be required to be furnished to the Government, and (iii) the jigs, dies, and fixtures, and other special tools and tooling acquired or manufactured for the performance of this contract for the cost of which the Contractor has been or will be reimbursed under this contract; (7) use its best efforts to sell in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in provision (6) of this paragraph, provided, however, that the Contractor (i) shall not be required to extend credit to any purchaser, and (ii) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or paid in such other manner as the Contracting Officer may direct; (8) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and (9) take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor in which the Government has or may acquire an interest. The Contractor shall proceed immediately with the performance of the above obligations notwithstanding any delay in determining or adjusting the amount of the fixed-fee, or any item of reimbursable cost, under this clause. At any time after expiration of the plant clearance period, as defined in Section VIII, Armed Services Procurement Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer, a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same, provided that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are stored, within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer its termination claim in the form and with the certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than two years from the effective date of

termination, [illegible] Contracting Officer [illegible] such two-year [illegible] Contract[illegible]

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termination, unless one or more extensions in writing are granted by the Contracting Officer upon request of the Contractor made in writing within such two-year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such two-year period or any extension thereof. Upon failure of the Contractor to submit its termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

(d) Subject to the provisions of paragraph (c), the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid (including an allowance for the fixed-fee) to the Contractor by reason of the total or partial termination of work pursuant to this clause. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount.

(e) In the event of the failure of the Contractor and the Contracting Officer to agree in whole or in part, as provided in paragraph (d) above, as to the amounts with respect to costs and fixed-fee, or as to the amount of the fixed-fee, to be paid to the Contractor in connection with the termination of work pursuant to this clause, the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall pay to the Contractor the amount determined as follows:

(1) If the settlement includes cost and fixed-fee

(i) There shall be included therein all costs and expenses reimbursable in accordance with this contract, not previously paid to the Contractor for the performance of this contract prior to the effective date of the Notice of Termination, and such of these costs as may continue for a reasonable time thereafter with the approval of or as directed by the Contracting Officer; provided, however, that the Contractor shall proceed as rapidly as practicable to discontinue such costs.

(ii) There shall be included therein so far as not included under (i) above, the cost of settling and paying claims arising out of the termination of work under subcontracts or orders, as provided in paragraph (b)(5) above, which are properly chargeable to the terminated portion of the contract.

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(iii) There shall be included therein the reasonable costs of settlement, including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the contract and for the termination and settlement of subcontracts thereunder, together with reasonable storage, transportation, and other costs incurred in connection with the protection or disposition of termination inventory; provided, however, that if the termination is for default of the Contractor there shall not be included any amounts for the preparation of the Contractor's settlement proposal.

(iv) There shall be included therein a portion of the fixed-fee payable under the contract determined as follows:

(A) In the event of the termination of this contract for the convenience of the Government and not for the default of the Contractor, there shall be paid a percentage of the fee equivalent to the percentage of the completion of work contemplated by the contract, less fixed-fee payments previously made hereunder.

(B) In the event of the termination of this contract for the default of the Contractor, the total fixed-fee payable shall be such proportionate part of the fee (or, if this contract calls for articles of different types, of such part of the fee as is reasonably allocable to the type of article under consideration) as the total number of articles delivered to and accepted by the Government bears to the total number of articles of a like kind called for by this contract.

If the amount determined under this paragraph is less than the total payment of fixed-fee theretofore made to the Contractor, the Contractor shall repay to the Government the excess amount.

(2) If the settlement includes only the fixed fee, the amount thereof will be determined in accordance with subparagraph (e)(1)(iv) above.

(f) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes," from any determination made by the Contracting Officer under paragraphs (c) or (e) above, except that if the Contractor has failed to submit its claim within the time provided in paragraph (c) above and has failed to request extension of such time, it shall have no such right of appeal. In any case where the Contracting Officer has made a

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(c) such right

determination of the amount due under paragraph (c) or (e) above, the Government shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(g) In arriving at the amount due the Contractor under this clause there shall be deducted (1) all unliquidated advance or other unliquidated payments theretofore made to the Contractor, (2) any claim which the Government may have against the Contractor in connection with this contract, and (3) the agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold pursuant to the provisions of this clause and not otherwise recovered by or credited to the Government.

(h) In the event of a partial termination, the portion of the fixed-fee which is payable with respect to the work under the continued portion of the contract shall be equitably adjusted by agreement between the Contractor and the Contracting Officer, and such adjustment shall be evidenced by an amendment to this contract.

(i) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of the contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate of 6% per annum, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Government; provided, however, that no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition.

(j) The provisions of this clause relating to the fixed-fee shall be inapplicable if this contract does not provide for payment of a fixed-fee.

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24. RECORDS

(a) (1) The Contractor agrees to maintain books, records, documents and other evidence pertaining to the costs and expenses of this contract (hereinafter collectively called the "records") to the extent and in such detail as will properly reflect all net costs, direct and indirect, of labor, materials, equipment, supplies and services, and other costs and expenses of whatever nature for which reimbursement is claimed under the provisions of this contract. The Contractor's accounting procedures and practices shall be subject to the approval of the Bureau of Supplies and Accounts (Cost Inspection Service); provided however, that no material change will be required to be made in the Contractor's accounting procedures and practices if they conform to generally accepted accounting practices and if the costs properly applicable to this contract are readily ascertainable therefrom.

(2) The Contractor agrees to make available at the office of the Contractor at all reasonable times during the period set forth in subparagraph (4) below any of the records for inspection, audit or reproduction by any authorized representative of the Department or of the Comptroller General.

(3) In the event the Comptroller General or any of his duly authorized representatives determines that his audit of the amounts reimbursed under this contract as transportation charges will be made at a place other than the office of the Contractor, the Contractor agrees to deliver, with the reimbursement voucher covering such charges or as may be otherwise specified within two years after reimbursement of charges covered by any such voucher, to such representative as may be designated for that purpose through the Bureau of Supplies and Accounts (Cost Inspection Service) such documentary evidence in support of transportation costs as may be required by the Comptroller General or any of his duly authorized representatives.

(4) Except for documentary evidence delivered to the Government pursuant to subparagraph (3) above, the Contractor shall preserve and make available its records for a period of six years (unless a longer period of time is provided by applicable statute) from the date of the voucher or invoice submitted by the Contractor after the completion of the work under the contract and designated by the Contractor as the "completion voucher" or "completion invoice" or, in the event this contract has been completely terminated, from the date of the termination settlement agreement; provided, however, that records which relate

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to (A) appeals under the clause of this contract entitled "Disputes," (B) litigation or the settlement of claims arising out of the performance of this contract, or (C) costs or expenses of the contract as to which exception has been taken by the Comptroller General or any of his duly authorized representatives shall be retained by the Contractor until such appeals, litigation, claims or exceptions have been disposed of, but in no event for less than the six-year period mentioned above.

(5) Except for documentary evidence delivered pursuant to subparagraph (3) above, and the records described in the proviso of subparagraph (4) above, the Contractor may in fulfillment of its obligation to retain its records as required by this clause substitute photographs, micro-photographs or other authentic reproductions of such records, after the expiration of two years following the last day of the month of reimbursement to the Contractor of the invoice or voucher to which such records relate, unless a shorter period is authorized by the Contracting Officer with the concurrence of the Comptroller General or his duly authorized representative.

(6) The provisions of this paragraph (a), including this subparagraph (6), shall be applicable to and included in each subcontract hereunder which is on a cost, cost-plus-a-fixed-fee, time-and-material or labor-hour basis.

(b) The Contractor further agrees to include in each of his subcontracts hereunder, other than those set forth in subparagraph (a)(6) above, a provision to the effect that the subcontractor agrees that the Comptroller General or the Department, or any of their duly authorized representatives, shall, until the expiration of three years after final payment under the subcontract, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor involving transactions related to the subcontract. The term "subcontract," as used in this paragraph (b) only, excludes (i) purchase orders not exceeding $1,000 and (ii) subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

Clause 24 - Records (6/53)
(Cost-Reimbursement)

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RENEGOTIATION

(a) This contract shall be subject to any act of the Congress, whether heretofore or hereafter enacted and to the extent indicated therein, providing for the renegotiation of said contract and shall be deemed to contain all the provisions required by any such act without subsequent amendment of this contract specifically incorporating such provisions.

(b) The Contractor (which term, as used in this clause, means the party contracting to furnish the materials or perform the work required by this contract) agrees to insert the provisions of this clause, including this paragraph (b), in subcontracts, as defined in Section 103(g) of the Renegotiation Act of 1951 (P.L. 9, 82nd Cong.), except any subcontracts of a class or type described in Section 106(a) of the Renegotiation Act of 1951.

(c) Nothing contained in this clause shall impose any renegotiation obligation with respect to this contract or any subcontract hereunder which is not imposed by an act of the Congress, heretofore or hereafter enacted.

RENEGOTIATION 1/54

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33. UTILIZATION OF SMALL BUSINESS

It is the policy of the Government as declared by the Congress to bring about the greatest utilization of small business concerns which is consistent with efficient production. The Contractor agrees to accomplish the maximum amount of subcontracting to small business concerns that the Contractor finds to be consistent with the efficient performance of this contract.

34. GRATUITIES

(a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such contract; provided, that the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this contract is terminated as provided in paragraph (a) hereof, the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

35. EXCUSABLE DELAYS

The Contractor shall not be liable for any failure in performance of this contract in accordance with its terms (including any failure by the Contractor to make progress in the prosecution of the work hereunder which endangers such performance) if such failure arises out of causes beyond the control and without the fault or negligence of the Contractor. Such causes include, but are not restricted to: Acts of God or of the public enemy; acts of the Government; fires, floods, epidemics; quarantine restrictions; strikes; freight embargoes unusually severe weather, and failure of subcontractors to perform or make progress due to such causes, unless the Contracting Officer shall have determined that the supplies or services to be furnished under the subcontract were obtainable from other sources and shall have ordered the Contractor to procure such services or supplies from such other sources, and the Contractor shall have failed reasonably to comply with such order. Upon request of the Contractor, the Contracting Officer shall ascertain the facts and extent of such failure and, if he shall determine that such failure was occasioned by any one or more of the said causes, the delivery schedule shall be revised accordingly.

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The rights and obligations of the parties to this contract shall be subject to, governed by the Schedule and the General Provisions. To the extent of any inconsistency between the Schedule or the General Provisions, and any specifications or other provisions which are made a part of this contract by reference or otherwise, the Schedule and the General Provisions shall control. To the extent of any inconsistency between the Schedule and the General Provisions, the Schedule shall control.

The Contractor represents that the aggregate number of employees of the Contractor and its affiliates is: ☒ 500 or more, ☐ less than 500.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written:

THE UNITED STATES OF AMERICA

By G. S. Rawson
G. S. RAWSON
Lieutenant Commander (SC), USN
Contracting Officer
(CONTRACTING OFFICER)

WITNESSES

NATIONAL FIREWORKS ORDNANCE CORPORATION
(CONTRACTOR)

By Hubert H. Wolfert

NOTE.—In case of corporation, witnesses not required but certificate below must be completed. Type or print names under all signatures.

Hubert H. Wolfert

Vice President
(TITLE)

West Hanover, Massachusetts
(ADDRESS)

NOTE.—Contractor, if a corporation, should cause the following certificate to be executed under its corporate seal, provided that the same officer shall not execute both the contract and the certificate.

CERTIFICATE

I, A. A. Borland, certify that I am the Assistant Clerk of the corporation named as Contractor herein; that Hubert H. Wolfert, who signed this contract on behalf of the Contractor, was then Vice President of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

A. A. Borland (SIGNATURE) Assistant Clerk (CORPORATE SEAL)

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DEPARTMENT OF DEF NEGOTIATED CONTRACT	DEPARTMENT OF THE NAVY	CONTRACT NO. NOrd-16775
ISSUING OFFICE		
NAME BUREAU OF ORDNANCE	ADDRESS Washington 25, D. C.	
CONTRACTOR		
NAME NATIONAL FIREWORKS ORDNANCE CORPORATION	ADDRESS WEST HANOVER, MASSACHUSETTS	
CONTRACT FOR Production-loading a Proof-lot of 1250 2.75 rocket heads and evaluation and testing thereof		AMOUNT $ 75,000.00

APPROPRIATION AND OTHER ADMINISTRATIVE DATA

See "Appropriation Data Sheet" attached hereto

Office to Make Payment
U. S. Navy Regional Accounts Office
First Naval District
Boston, Massachusetts

All public vouchers for payment under this contract should include a reference to NOrd-16775

DRO 2293
Boston 98/
2/21/56

Cost-Plus-a-Fixed-Fee Contract

Estimated Cost	-	$70,474.41
Fixed Fee	-	4,525.59
Total Estimated Cost Plus Fixed Fee	-	$75,000.00

Security Classification
UNCLASSIFIED

This negotiated contract is entered into pursuant to the provisions of Section 2 (c) (1) of the Armed Services Procurement Act of 1947 (*Public Law 413, 80th Congress*), and any required determination and findings have been made.

THIS CONTRACT is entered into as of 25 January, 19 56, by and between the United States of America, hereinafter called the Government, represented by the Contracting Officer executing this contract, and NATIONAL FIREWORKS ORDNANCE CORPORATION (NAME OF CONTRACTOR)

(*i*) a corporation organized and existing under the laws of the State of Massachusetts

(*ii*) a partnership consisting of _____

(*iii*) an individual trading as _____

hereinafter called the Contractor. The parties hereto agree that the Contractor shall furnish and deliver all the supplies and perform all the services set forth in the attached Schedule, for the consideration stated therein.

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By [illegible] NARA Date 4/3/97

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dated 25 January 1956 ..."

Wolfert
EXHIBIT NO. 5
6-24-97
MICHELLE SYLVIA

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APPROPRIATION DATA SHEET
COST TYPE
NAVORD FORM 2495 (Rev. 8-55)

National Fireworks Ordnance Corp.
National Norther, Technical Division
Re2c req. 1190-56 dtd 12-6-55
NOrd-16775

APPROPRIATION AND BUREAU CONTROL NO.	EXPENDITURE ACCOUNT	OBJECT CLASS	SUBJECT TASK OR ITEM	ESTIMATED COST	FIXED FEE	AMOUNT
17X1710.63 Procurement of Ordnance and Ammunition, Navy			Task			
Bureau Control 21/92000	23000	079	1	$70,474.41	$4,525.59	$75,000.00
				Total		$75,000.00

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SCHEDULE	PAGE NO.	NO. OF PAGES

The parties hereto do further agree that this Contract NOrd-16775 consists of the Title Page (DD Form 351), the Schedule (1 page) and Appendices "A" and "T" thereto, the General Provisions (DD Form 748 - Clauses 1 through 32), the Additional General Provisions (BuOrd Supp. CR-S 7/54 - Clauses 33 through 40), and the Signature Page (DD Form 351-2).

Supplies and Services

Item 1: Production load a proof-lot of 1250 2"75 rocket heads with an improved explosive composition (H-6 or some variant thereof with equal or better performance) and conduct performance test and evaluation thereof.

Total Estimated Cost:

$75,000.00, including a fixed fee of $4,525.59

Completion:

Work performed under Item 1 shall be completed by 31 January 1957.

Acceptance:

Acceptance of the work done under Item 1 shall be made at the Contractor's plant, West Hanover, Massachusetts by the cognizant Naval Inspector.

Allowable Cost and Payment of Fixed Fee:

For the purposes of and subject to the provisions and limitations of the clause of the General Provisions entitled "Allowable Cost, Fixed Fee and Payment", Appendix "T", attached hereto, is incorporated in and made a part of this contract.

Government Property:

Subject to all the terms, conditions, and provisions of the clause hereof entitled "Government Property", the Government will furnish to the Contractor for its use in the performance of this contract 1250 2"75 rocket heads.

Additional Clauses:

The following unnumbered clauses are attached hereto and form a part of this contract:

(a) Patent Rights
(b) Financial Status Report
(c) Priorities, Allocations and Allotments

Priority: Certified under DMS Regulation 1, DO-A6.

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APPENDIX "A"

ALTERATIONS IN CONTRACT

The following alterations have been made in the provisions of this contract:

Clause 1, Definitions: At the end thereof, ADD the following additional definition:

"(d) The term 'Department' means the Department of the Navy."

Clause 4, Allowable Cost, Fixed Fee and Payment:

Paragraph (b): In line 4, DELETE "as to such," and, in lieu thereof, INSERT the following:

"as such"

At the end thereof: ADD a new paragraph (i), as follows:

"(i) Any and all provisional, partial, or advance payments made under this contract shall be secured, when made, by a lien in favor of the Government on account of all payments so made upon the articles and things contracted for and on all material and other property acquired for or allocated to the performance of this contract, except to the extent that the Government, by virtue of any other provisions of this contract or otherwise, shall have valid title to such articles, things, materials, or other property as against other creditors of the Contractor. Said lien is hereby established and made paramount to all other liens under the provisions of an Act approved August 22, 1911 (Public Law No. 41, 62nd Cong.; 37 Stat. 32; 34 U. S. C. 582)."

Clause 10, Termination:

Subparagraph (e) (1) (iv) (B): In line 6, DELETE the word "allowable," and, in lieu thereof, INSERT the following word:

"allocable"

Clause 12, Disputes: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"Except as otherwise provided in this contract, any dispute (other than one concerning the allowability of cost) concerning a question of fact arising under this contract which is not disposed of by agreement shall

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be decided by the Contracting Officer; and any dispute concerning the allowability of cost under this contract shall be decided by the Director, Cost Inspection Service. Such decision shall be reduced to writing and a copy thereof mailed or otherwise furnished to the Contractor. Within 30 days from the date of receipt of such copy, the Contractor may appeal by mailing or otherwise furnishing to the Contracting Officer or to the Director, Cost Inspection Service, as the case may be, a written appeal addressed to the Secretary, and the decision of the Secretary or his duly authorized representative for the hearing of such appeals shall, unless determined by a court of competent jurisdiction to have been fraudulent or capricious or arbitrary or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence, be final and conclusive; provided that, if no such appeal is taken, the decision of the Contracting Officer or the Director, Cost Inspection Service, as the case may be, shall be final and conclusive. In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the decision of the Contracting Officer or the Director, Cost Inspection Service, as the case may be."

Clause 17, Nondiscrimination in Employment: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"(a) In connection with the performance of work under this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, color or national origin. The aforesaid provision shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of the nondiscrimination clause.

(b) The Contractor further agrees to insert the foregoing provision in all subcontracts hereunder, except subcontracts for standard commercial supplies of raw materials.

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Clause 19, Government Property: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"(a) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the property described in the Schedule or specifications, together with such related data and information as the Contractor may request and as may reasonably be required for the intended use of such property (hereinafter referred to as "Government-furnished Property"). The delivery or performance dates for the supplies or services to be furnished by the Contractor under this contract are based upon the expectation that Government-furnished Property suitable for use will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet such delivery or performance dates. In the event that Government-furnished Property is not delivered to the Contractor by such time or times, the Contracting Officer shall, upon timely written request made by the Contractor, make a determination of the delay occasioned the Contractor and shall equitably adjust the estimated cost, fixed fee, or delivery or performance dates, or all of them, and any other contractual provisions affected by such delay, in accordance with the procedures provided for in the clause of this contract entitled "Changes." In the event that Government-furnished Property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt thereof notify the Contracting Officer of such fact and, as directed by the Contracting Officer, either (i) return such property at the Government's expense or otherwise dispose of the property or (ii) effect repairs or modifications. Upon completion of (i) or (ii) above, the Contracting Officer upon written request of the Contractor shall equitably adjust the estimated cost, fixed fee, or delivery or performance dates, or all of them, and any other contractual provision affected by the return or disposition, or the repair or modification, in accordance with the procedures provided for in the clause of this contract entitled "Changes." The foregoing provisions for adjustment are exclusive and the Government shall not be liable to suit for breach of contract by reason of any delay in delivery of Government-furnished Property or delivery of such property in a condition not suitable for its intended use.

(b) Title to all property furnished by the Government shall remain in the Government. Title to all property purchased by the Contractor, for the cost of which the Contractor is entitled to be reimbursed as a direct item of cost under this contract, shall pass to and vest in the Government upon delivery of such property by the vendor. Title to other property, the cost of which is reimbursable to the Contractor under this contract, shall pass to and vest in the Government upon (i) issuance for use of such property in the performance of this contract, or (ii) commencement of processing or use of such property in the performance of this contract, or (iii) reimbursement of the cost thereof by the Government, whichever

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first occurs. All Government-furnished Property, together with all property acquired by the Contractor title to which vests in the Government under this paragraph, are subject to the provisions of this clause and are hereinafter collectively referred to as "Government Property."

(c) Title to the Government Property shall not be affected by the incorporation or attachment thereof to any property not owned by the Government, nor shall such Government Property, or any part thereof, be or become a fixture or lose its identity as personalty by reason of affixation to any realty. The Contractor shall maintain adequate property control records of the Government Property and shall identify the Government Property as such in accordance with the requirements of the "Manual for Control of Government Property in Possession of Contractors" (Appendix B, Armed Services Procurement Regulation), as in effect on the date of the contract, which Manual is hereby incorporated by reference and made a part of this contract.

(d) The Government Property provided or furnished pursuant to the terms of this contract shall, unless otherwise provided herein, be used only for the performance of this contract.

(e) The Contractor shall maintain and administer in accordance with sound industrial practice, a program for the maintenance, repair, protection and preservation of Government Property so as to assure its full availability and usefulness for the performance of this contract. The Contractor shall take all reasonable steps to comply with all appropriate directions or instructions which the Contracting Officer may prescribe as reasonably necessary for the protection of Government Property.

(f) (i) The Contractor shall not be liable for any loss of or damage to the Government Property, or for expenses incidental to such loss or damage, except that the Contractor shall be responsible for any such loss or damage (including expenses incidental thereto) (A) which results from willful misconduct or lack of good faith on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (I) all or substantially all of the Contractor's business, or (II) all or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed, or (III) a separate and complete major industrial operation in connection with the performance of this contract; or (B) which results from a failure on the part of the Contractor, due to the willful misconduct or lack of good faith on the part of any of its directors, officers, or other representatives mentioned in subparagraph (A) above, (I) to maintain and administer, in accordance with sound industrial practice, the program for maintenance, repair, protection and preservation of Government Property as required by paragraph (e) hereof, or (II) to take all reasonable steps to comply with

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any appropriate written directions of the Contracting Officer under paragraph (e) hereof; or (C) for which the Contractor is otherwise responsible under the express terms of the clause or clauses designated in the Schedule; or (D) which results from a risk expressly required to be insured under this contract, but only to the extent of the insurance so required to be procured and maintained, or to the extent of insurance actually procured and maintained, whichever is greater; or (E) which results from a risk which is in fact covered by insurance or for which the Contractor is otherwise reimbursed, but only to the extent of such insurance or reimbursement; provided that, if more than one of the above exceptions shall be applicable in any case, the Contractor's liability under any one exception shall not be limited by any other exception. This clause shall not be construed as relieving a subcontractor from liability for loss or destruction of or damage to Government Property in its possession or control, except to the extent that the subcontract, with the prior approval of the Contracting Officer, may provide for the relief of the subcontractor from such liability. In the absence of such approval, the subcontract shall contain appropriate provisions requiring the return of all Government Property in as good condition as when received, except for reasonable wear and tear or for the utilization of the property in accordance with the provisions of the prime contract.

(ii) The Contractor shall not be reimbursed for, and shall not include as an item of overhead, the cost of insurance, or any provision for a reserve, covering the risk of loss of or damage to the Government Property, except to the extent that the Government may have required the Contractor to carry such insurance under any other provision of this contract.

(iii) Upon the happening of loss or destruction of or damage to the Government Property, the Contractor shall notify the Contracting Officer thereof, and shall communicate with the Loss and Salvage Organization, if any, now or hereafter designated by the Contracting Officer, and with the assistance of the Loss and Salvage Organization so designated (unless the Contracting Officer has designated that no such organization be employed), shall take all reasonable steps to protect the Government property from further damage, separate the damaged and undamaged Government property, put all the Government property in the best possible order, and furnish to the Contracting Officer a statement of (A) the lost, destroyed and damaged Government Property, (B) the time and origin of the loss, destruction or damage, (C) all known interests in commingled property of which the Government Property is a part, and (D) the insurance, if any, covering any part of or interest in such commingled property. The Contractor shall make repairs and renovations of the damaged Government Property or take such other action, as the Contracting Officer directs.

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(iv) In the event the Contractor is indemnified, reimbursed, or otherwise compensated for any loss or destruction of or damage to the Government Property, it shall use the proceeds to repair, renovate or replace the Government Property involved, or shall credit such proceeds against the cost of the work covered by the contract, or shall otherwise reimburse the Government, as directed by the Contracting Officer. The Contractor shall do nothing to prejudice the Government's right to recover against third parties for any such loss, destruction or damage and, upon the request of the Contracting Officer, shall, at the Government's expense, furnish to the Government all reasonable assistance and cooperation (including the prosecution of suit and the execution of instruments of assignment in favor of the Government) in obtaining recovery. In addition, where the subcontractor has not been relieved from liability for any loss or destruction of or damage to Government Property, the Contractor shall enforce the liability of the subcontractor for such loss or destruction of or damage to the Government Property for the benefit of the Government.

(g) The Government shall at all reasonable times have access to the premises where any of the Government Property is located.

(h) The Government Property shall remain in the possession of the Contractor for such period of time as is required for the performance of this contract unless the Contracting Officer determines that the interests of the Government require removal of such property. In such case the Contractor shall promptly take such action as the Contracting Officer may direct with respect to the removal and shipping of Government Property. In any such instance, the contract may be amended to accomplish an equitable adjustment in the terms and provisions thereof.

(i) Upon the completion of this contract, or at such earlier date as may be fixed by the Contracting Officer, the Contractor shall submit to the Contracting Officer in a form acceptable to him, inventory schedules covering all items of the Government Property not consumed in the performance of this contract (including any resulting scrap), or not theretofore delivered to the Government, and shall deliver or make such other disposal of the Government Property as may be directed by the Contracting Officer. Recoverable scrap shall be reported in accordance with a procedure and in such form as the Contracting Officer may direct. The net proceeds of any such disposal approved by the Contracting Officer shall be credited to the cost of the work covered by the contract or shall be paid in such manner as the Contracting Officer may direct.

(j) Unless otherwise provided herein, the Government shall not be under any duty or obligation to restore or rehabilitate, or to pay the costs of the restoration or rehabilitation of the Contractor's plant or any portion thereof which is affected by the removal of any Government Property.

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(k) Directions of the Contracting Officer and communications of the Contractor issued pursuant to this clause shall be in writing."

Clause 26, Renegotiation: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"(a) This contract shall be subject to any act of the Congress, whether heretofore or hereafter enacted and to the extent indicated therein, providing for the renegotiation of said contract and shall be deemed to contain all the provisions required by any such act without subsequent amendment of this contract specifically incorporating such provisions.

(b) The Contractor (which term, as used in this clause, means the party contracting to furnish the materials or perform the work required by this contract) agrees to insert the provisions of this clause, including this paragraph (b), in subcontracts, as defined in Section 103(g) of the Renegotiation Act of 1951 (P.L. 9, 82nd Cong.), except any subcontracts of a class or type described in Section 106(a) of the Renegotiation Act of 1951.

(c) Nothing contained in this clause shall impose any renegotiation obligation with respect to this contract or any subcontract hereunder which is not imposed by an act of the Congress, heretofore or hereafter enacted."

Clause 28, Filing of Patent Applications: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"(a) Before filing or causing to be filed a patent application disclosing any subject matter of this contract, which subject matter is classified "Secret" or higher, the Contractor shall, citing the thirty (30) day provision below, transmit the proposed application to the Contracting Officer for determination whether, for reasons of national security, such application should be placed under an order of secrecy or sealed in accordance with the provisions of 35 U. S. Code 181-188 or the issuance of a patent should be otherwise delayed under pertinent statutes or regulations; and the Contractor shall observe any instructions of the Contracting Officer with respect to the manner of delivery of the patent application to the U.S. Patent Office for filing, but the Contractor shall not be denied the right to file such patent application. If the Contracting Officer shall not have given any such instructions within thirty (30) days from the date of mailing or other transmittal of the proposed application, the Contractor may file the application.

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(b) The Contractor shall furnish to the Contracting Officer, at the time of or prior to the time when the Contractor files or causes to be filed a patent application disclosing any subject matter of this contract, which subject matter is classified "Confidential," a copy of such application for determination whether, for reasons of national security, such application should be placed under an order of secrecy or the issuance of a patent should be otherwise delayed under pertinent statutes or regulations.

(c) In filing any patent application coming within the scope of this clause, the Contractor shall observe all applicable security regulations covering the transmission of classified subject matter."

Clause 29, Notice and Assistance Regarding Patent Infringement: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"The provisions of this clause shall be applicable only if the amount of this contract is in excess of $5,000.

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of litigation against the Government on account of any claim of patent infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed hereunder, the Contractor shall furnish to the Government, upon request, all evidence and information in possession of the Contractor pertaining to such litigation. Such evidence and information shall be furnished at the expense of the Government except in those cases in which the Contractor has agreed to indemnify the Government against the claim being asserted."

Clause 30, Reporting of Royalties: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

"The provisions of this clause shall be applicable only if the amount of the contract is in excess of $10,000.

(a) The Contractor shall report in writing (in quadruplicate) to the Contracting Officer as soon as practicable after execution of this contract whether or not any royalties in excess of $250 have been paid or are to be paid by the Contractor directly to any person or firm in connection with the performance of this contract. If royalties in excess of $250 have been paid or are to be paid to any person or firm, the report shall include the following items of information with

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respect to such royalties (including the initial $250):

(1) The name and address of each licensor to whom royalties in excess of $250 have been paid or are to be paid,

(2) The patent numbers, patent application serial numbers (with filing dates), or other identification of the basis for such royalties,

(3) The manner of computing the royalties consisting of (i) a brief identification of each royalty-bearing unit or process, (ii) the total amount of royalties, and (iii) the percentage rate or dollars and cents amount of royalties on each such unit or process; provided, that if the royalties cannot be computed in terms of units or dollars and cents value, then other data showing the manner in which the Contractor computes the royalties.

(b) In lieu of furnishing a report under paragraph (a), the Contractor may furnish a single, consolidated report for each accounting period of the Contractor during which the Contractor has contracts with the Government, provided the Contractor has requested and obtained the prior written approval of the Assistant Chief of Naval Research for Patents. Such consolidated report shall be furnished when the furnishing thereof has been approved, in the number of copies as approved, as soon as practicable after the close of the accounting period covered by the report. Such consolidated report shall be made in accordance with the Contractor's established accounting practice and shall include, for the accounting period, the total amount of royalties accruing to each licensor at a rate in excess of $1,000 per annum on the Contractor's over-all business, together with (i) the name and address of each such licensor, (ii) the patent numbers, patent application serial numbers (with filing dates), or other identification of the basis for such royalties, (iii) a brief description of the subject matter of the license under which royalties are charged, (iv) the percentage rate, or unit amount, or if the royalties do not accrue by rate or unit amount, such other data showing the manner by which the royalties accrue to licensor, and (v) an estimate or approximation (without detailed accounting) of the portion of such royalties that may be attributable to Government contracts. The Contractor shall, if requested by the Government, furnish at Government expense a more detailed allocation of such royalty payments attributable to Government contracts.

(c) In the event that the Contractor requests written approval to furnish consolidated reports under paragraph (b) above, the

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Assistant Chief of Naval Research for Patents shall promptly consider the request and furnish to the Contractor a letter stating whether or not the request is approved and, notwithstanding any such approval, the Contracting Officer shall have the right to question any such subsequently furnished report as to accuracy or completeness of data and to ask for additional information. The Contractor shall furnish a copy of such letter of approval to the Contracting Officer administering this contract.

(d) After payment of eighty percent (80%) of the amount of this contract, as from time to time amended, further payment shall be withheld until a reserve of either (i) ten percent (10%) of such amount or (ii) $5,000, whichever is less, shall have been set aside, such reserve or the balance thereof to be retained until the Contractor shall have furnished to the Contracting Officer the report called for by paragraph (a) hereof or the copy of the letter approving the Contractor's request to furnish the report under paragraph (b); provided, that no amount shall continue to be withheld from payment for the causes specified in this paragraph (d) if the Contracting Officer shall find that the Contractor has not been furnished a letter as required by paragraph (c) within a reasonable time after making written request to submit a single, consolidated report under the provisions of paragraph (b) of this clause; and provided further, that the Contracting Officer may, in his discretion, order payment to be withheld in the amount and manner above provided if the report called for by paragraph (a) is unsatisfactory or if the Assistant Chief of Naval Research for Patents notifies the Contracting Officer that the report called for by paragraph (b) is due but has not been received, or if received, is found to be unsatisfactory. No amount shall be withheld under this paragraph when the minimum amount specified by this paragraph is being withheld under other provisions of this contract. The withholding of any amount or subsequent payment thereof to the Contractor shall not be construed as a waiver of any right accruing to the Government under this contract."

Clause 31, Authorization and Consent: DELETE the subject matter in its entirety, and, in lieu thereof, INSERT the following:

The Government hereby gives its authorization and consent (without prejudice to its rights of indemnification, if such rights are provided for in this contract) for all use and manufacture, in the performance of this contract or any part hereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract), of any patented invention (i) embodied in the structure or composition of any article the delivery of which is accepted by the Government

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under this contract, or (ii) utilized in the machinery, tools, or methods the use of which necessarily results from compliance by the Contractor or the using subcontractor with (a) specifications or written provisions now or hereafter forming a part of this contract, or (b) specific written instructions given by the Contracting Officer directing the manner of performance. The Contractor's entire liability to the Government for patent infringement shall be determined solely by the provisions of the indemnity clause, if any, included in the contract and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted."

Clause 35, Reproduction Rights: DELETE in its entirety, and, in lieu thereof, INSERT the following:

"Reproduction and Use of Technical Data:

The Contractor agrees to and does hereby grant to the Government, to the full extent of the Contractor's right to do so without payment of compensation to others, the right to reproduce, use, and disclose for governmental purposes (including the right to give to foreign governments for their use as the national interest of the United States may demand) all or any part of the reports, drawings, blueprints, data, and technical information specified to be delivered by the Contractor to the Government under this contract; provided, however, that nothing contained in this paragraph shall be deemed, directly or by implication, to grant any license under any patent now or hereafter issued or to grant any right to reproduce anything else called for by this contract."

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ARTICLE "I"

ALLOWABLE COST AND PAYMENT OF FIXED FEE

Allowable Cost

(A) Payment of taxes to the extent provided in the clause of this contract entitled "Federal, State and Local Taxes," payments of royalties to the extent and subject to the conditions provided in the clause of this contract entitled "Payment of Royalties," and costs which the Government has agreed to assume under paragraph (f) of the clause of this contract entitled "Government Property," and under the clause of this contract entitled "Insurance - Liability to Third Persons."

(B) To the extent specifically provided in the paragraph entitled "Anticipatory Costs," if any, in the Schedule, all costs incurred by the Contractor in anticipation of this contract and prior to the effective date hereof and which if incurred after the effective date of this contract would have been considered as items of Allowable Cost under this contract.

(C) Purchase and installation cost of special-purpose equipment necessary for the performance of the contract and not required in the normal course of the Contractor's business, as well as the cost of necessary plant rearrangement. All purchases of such equipment in excess of One Hundred Dollars ($100) for any single purchase, and all expenses of plant rearrangement in excess of Five Hundred Dollars ($500), shall be subject to the prior written approval of the Chief of the Bureau of Ordnance or his duly authorized representative provided, that such purchases and expenses in excess of the previously stated amounts made by the Contractor may be ratified and approved subsequent to such purchase or expense.

Payment of Fixed Fee

Payment on account of the fixed fee for each Task or Item (or of the total fixed fee under the entire contract, where the fixed fee is not separately stated by Task or Item) shall be made in installments at the time of each payment on account of Allowable Cost, each such installment thus payable to be in an amount which shall bear the same proportion to the total amount of the fixed fee of the Task or Item (or the entire contract) as said payment on account of Allowable Cost bears to the total estimated cost of performance of said Task or Item (or the entire contract), as from time to time amended; provided, however, that after eighty-five percent (85%) of the total fixed fee set forth in the Schedule, as from time to time amended, shall have been paid pursuant to the foregoing, further payment on account of the fixed fee shall be withheld pursuant to the provisions of the clause of this contract entitled "Allowable Cost, Fixed Fee and Payment."

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GENERAL PROVISIONS

(Department of Defense Cost-Reimbursement Supply Contract)

1. DEFINITIONS

As used throughout this contract, the following terms shall have the meanings set forth below:

(a) The term "Secretary" means the Secretary, the Under Secretary, or any Assistant Secretary of the Department and the head or any assistant head of the executive agency; and the term "his duly authorized representative" means any person or persons or board (other than the Contracting Officer) authorized to act for the Secretary.

(b) The term "Contracting Officer" means the person executing this contract on behalf of the Government, and any other officer or civilian employee who is a properly designated Contracting Officer; and the term includes, except as otherwise provided in this contract, the authorized representative of a Contracting Officer acting within the limits of his authority.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes purchase orders under this contract.

2. CHANGES

The Contracting Officer may at any time, by a written order, and without notice to the sureties, if any, make changes, within the general scope of this contract, in any one or more of the following: (i) drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the Government in accordance therewith; (ii) method of shipment or packing; (iii) place of delivery; and (iv) the amount of Government-furnished property. If any such change causes an increase or decrease in the estimated cost of, or the time required for, performance of this contract, or otherwise affects any other provision of this contract, an equitable adjustment shall be made (i) in the estimated cost or delivery schedule, or both, (ii) in the amount of any fixed fee to be paid to the Contractor, and (iii) in such other provisions of the contract as may be so affected, and the contract shall be modified in writing accordingly. Any claim by the Contractor for adjustment under this clause must be asserted within thirty (30) days from the date of receipt by the Contractor of the notification of change: *Provided, however*, That the Contracting Officer, if he decides that the facts justify such action, may receive and act upon any such claim asserted at any time prior to final payment under this contract. Failure to agree to any adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes." However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.

3. LIMITATION OF COST

(a) It is estimated that the total cost to the Government, exclusive of any fixed fee, for the performance of this contract will not exceed the estimated cost set forth in the Schedule, and the Contractor agrees to use its best efforts to perform the work specified in the Schedule and all obligations under this contract within such estimated cost. If at any time the Contractor has reason to believe that the costs which it expects to incur in the performance of this contract in the next succeeding thirty (30) days, when added to all costs previously incurred, will exceed eighty-five percent (85%) of the estimated cost then set forth in the Schedule, or if at any time the Contractor has reason to believe that the total cost to the Government, exclusive of any fixed fee, for the performance of this contract will be substantially greater or less than the then estimated cost thereof, the Contractor shall notify the Contracting Officer in writing to that effect, giving its revised estimate of such total cost for the performance of this contract.

(b) The Government shall not be obligated to reimburse the Contractor for costs incurred in excess of the estimated cost set forth in the Schedule, and the Contractor shall not be obligated to continue performance under the contract or to incur costs in excess of the estimated cost set forth in the Schedule, unless and until the Contracting Officer shall have notified the Contractor in writing that such estimated cost has been increased and shall have specified in such notice a revised estimated cost which shall thereupon constitute the estimated cost of performance of this contract. When and to the extent that the estimated cost set forth in the Schedule has been increased, any costs incurred by the Contractor in excess of such estimated cost prior to the increase in estimated cost shall be allowable to the same extent as if such costs had been incurred after such increase in estimated cost.

4. ALLOWABLE COST, FIXED FEE AND PAYMENT

(a) For the performance of this contract, the Government shall pay to the Contractor the cost thereof determined by the Contracting Officer* to be allowable in accordance with Part 2 of Section XV of the Armed Services Procurement Regulation as in effect on the date of this contract and the Schedule (hereinafter referred to as "Allowable Cost"), plus such fixed fee, if any, as may be provided for in the Schedule.

(b) Once each month (or at more frequent intervals, if approved by the Contracting Officer*) the Contractor may submit to an authorized representative of the Contracting Officer,* in such form and reasonable detail as to such representative may require, an invoice or public voucher supported by a statement of cost incurred by the Contractor in the performance of this contract and claimed to constitute Allowable Cost. Each statement of cost shall be certified by an officer or other responsible official of the Contractor authorized by it to certify such statements.

(c) As promptly as may be practicable after receipt of each invoice or voucher and statement of cost, the Government shall, except as hereinafter provided and subject to the provisions of paragraph (d) below, make payment thereon as approved by the Contracting Officer.* After payment of eighty-five percent (85%) of the fixed fee set forth in the Schedule, as from time to time amended, further payment on account of the fixed fee shall be withheld until a reserve of either (i) fifteen percent (15%) of the total fixed fee or (ii) $100,000, whichever amount is less, shall have been set aside, such reserve or the balance thereof to be retained until the execution and delivery of a release by the Contractor as provided in paragraph (e) hereof.

(d) At any time or times prior to final payment under this contract the Contracting Officer* may cause to be made such audit of the invoices or vouchers and statements of cost as shall be deemed necessary. Each payment theretofore made shall be subject to reduction to the extent of amounts included in the related invoice or voucher and statement of cost which are found by the Contracting Officer* on the basis of such audit not to constitute Allow-

**In contracts of the Department of the Navy, read "the Office of the Comptroller of the Navy (Cost Inspection Service)" in lieu of "the Contracting Officer."*

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nble Cost, and shall also be subject to reduction for overpayments or to increase for underpayments on preceding invoices or vouchers. On receipt of the voucher or invoice designated by the Contractor as the "completion voucher" or "completion invoice" and statement of cost, which shall be submitted by the Contractor as promptly as may be practicable following completion of the work under this contract but in no event later than one (1) year (or such longer period as the Contracting Officer may, in his discretion, approve in writing) from the date of such completion, and following compliance by the Contractor with all provisions of this contract (including, without limitation, provisions relating to patents and the provisions of paragraphs (c) and (f) of this clause), the Government shall as promptly as may be practicable pay any balance of Allowable Cost.

(e) The Contractor and each assignee under an assignment entered into under this contract and in effect at the time of final payment under this contract shall execute and deliver at the time of and as a condition precedent to final payment under this contract, a release discharging the Government, its officers, agents, and employees of and from all liabilities, obligations, and claims arising out of or under this contract, subject only to the following exceptions:

(1) Specified claims in stated amounts or in estimated amounts where the amounts are not susceptible of exact statement by the Contractor.

(2) Claims, together with reasonable expenses incidental thereto, based upon the liabilities of the Contractor to third parties arising out of the performance of the contract, which are not known to the Contractor on the date of the execution of the release, and of which the Contractor gives notice in writing to the Contracting Officer not more than six (6) years after the date of the release or the date of any notice to the Contractor that the Government is prepared to make final payment, whichever is earlier.

(3) Claims for reimbursement of costs (other than expenses of the Contractor by reason of its indemnification of the Government against patent liability), including reasonable expenses incidental thereto, incurred by the Contractor under the provisions of the contract relating to patents.

(f) The Contractor agrees that any refunds, rebates, or credits (including any interest thereon) accruing to or received by the Contractor or any assignee which arise out of the performance of this contract and on account of which the Contractor has received reimbursement shall be paid by the Contractor to the Government. The Contractor and each assignee under an assignment entered into under this contract and in effect at the time of final payment under this contract shall execute and deliver at the time of and as a condition precedent to final payment under this contract, an assignment to the Government of refunds, rebates, or credits (including any interest thereon) arising out of the performance of this contract, in form and substance satisfactory to the Contracting Officer. Reasonable expenses incurred by the Contractor for the purpose of securing any such refunds, rebates, or credits shall constitute Allowable Cost when approved by the Contracting Officer.

(g) Any cost incurred by the Contractor under the terms of this contract which would constitute Allowable Cost under the provisions of this clause shall be included in determining the amount payable under this contract, notwithstanding any provisions contained in the specifications or other documents incorporated in this contract by reference, designating services to be performed or materials to be furnished by the Contractor at its expense or without cost to the Government.

(h) Payment of the fixed fee shall be made to the Contractor as provided in the Schedule subject, however, to the withholding provisions of paragraph (c) hereof.

5. Inspection of Supplies and Correction of Defects

(a) All supplies (which term throughout this clause includes without limitation raw materials, components, intermediate assemblies, and end products) shall be subject to inspection and test by the Government, to the extent practicable at all times and places including the period of manufacture, and in any event prior to final acceptance. The Contractor shall provide and maintain an inspection system acceptable to the Government covering the supplies, fabricating methods, and special tooling hereunder. The Government, through any authorized representative, may inspect the plant or plants of the Contractor or of any of its subcontractors engaged in the performance of this contract. If any inspection or test is made by the Government on the premises of the Contractor or a subcontractor, the Contractor shall provide and shall require subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the Government inspectors in the performance of their duties. All inspections and tests by the Government shall be performed in such a manner as will not unduly delay the work. Except as otherwise provided in this contract, final acceptance of any supplies or lots of supplies shall be made as promptly as practicable after delivery thereof and shall be deemed to have been made no later than sixty (60) days after the date of such delivery, if final acceptance has not been made earlier within such period.

(b) At any time during performance of this contract, but not later than six (6) months (or such other period as may be provided in the Schedule) after final acceptance of the supplies or lots of supplies last delivered in accordance with the requirements of this contract, the Government may require the Contractor to remedy by correction or replacement, as directed by the Contracting Officer, any supplies or lots of supplies which at the time of delivery thereof are defective in material or workmanship or otherwise not in conformity with the requirements of this contract. Except as otherwise provided in paragraph (c) hereof, the cost of any such replacement or correction shall be included in Allowable Cost determined as provided in the clause of this contract entitled "Allowable Cost, Fixed Fee and Payment," but no additional fee shall be payable with respect thereto. Such supplies or lots of supplies shall not be tendered again for acceptance unless the former tender and the requirement of correction is disclosed. If the Contractor fails to proceed with reasonable promptness to replace or correct such supplies or lots of supplies, the Government (i) may by contract or otherwise replace or correct such supplies and charge to the Contractor any increased cost occasioned the Government thereby, or may reduce any fixed fee payable under this contract (or require repayment of any fixed fee theretofore paid) in such amount as may be equitable under the circumstances, or (ii) in the case of supplies not delivered, may require the delivery of such supplies, and shall have the right to reduce any fixed fee payable under this contract (or to require repayment of any fixed fee theretofore paid) in such amount as may be equitable under the circumstances, or (iii) may terminate this contract for default as provided in the clause of this contract entitled "Termination." Failure to agree to the amount of any such increased cost to be charged to the Contractor or to such reduction in, or repayment of, the

fixed fee shall be a dispute concerning a question within t... "Dispute... (c) Ne... hereof, d... rection o... the Gove... defective in material or workmanship, or otherwise not in conformity with the requirements of this contract; provided that the Contractor shall not be liable for any such defects or failures which are due to fraud, lack of good faith or willful misconduct on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (1) all or substantially all

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...ed "Top Secret", "Secret", ... any assignee of any claim ... to any other person not ...ided. That a copy of any ...cked may be furnished, or ... may be disclosed, to such ...authorization of the Con-

... Contractor agrees to maintain books, records, documents, and other evidence pertaining to the costs and expenses of this contract (hereinafter collectively called the "records") to the extent and in such detail as will properly reflect all

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fixed fee shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes."

(c) Notwithstanding the provisions of paragraph (b) hereof, the Government may at any time require the correction or replacement by the Contractor, without cost to the Government, of supplies or lots of supplies which are defective in material or workmanship, or otherwise not in conformity with the requirements of this contract, if such defects or failures are due to fraud, lack of good faith, or willful misconduct on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (i) all or substantially all of the Contractor's business, or (ii) all or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed, or (iii) a separate and complete major industrial operation in connection with the performance of this contract. Fraud, lack of good faith, or willful misconduct on the part of any of such supervisory personnel shall be deemed to include the selection of individual employees or the retention of employees after any of such supervisory personnel has reason to believe that such employees are habitually careless or otherwise unqualified.

(d) Corrected supplies or replaced supplies shall be subject to the provisions of this clause in the same manner and to the same extent as supplies originally delivered under this contract.

(e) The Contractor shall make its records of all inspection work available to the Government during the performance of this contract and for such longer period as may be specified in this contract.

(f) Except as provided in this clause and as may be provided in the Schedule, the Contractor shall have no obligation or liability to correct or replace supplies or lots of supplies which at the time of delivery are defective in material or workmanship or otherwise not in conformity with the requirements of this contract.

(g) Except as otherwise provided in the Schedule, the Contractor's obligation to correct or replace Government-furnished property (which is property in the possession of or acquired directly by the Government and delivered or otherwise made available to the Contractor) shall be governed by the provisions of the clause of this contract entitled "Government Property."

6. Assignment of Claims

(a) Pursuant to the provisions of the Assignment of Claims Act of 1940 as amended (31 U. S. Code 203, 41 U. S. Code 15), if this contract provides for payments aggregating $1,000 or more, claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Notwithstanding any other provision of this contract, payments to an assignee of any moneys due or to become due under this contract shall not, to the extent provided in said Act as amended, be subject to reduction or set-off.

(b) In no event shall copies of this contract or of any plans, specifications, or other similar documents relating to work under this contract, if marked "Top Secret", "Secret", or "Confidential", be furnished to any assignee of any claim arising under this contract or to any other person not entitled to receive the same: *Provided*, That a copy of any part or all of this contract so marked may be furnished, or any information contained therein may be disclosed, to such assignee upon the prior written authorization of the Contracting Officer.

7. Records

(a) (1) The Contractor agrees to maintain books, records, documents, and other evidence pertaining to the costs and expenses of this contract (hereinafter collectively called the "records") to the extent and in such detail as will properly reflect all net costs, direct and indirect, of labor, materials, equipment, supplies and services, and other costs and expenses of whatever nature for which reimbursement is claimed under the provisions of this contract. The Contractor's accounting procedures and practices shall be subject to the approval of the Contracting Officer:* *Provided, however*, That no material change will be required to be made in the Contractor's accounting procedures and practices if they conform to generally accepted accounting practices and if the costs properly applicable to this contract are readily ascertainable therefrom.

(2) The Contractor agrees to make available at the office of the Contractor at all reasonable times during the period set forth in subparagraph (4) below any of the records for inspection, audit, or reproduction by any authorized representative of the Department or of the Comptroller General.

(3) In the event the Comptroller General or any of his duly authorized representatives determines that his audit of the amounts reimbursed under this contract as transportation charges will be made at a place other than the office of the Contractor, the Contractor agrees to deliver, with the reimbursement voucher covering such charges or as may be otherwise specified within two years after reimbursement of charges covered by any such voucher, to such representative as may be designated for that purpose through the Contracting Officer* such documentary evidence in support of transportation costs as may be required by the Comptroller General or any of his duly authorized representatives.

(4) Except for documentary evidence delivered to the Government pursuant to subparagraph (3) above, the Contractor shall preserve and make available its records for a period of six years (unless a longer period of time is provided by applicable statute) from the date of the voucher or invoice submitted by the Contractor after the completion of the work under the contract and designated by the Contractor as the "completion voucher" or "completion invoice" or, in the event this contract has been completely terminated, from the date of the termination settlement agreement; *Provided, however*, That records which relate to (A) appeals under the clause of this contract entitled "Disputes," (B) litigation or the settlement of claims

*In contracts of the Department of the Navy read "the Office of the Comptroller of the Navy (Cost Inspection Service)" in lieu of "the Contracting Officer."

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arising out of the performance of this contract, or (C) costs or expenses of the contract as to which exception has been taken by the Comptroller General or any of his duly authorized representatives, shall be retained by the Contractor until such appeals, litigation, claims, or exceptions have been disposed of, but in no event for less than the six-year period mentioned above.

(5) Except for documentary evidence delivered pursuant to subparagraph (3) above, and the records described in the proviso of subparagraph (4) above, the Contractor may in fulfillment of its obligation to retain its records as required by this clause substitute photographs, microphotographs or other authentic reproductions of such records, after the expiration of two years following the last day of the month of reimbursement to the Contractor of the invoice or voucher to which such records relate, unless a shorter period is authorized by the Contracting Officer with the concurrence of the Comptroller General or his duly authorized representative.

(6) The provisions of this paragraph (a), including this subparagraph (6), shall be applicable to and included in each subcontract hereunder which is on a cost, cost-plus-a-fixed-fee, time-and-material, or labor-hour basis.

(b) The Contractor further agrees to include in each of his subcontracts hereunder, other than those set forth in subparagraph (a) (6) above, a provision to the effect that the subcontractor agrees that the Comptroller General or the Department, or any of their duly authorized representatives, shall, until the expiration of three years after final payment under the subcontract, have access to and the right to examine any directly pertinent books, documents, papers, and records of such subcontractor involving transactions related to the subcontract. The term "subcontract," as used in this paragraph (b) only, excludes (i) purchase orders not exceeding $1,000 and (ii) subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

8. SUBCONTRACTS

(a) The Contractor shall give advance notification to the Contracting Officer of any proposed subcontract hereunder which (i) is on a cost or cost-plus-a-fixed-fee basis, or (ii) is on a fixed-price basis exceeding in dollar amount either $25,000 or five percent (5%) of the total estimated cost of this contract.

(b) The Contractor shall not, without the prior written consent of the Contracting Officer, place any subcontract which (i) is on a cost or cost-plus-a-fixed-fee basis, or (ii) is on a fixed-price basis exceeding in dollar amount either $25,000 or five percent (5%) of the total estimated cost of this contract, or (iii) provides for the fabrication, purchase, rental, installation or other acquisition, of any item of industrial facilities, or of special tooling having a value in excess of $1,000, or (iv) is on a time-and-material or labor-hour basis. The Contracting Officer may, in his discretion, ratify in writing any such subcontract; such action shall constitute the consent of the Contracting Officer as required by this paragraph (b).

(c) The Contractor agrees that no subcontract placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis.

(d) The Contracting Officer may, in his discretion, specifically approve in writing any of the provisions of a subcontract. However, such approval or the consent of the Contracting Officer obtained as required by this clause shall not be construed to constitute a determination of the allowability of any cost under this contract, unless such approval specifically provides that it constitutes a determination of the allowability of such cost.

(e) The Contractor shall give the Contracting Officer immediate notice in writing of any action or suit filed, and prompt notice of any claim made against the Contractor by any subcontractor or vendor which, in the opinion of the Contractor, may result in litigation, related in any way to this contract with respect to which the Contractor may be entitled to reimbursement from the Government.

9. UTILIZATION OF SMALL BUSINESS CONCERNS

(a) It is the policy of the Government as declared by the Congress to bring about the greatest utilization of small business concerns which is consistent efficient production.

(b) The Contractor agrees to accomplish the maximum amount of subcontracting to small business concerns that the Contractor finds to be consistent with the efficient performance of this contract.

10. TERMINATION

(a) The performance of work under the contract may be terminated by the Government in accordance with this clause in whole, or from time to time in part, (1) whenever the Contractor shall default in performance of this contract in accordance with its terms (including in the term "default" any such failure by the Contractor to make progress in the prosecution of the work hereunder as endangers such performance), and shall fail to cure such default within a period of ten days (or such longer periods as the Contracting Officer may allow) after receipt from the Contracting Officer of a notice specifying the default, or (2) whenever for any reason the Contracting Officer shall determine that such termination is in the best interests of the Government. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying whether termination is for the default of the Contractor or for the convenience of the Government, the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective. If, after notice of termination of this contract for default under (1) above, it is determined that the Contractor's failure to perform or to make progress in performance is due to causes beyond the control and without the fault or negligence of the Contractor pursuant to the provisions of the clause of this contract relating to excusable delays, the Notice of Termination shall be deemed to have been issued under (2) above, and the rights and obligations of the parties hereto shall in such event be governed accordingly.

(b) After receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the Contractor shall (1) stop work under the contract on the date and to the extent specified in the Notice of Termination; (2) place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the work under the contract as is not terminated; (3) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination; (4) assign to the Government, in the manner and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders or subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;

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(5) with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final and conclusive for all purposes of this clause, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable in whole or in part, in accordance with the provisions of this contract; (6) transfer title (to the extent that title has not already been transferred) and, in the manner, to the extent, and at the times directed by the Contracting Officer, deliver to the Government (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in respect of the performance of, the work terminated by the Notice of Termination, (ii) the completed or partially completed plans, drawings, information, and other property which, if the contract had been completed, would be required to be furnished to the Government, and (iii) the jigs, dies, and fixtures, and other special tools and tooling acquired or manufactured for the performance of this contract for the cost of which the Contractor has been or will be reimbursed under this contract; (7) use its best efforts to sell in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in provision (6) of this paragraph: *Provided, however*, That the Contractor (i) shall not be required to extend credit to any purchaser, and (ii) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer: *And provided further*, That the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct; (8) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and (9) take such action as may be necessary, or as the Contracting Officer may direct for the protection and preservation of the property related to this contract which is in the possession of the Contractor in which the Government has or may acquire an interest. The Contractor shall proceed immediately with the performance of the above obligations notwithstanding any delay in determining or adjusting the amount of the fixed-fee, or any item of reimbursable cost, under this clause. At any time after expiration of the plant clearance period, as defined in Section VIII, Armed Services Procurement Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same, provided that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are stored, within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

(c) After receipt of a Notice of Termination, the Contractor shall submit to the Contracting Officer its termination claim in the form and with the certification prescribed by the Contracting Officer. Such claim shall be submitted promptly but in no event later than two years from the effective date of termination, unless one or more extensions in writing are granted by the Contracting Officer upon request of the Contractor made in writing within such two-year period or authorized extension thereof. However, if the Contracting Officer determines that the facts justify such action, he may receive and act upon any such termination claim at any time after such two-year period or any extension thereof. Upon failure of the Contractor to submit its termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

(d) Subject to the provisions of paragraph (c), the Contractor and the Contracting Officer may agree upon the whole or any part of the amount or amounts to be paid (including an allowance for the fixed-fee) to the Contractor by reason of the total or partial termination of work pursuant to this clause. The contract shall be amended accordingly, and the Contractor shall be paid the agreed amount.

(e) In the event of the failure of the Contractor and the Contracting Officer to agree in whole or in part, as provided in paragraph (d) above, as to the amounts with respect to costs and fixed-fee, or as to the amount of the fixed-fee, to be paid to the Contractor in connection with the termination of work pursuant to this clause, the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall pay to the Contractor the amount determined as follows:

(1) If the settlement includes cost and fixed-fee

(i) There shall be included therein all costs and expenses reimbursable in accordance with this contract, not previously paid to the Contractor for the performance of this contract prior to the effective date of the Notice of Termination, and such of these costs as may continue for a reasonable time thereafter with the approval of or as directed by the Contracting Officer: *Provided, however*, That the Contractor shall proceed as rapidly as practicable to discontinue such costs.

(ii) There shall be included therein so far as not included under (i) above, the cost of settling and paying claims arising out of the termination of work under subcontracts or orders, as provided in paragraph (b) (5) above, which are properly chargeable to the terminated portion of the contract.

(iii) There shall be included therein the reasonable costs of settlement, including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the contract and for the termination and settlement of subcontracts thereunder, together with reasonable storage, transportation, and other costs incurred in connection with the protection or disposition of termination inventory: *Provided, however*, That if the termination is for default of the Contractor there shall not be included any amounts for the preparation of the Contractor's settlement proposal.

(iv) There shall be included therein a portion of the fixed-fee payable under the contract determined as follows:

(A) In the event of the termination of this con-

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tract for the convenience of the Government and not for the default of the Contractor, there shall be paid a percentage of the fee equivalent to the percentage of the completion of work contemplated by the contract, less fixed-fee payments previously made hereunder.

(B) In the event of the termination of this contract for the default of the Contractor, the total fixed-fee payable shall be such proportionate part of the fee (or, if this contract calls for articles of different types, of such part of the fee as is reasonably allowable to the type of article under consideration) as the total number of articles delivered to and accepted by the Government bears to the total number of articles of a like kind called for by this contract.

If the amount determined under this paragraph is less than the total payment of fixed-fee theretofore made to the Contractor, the Contractor shall repay to the Government the excess amount.

(2) If the settlement includes only the fixed fee, the amount thereof will be determined in accordance with subparagraph (c) (1) (iv) above.

(f) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes," from any determination made by the Contracting Officer under paragraphs (c) or (e) above, except that if the Contractor has failed to submit its claim within the time provided in paragraph (c) above and has failed to request extension of such time, he shall have no such right of appeal. In any case where the Contracting Officer has made a determination of the amount due under paragraph (c) or (e) above, the Government shall pay to the Contractor the following: (1) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(g) In arriving at the amount due the Contractor under this clause there shall be deducted (1) all unliquidated advance or other unliquidated payments theretofore made to the Contractor, (2) any claim which the Government may have against the Contractor in connection with this contract, and (3) the agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold pursuant to the provisions of this clause and not otherwise recovered by or credited to the Government.

(h) In the event of a partial termination, the portion of the fixed-fee which is payable with respect to the work under the continued portion of the contract shall be equitably adjusted by agreement between the Contractor and the Contracting Officer, and such adjustment shall be evidenced by an amendment to this contract.

(i) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of the contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate of 6% per annum, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Government: *Provided, however*, That no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition.

(j) The provisions of this clause relating to the fixed-fee shall be inapplicable if this contract does not provide for payment of a fixed-fee.

11. EXCUSABLE DELAYS

The Contractor shall not be in default by reason of any failure in performance of this contract in accordance with its terms (including any failure by the Contractor to make progress in the prosecution of the work hereunder which endangers such performance) if such failure arises out of causes beyond the control and without the fault or negligence of the Contractor. Such causes include, but are not restricted to: Acts of God or of the public enemy; acts of the Government; fires; floods; epidemics; quarantine restrictions; strikes; freight embargoes; unusually severe weather; and failure of subcontractors to perform or make progress due to such causes, unless the Contracting Officer shall have determined that the supplies or services to be furnished under the subcontract were obtainable from other sources and shall have ordered the Contractor in writing to procure such services or supplies from such other sources, and the Contractor shall have failed reasonably to comply with such order. Upon request of the Contractor, the Contracting Officer shall ascertain the facts and extent of such failure and, if he shall determine that such failure was occasioned by any one or more of the said causes, the delivery schedule shall be revised accordingly.

12. DISPUTES

Except as otherwise provided in this contract, any dispute concerning a question of fact arising under this contract which is not disposed of by agreement shall be decided by the Contracting Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Contractor. Within 30 days from the date of receipt of such copy, the Contractor may appeal by mailing or otherwise furnishing to the Contracting Officer a written appeal addressed to the Secretary, and the decision of the Secretary or his duly authorized representative for the hearing of such appeals shall, unless determined by a court of competent jurisdiction to have been fraudulent, arbitrary, capricious, or so grossly erroneous as necessarily to imply bad faith, be final and conclusive: *Provided, That*, if no such appeal is taken, the decision of the Contracting Officer shall be final and conclusive. In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the contract and in accordance with the Contracting Officer's decision.

13. BUY AMERICAN ACT

The Contractor agrees that there will be delivered under this contract only such unmanufactured articles, materials and supplies (which term "articles, materials and supplies" is hereinafter referred to in this clause as "supplies") as have been mined or produced in the United States, and only such manufactured supplies as have been manufactured in the United States substantially all from supplies mined, produced, or manufactured, as the case may be, in the United States. Pursuant to the Buy American Act (41

U. S. Code 10a–d), the foregoing prov[illegible] shall not apply [illegible] ...ngs and interpretations of the
(i) with respect to supplies excepted by the S[illegible] are now or may hereafter be in
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of a satisfactory quality, or (iv) with res[illegible]
plies, from which the supplies to be deli[illegible]
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termined by the Secretary or his duly authorized representative not to be mined, produced, or manufactured, as the case may be, in the United States in sufficient and reason-

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EMPLOYMENT

...erformance of work under this
...rees not to discriminate against
...or employment because of race,
...ion; and further agrees to insert
...l subcontracts hereunder except
...ommercial supplies or for raw

18. NOTICE TO THE GOVERNMENT OF LABOR DISPUTES

Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay

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U. S. Code 10a–d), the foregoing provision shall not apply (i) with respect to supplies excepted by the Secretary from the application of that Act, (ii) with respect to supplies for use outside the United States, or (iii) with respect to the supplies to be delivered under this contract which are of a class or kind determined by the Secretary or his duly authorized representative not to be mined, produced, or manufactured, as the case may be, in United States in sufficient and reasonably available commercial quantities and of a satisfactory quality, or (iv) with respect to such supplies, from which the supplies to be delivered under this Contract are manufactured, as are of a class or kind determined by the Secretary or his duly authorized representative not to be mined, produced, or manufactured, as the case may be, in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality: *Provided*, That this exception (iv) shall not permit delivery of supplies manufactured outside the United States if such supplies are manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.

14. Convict Labor

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment at hard labor.

15. Eight-Hour Law of 1912

This contract, to the extent that it is of a character specified in the Eight-Hour Law of 1912 as amended (40 U. S. Code 324–326) and is not covered by the Walsh-Healey Public Contracts Act (41 U. S. Code 35–45), is subject to the following provisions and exceptions of said Eight-Hour Law of 1912 as amended, and to all other provisions and exceptions of said Law:

No laborer or mechanic doing any part of the work contemplated by this contract, in the employ of the Contractor or any subcontractor contracting for any part of the said work, shall be required or permitted to work more than eight hours in any one calendar day upon such work, except upon the condition that compensation is paid to such laborer or mechanic in accordance with the provisions of this clause. The wages of every such laborer and mechanic employed by the Contractor of any subcontractor engaged in the performance of this contract shall be computed on a basic day rate of eight hours per day; and work in excess of eight hours per day is permitted only upon the condition that every such laborer and mechanic shall be compensated for all hours worked in excess of eight hours per day at not less than one and one-half times the basic rate of pay. For each violation of the requirements of this clause a penalty of five dollars shall be imposed upon the Contractor for each such laborer or mechanic for every calendar day in which such employee is required or permitted to labor more than eight hours upon said work without receiving compensation computed in accordance with this clause; and all penalties thus imposed shall be withheld for the use and benefit of the Government.

16. Walsh-Healey Public Contracts Act

If this contract is for the manufacture or furnishing of materials, supplies, articles, or equipment in an amount which exceeds or may exceed $10,000 and is otherwise subject to the Walsh-Healey Public Contracts Act as amended (41 U. S. Code 35–45), there are hereby incorporated by reference all representations and stipulations required by said Act and regulations issued thereunder by the Secretary of Labor, such representations and stipulations being subject to all applicable rulings and interpretations of the Secretary of Labor which are now or may hereafter be in effect.

17. Nondiscrimination in Employment

In connection with the performance of work under this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, creed, color, or national origin; and further agrees to insert the foregoing provision in all subcontracts hereunder except subcontracts for standard commercial supplies or for raw materials.

18. Notice to the Government of Labor Disputes

Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Contracting Officer.

19. Government Property

(a) The Government shall deliver to the Contractor the property described in the Schedule or the Specifications at the times stated therein, or if not so stated in sufficient time to enable the Contractor to perform this contract. If any of such property is not delivered to the Contractor by such time or times, the Contracting Officer, upon written request of the Contractor, shall equitably adjust the time of performance of this contract. In no event shall the Government be liable to the Contractor for damages or loss of profit by reason of any delay in or failure to deliver any or all of the items set forth in the Schedule or Specifications.

(b) Title to all property furnished by the Government shall remain in the Government. Title to all property purchased by the Contractor, for the cost of which the Contractor is entitled to be reimbursed as a direct item of cost under this contract, shall pass to and vest in the Government upon delivery of such property by the vendor. Title to other property, the cost of which is reimbursable to the Contractor under this contract, shall pass to and vest in the Government upon (i) issuance for use of such property in the performance of this contract, or (ii) commencement of processing or use of such property in the performance of this contract, or (iii) reimbursement of the cost thereof by the Government, which ever first occurs. All the items to be furnished by the Government, as set forth in the Schedule or Specifications, together with all property acquired by the Contractor title to which vests in the Government under this paragraph, are subject to the provisions of this clause and are hereinafter collectively referred to as "Government Property."

(c) Title to the Government Property shall not be affected by the incorporation or attachment thereof to any property not owned by the Government, nor shall such Government Property, or any part thereof, be or become a fixture or lose its identity as personality by reason of affixation to any realty. The Contractor shall maintain adequate property control records of the Government Property and shall identify the Government Property as such in accordance with the provisions of the "Manual for Control of Government Property in Possession of Contractors" dated March 1951, which is incorporated herein by reference.

(d) The Government Property provided or furnished pursuant to the terms of this contract shall, unless otherwise provided herein, be used only for the performance of this contract.

(e) The Contractor shall maintain and administer in

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accordance with sound industrial practice, a program for the maintenance, repair, protection and preservation of Government Property so as to assure its full availability and usefulness for the performance of this contract. The Contractor shall take all reasonable steps to comply with all appropriate directions or instructions which the Contracting Officer may prescribe as reasonably necessary for the protection of Government Property.

(f) (i) The Contractor shall not be liable for any loss of or damage to the Government Property, or for expenses incidental to such loss or damage, except that the Contractor shall be responsible for any such loss or damage (including expenses incidental thereto) (A) which results from willful misconduct or lack of good faith on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (I) all or substantially all of the Contractor's business, or (II) all or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed, or (III) a separate and complete major industrial operation in connection with the performance of this contract; or (B) which results from a failure on the part of the Contractor, due to the willful misconduct or lack of good faith on the part of any of its directors, officers, or other representatives mentioned in subparagraph (A) above, to maintain and administer, in accordance with sound industrial practice, the program for maintenance, repair, protection and preservation of Government Property as required by paragraph (e) hereof, or which results from a failure on the part of the Contractor to take all reasonable steps to comply with any appropriate written directions of the Contracting Officer under paragraph (e) hereof; or (C) for which the Contractor is otherwise responsible under the clause or clauses designated in the Schedule; or (D) which results from a risk expressly required to be insured under this contract, but only to the extent of the insurance so required to be procured and maintained, or to the extent of insurance actually procured and maintained, whichever is greater; or (E) which results from a risk which is in fact covered by insurance or for which the Contractor is otherwise reimbursed, but only to the extent of such insurance or reimbursement; provided that, if more than one of the above exceptions shall be applicable in any case, the Contractor's liability under any one exception shall not be limited by any other exception.

(ii) The Contractor shall not be reimbursed for, and shall not include as an item of overhead, the cost of insurance, or any provision for a reserve, covering the risk of loss of or damage to the Government Property, except to the extent that the Government may have required the Contractor to carry such insurance under any other provision of this contract.

(iii) Upon the happening of loss or destruction of or damage to the Government Property, the Contractor shall notify the Contracting Officer thereof, and shall communicate with the Loss and Salvage Organization, if any, now or hereafter designated by the Contracting Officer, and with the assistance of the Loss and Salvage Organization so designated (unless the Contracting Officer has designated that no such organization be employed), shall take all reasonable steps to protect the Government Property from further damage, separate the damaged and undamaged Government property, put all the Government Property in the best possible order, and furnish to the Contracting Officer a statement of (A) the lost, destroyed and damaged Government Property, (B) the time and origin of the loss, destruction or damage, (C) all known interests in commingled property of which the Government Property is a part, and (D) the insurance, if any, covering any part of or interest in such commingled property. The Contractor shall make repairs and renovations of the damaged Government Property or take such other action, as the Contracting Officer directs.

(iv) In the event the Contractor is indemnified, reimbursed, or otherwise compensated for any loss or destruction of or damage to the Government property, it shall use the proceeds to repair, renovate, or replace the Government Property involved, or shall credit such proceeds against the cost of the work covered by the contract, or shall otherwise reimburse the Government, as directed by the Contracting Officer. The Contractor shall do nothing to prejudice the Government's right to recover against third parties for any such loss, destruction or damage and, upon the request of the Contracting Officer, shall, at the Government's expense, furnish to the Government all reasonable assistance and cooperation (including the prosecution of suit and the execution of instruments of assignment in favor of the Government) in obtaining recovery.

(g) The Government shall at all reasonable times have access to the premises where any of the Government Property is located.

(h) The Government Property shall remain in the possession of the Contractor for such period of time as is required for the performance of this contract unless the Contracting Officer determines that the interests of the Government require removal of such property. In such case the Contractor shall promptly take such action as the Contracting Officer may direct with respect to the removal and shipping of Government Property. In any such instance, the contract may be amended to accomplish an equitable adjustment in the terms and provisions thereof.

(i) Upon the completion of this contract, or at such earlier date as may be fixed by the Contracting Officer, the Contractor shall submit to the Contracting Officer in a form acceptable to him, inventory schedules covering all items of the Government Property not consumed in the performance of this contract (including any resulting scrap), or not theretofore delivered to the Government, and shall deliver or make such other disposal of the Government Property as may be directed by the Contracting Officer. Recoverable scrap shall be reported in accordance with a procedure and in such form as the Contracting Officer may direct. The net proceeds of any such disposal approved by the Contracting Officer shall be credited to the cost of the work covered by the contract or shall be paid in such manner as the Contracting Officer may direct.

(j) Unless otherwise provided herein, the Government shall not be under any duty or obligation to restore or rehabilitate, or to pay the costs of the restoration or rehabilitation of the Contractor's plant or any portion thereof which is affected by the removal of any Government Property.

(k) Directions of the Contracting Officer an... ratio... shall ... 20... (a)... tain... prehe...

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hensive automobile liability (bodily injury ... damage) insurance, with respect to performa... contract, and such other insurance as th... Officer* may from time to time require with respect to performance under this contract; *Provided*, That the Contractor in fulfillment of its obligation to procure workmen's compensation insurance may, with the approval of the ...give the Government or its ...otice of any suit or action ...claim made, against the Con... formance of this contract, the ... may be reimbursable to the ...ns of this contract, and the ...red or in which the amount ...f coverage. The Contractor ... the Government copies of all ...y the Contractor. If the ...limited exceeds the amount of coverage, the Contractor shall authorize representatives of the Government to collaborate with counsel for the insurance carrier, if any, in settling or defending such claim. If the liability is not insured or covered by bond, the Con-

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(k) Directions of the Contracting Officer and communications of the Contractor issued pursuant to this clause shall be in writing.

20. INSURANCE—LIABILITY TO THIRD PERSONS

(a) The Contractor shall procure and thereafter maintain workmen's compensation, employer's liability, comprehensive general liability (bodily injury) and comprehensive automobile liability (bodily injury and property damage) insurance, with respect to performance under this contract, and such other insurance as the Contracting Officer* may from time to time require with respect to performance under this contract; *Provided*, That the Contractor in fulfillment of its obligation to procure workmen's compensation insurance may, with the approval of the Contracting Officer* and pursuant to statutory authority, maintain a self-insurance program. All insurance required pursuant to the provisions of this paragraph shall be in such form, in such amounts, and for such periods of time, as the Contracting Officer* may from time to time require or approve, and with insurers approved by the Contracting Officer.*

(b) The Contractor agrees, to the extent and in the manner required by the Contracting Officer,* to submit for the approval of the Contracting Officer* any other insurance maintained by the Contractor in connection with the performance of this contract and for which the Contractor seeks reimbursement hereunder.

(c) The Contractor shall be reimbursed: (I) for the portion allocable to this contract of the reasonable cost of insurance as required or approved pursuant to the provisions of this clause, and (II) for liabilities to third persons for loss of or damage to property (other than property (A) owned, occupied, or used by the Contractor or rented to the Contractor or (B) in the care, custody, or control of the Contractor), or for death or bodily injury, not compensated by insurance or otherwise, arising out of the performance of this contract, whether or not caused by the negligence of the Contractor, its agents, servants, or employees, provided such liabilities are represented by final judgments or by settlements approved in writing by the Government, and expenses incidental to such liabilities, except liabilities (I) for which the Contractor is otherwise responsible under the express terms of the clause or clauses, if any, specified in the Schedule, or (II) with respect to which the Contractor has failed to insure as required or maintain insurance as approved by the Contracting Officer* or (III) which results from willful misconduct or lack of good faith on the part of any of the Contractor's directors or officers, or on the part of any of its managers, superintendents, or other equivalent representatives, who has supervision or direction of (1) all or substantially all of the Contractor's business, or (2) all or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed, or (3) a separate and complete major industrial operation in connection with the performance of this contract. The foregoing shall not restrict the right of the Contractor to be reimbursed for the cost of insurance maintained by the Contractor in connection with the performance of this contract, other than insurance required to be submitted for approval or required to be procured and maintained pursuant to the provisions of this clause, provided such cost would constitute Allowable Cost under the clause of this contract entitled "Allowable Cost, Fixed Fee and Payment."

*In contracts of the Department of the Navy, read "the Department" in lieu of "the Contracting Officer."

(d) The Contractor shall give the Government or its representatives immediate notice of any suit or action filed, or prompt notice of any claim made, against the Contractor arising out of the performance of this contract, the cost and expense of which may be reimbursable to the Contractor under the provisions of this contract, and the risk of which is then uninsured or in which the amount claimed exceeds the amount of coverage. The Contractor shall furnish immediately to the Government copies of all pertinent papers received by the Contractor. If the amount of the liability claimed exceeds the amount of coverage, the Contractor shall authorize representatives of the Government to collaborate with counsel for the insurance carrier, if any, in settling or defending such claim. If the liability is not insured or covered by bond, the Contractor shall, if required, by the Government, authorize representatives of the Government to settle or defend any such claim and to represent the Contractor in or take charge of any litigation in connection therewith: *Provided, however*, That the Contractor may, at its own expense, be associated with the respresentatives of the Government in the settlement or defense of any such claim or litigation.

21. OFFICIALS NOT TO BENEFIT

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

22. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion to deduct from the contract price or consideration the full amount of such commission, percentage, brokerage, or contingent fee.

23. GRATUITIES

(a) The Government may, by written notice to the Contractor, terminate the right of the Contractor to proceed under this contract if it is found, after notice and hearing, by the Secretary or his duly authorized representative, that gratuities (in the form of entertainment, gifts, or otherwise) were offered or given by the Contractor, or any agent or representative of the Contractor, to any officer or employee of the Government with a view toward securing a contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performing, of such contract: *Provided*, That the existence of the facts upon which the Secretary or his duly authorized representative makes such findings shall be in issue and may be reviewed in any competent court.

(b) In the event this contract is terminated as provided in paragraph (a) hereof, the Government shall be entitled (I) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the contract by the Contractor, and (II) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs

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incurred by the Contractor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

24. EMPLOYMENT OF ALIENS

If this contract calls for furnishing or constructing aircraft, aircraft parts or aeronautical accessories, no aliens employed by the Contractor shall be permitted to have access to the plans or specifications, or the work under construction, or to participate in the contract trials, without the written consent beforehand of the Secretary or his duly authorized representative.

25. NEUTRALITY ACT OF 1939

If any of the supplies to be delivered under this contract are arms, ammunition, or implements of war, as listed in the current proclamation issued by the President pursuant to the Neutrality Act of 1939 (22 U. S. Code 452), the Contractor either (i) represents that it is properly registered under said Act and agrees to furnish satisfactory evidence thereof upon request, or (ii) represents that it is not subject to said Act and agrees to furnish satisfactory evidence thereof upon request.

26. RENEGOTIATION

(a) This contract is subject to the Renegotiation Act of 1951 (P. L. 9, 82nd Cong.) and shall be deemed to contain all the provisions required by Section 104 of said Act.

(b) The Contractor (which term as used in this clause means the party contracting to furnish the materials or perform the work required by this contract) agrees to insert the provisions of this clause, including this paragraph (b) in all subcontracts as required by Section 104 of the Renegotiation Act of 1951: *Provided*, That the Contractor shall not be required to insert the provisions of this clause in any subcontract of a class or type described in Section 106 (a) of the Renegotiation Act of 1951.

27. MILITARY SECURITY REQUIREMENTS

(a) The provisions of this clause shall apply to the extent that this contract involves access to security information classified "Top Secret," "Secret," or "Confidential."

(b) The Government shall notify the Contractor of the security classification of this contract and the elements thereof, and of any subsequent revisions in such security classification, by the use of a Security Requirements Check List (DD Form 254) and Appendage thereto (DD Form 254–1).

(c) To the extent the Government has indicated as of the date of this contract, or thereafter indicates, security classification under this contract as provided in paragraph (b) above, the Contractor shall safeguard all classified elements of this contract and shall provide and maintain a system of security controls within its own organization in accordance with the requirements of (i) the Department of Defense Industrial Security Manual for Safeguarding Classified Security Information as in effect on date of this contract, which Manual is hereby incorporated by reference and made a part of this contract, (ii) any amendments to said Manual required by the demands of national security as determined by the Government and made after the date of this contract, notice of which has been furnished to the Contractor by the Contracting Officer, and (iii) those provisions of written agreements entered into by the parties pertaining to the adaptation of the Manual to the Contractor's business.

(d) Designated representatives of the Government responsible for inspection pertaining to industrial security shall have the right to inspect at reasonable intervals the procedures, methods and facilities utilized by the contractor in complying with the requirements of the terms and conditions of this clause. Should the Government, through its authorized representative, determine that the Contractor has not complied with such requirements, the Government shall inform the Contractor in writing of the proper actions to be taken in order to effect compliance with such requirements.

(e) If, subsequent to the date of this contract, the security classifications or requirements under this contract are changed by the Government as provided in this clause, and if such change causes an increase or decrease in the estimated cost of performance of this contract, the estimated cost and fixed fee, shall, to the extent appropriate, be subject to an equitable adjustment. Any such equitable adjustment shall be accomplished in the manner set forth in the clause of this contract entitled "Changes."

(f) The Contractor agrees to insert, in all subcontracts hereunder which involve access to classified security information, provisions which shall conform substantially to the language of this clause, including this paragraph (f) but excluding paragraph (g) of this clause. The Contractor may insert in any such subcontract, and any such subcontract entered into thereunder may contain, in lieu of paragraph (e) of this clause, provisions which permit equitable adjustments to be made in the subcontract price or in the estimated cost and fixed fee of the subcontract, (as appropriate to the type of subcontract involved) on account of changes in security classifications or requirements made under the provisions of this clause subsequent to the date of the subcontract involved.

(g) The Contractor also agrees that it shall determine that any subcontractor proposed by it for the furnishing of supplies and services which will involve access to classified security information in the Contractor's custody has been granted an appropriate facility security clearance, which is still in effect, prior to being accorded access to such classified security information.

28. FILING OF PATENT APPLICATIONS

(a) While and so long as the subject matter of this contract is classified "Secret" or higher, the Contractor agrees that, before filing or causing to be filed a patent application disclosing any of said subject matter, it will refer the proposed application to the Contracting Officer for determination whether, for reasons of national security, such application should be kept secret or the issuance of a patent thereunder otherwise delayed, under pertinent statutes or regulations; and the Contractor agrees to observe any instructions given by the Contracting Officer in this regard, which instructions may include a direction not to file such application so long as the Contracting Officer considers that such filing would jeopardize national security. If the Contracting Officer directs the Contractor not to file such application, the Contractor may submit to the Contracting Officer a written request, addressed to the Secretary, for reconsideration of such direction, but pending action by the Secretary, the Contractor shall observe such instruction.

(b) While and so long as the subject matter of this contract is classified "Confidential" or higher, and if the Contracting Officer determines that there is no other practical means for maintaining the security of said subject

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matter, Govern in and said su tractor, held in t entire right, title and interest therein to the Co upon allowance of the said application and pay final fee, or (ii) upon the mailing of notice by th ing Officer to the Contractor that disclosure of matter of the application will no longer jeopardize security. Nothing contained in this paragraph shall (A) apply to any patent application assigned to the Government under any conv e and ...

cting periods and covering yalties in excess of $1,000) paid or to be paid to each all business, together with permit identification of the royalties are to be paid, in ll furnish the Contracting Government expense, an nents to Government business or to the work or supplies covered by this contract; reference to any such periodic royalty reports, previously furnished to any Government agency and covering the period of performance of this contract, shall constitute compliance

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matter, the Contractor agrees to assig[illegible]d convey to the Government upon request the entire right, title and interest in and to each United States patent application disclosing said subject matter and filed by or on behalf of the Contractor, the title to the assigned patent application to be held in trust by the Government, subject to reversion of the entire right, title and interest therein to the Contractor (I) upon allowance of the said application and payment of the final fee, or (II) upon the mailing of notice by the Contracting Officer to the Contractor that disclosure of the subject matter of the application will no longer jeopardize security. Nothing contained in this paragraph shall (A) apply to any patent application assigned to the Government under any other provision of this contract, or (B) enlarge or diminish the rights granted to or reserved by the Government or the Contractor with respect to said application or the invention covered thereby, except to the extent expressly provided in this clause.

(c) While and so long as the subject matter of this contract is classified "Confidential", the Contractor agrees to furnish to the Contracting Officer at the time of or prior to filing or causing to be filed a patent application disclosing any of said subject matter, a copy of such application for determination whether, for reasons of national security, such application should be kept secret or the issuance of a patent thereunder otherwise delayed under pertinent statutes or regulations; and the Contractor agrees to observe any instructions of the Contracting Officer in this regard.

29. Notice and Assistance Regarding Patent Infringement

(a) The Contractor agrees to report to the Contracting Officer, promptly and in reasonable written detail, each claim of patent infringement based on the performance of this contract and asserted against it, or against any of its subcontractors if it has notice thereof.

(b) In the event of litigation against the Government on account of any claim of infringement arising out of the performance of this contract or out of the use of any supplies furnished or construction work performed hereunder, the Contractor agrees that it will furnish to the Government, upon request, all evidence and information in its possession pertaining to the defense of such litigation. Such information shall be furnished at the expense of the Government except in those cases in which the Contractor has agreed to indemnify the Government against the claim being asserted.

30. Reporting of Royalties

If this contract is in an amount which exceeds $10,000, the Contractor agrees to report in writing to the Contracting Officer, during the performance of this contract and prior to its completion or final settlement, the amount of any royalties or royalty rates paid or to be paid by it directly to others in connection with the performance of this contract, together with the names and addresses of licensors to whom such payments are made and either the patent numbers involved or such other information as will permit identification of the patents or other basis on which royalties are to be paid. Where the Contractor's compliance with the foregoing reporting requirement is found by the Contracting Officer to be impracticable because of the size of the Contractor's business or because of the nature of its accounting procedures, the Contractor may furnish one or more reports, based on its establis[illegible] accounting periods and covering the entire contract period, of royalties in excess of $1,000 (if computed on an annual basis) paid or to be paid to each licensor on the Contractor's overall business, together with such other information as will permit identification of the patents or other basis on which royalties are to be paid, in which event the Contractor shall furnish the Contracting Officer, upon his request and at Government expense, an allocation of such royalty payments to Government business or to the work or supplies covered by this contract; reference to any such periodic royalty reports, previously furnished to any Government agency and covering the period of performance of this contract, shall constitute compliance with the reporting requirement of this clause.

31. Authorization and Consent

The Government hereby gives its authorization and consent (without prejudice to its rights of indemnification, if such rights are provided for in this contract) for all use and manufacture, in the performance of this contract or any part hereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract), of any patented invention (i) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract, or (ii) utilized in the machinery, tools or methods the use of which necessarily results from compliance by the Contractor or the using subcontractor with (a) specifications or written provisions now or hereafter forming a part of this contract, or (b) specific written instructions given by the Contracting Officer directing the manner of performance.

32. Copyright

(a) The Contractor agrees to and does hereby grant to the Government, and to its officers, agents and employees acting within the scope of their official duties, (i) a royalty-free, nonexclusive and irrevocable license to reproduce, translate, publish, use, and dispose of, and to authorize others so to do, all copyrightable material first produced or composed and delivered to the Government under this contract by the Contractor, its employees or any individual or concern specifically employed or assigned to originate and prepare such material; and (ii) a license as aforesaid under any and all copyrighted or copyrightable work not first produced or composed by the Contractor in the performance of this contract but which is incorporated in the material furnished under the contract, provided that such license shall be only to the extent the Contractor now has, or prior to completion or final settlement of the contract may acquire, the right to grant such license without becoming liable to pay compensation to others solely because of such grant.

(b) The Contractor agrees that it will exert all reasonable effort to advise the Contracting Officer, at the time of delivering any copyrightable or copyrighted work furnished under this contract, of any adversely held copyrighted or copyrightable material incorporated in any such work and of any invasion of the right of privacy therein contained.

(c) The Contractor agrees to report to the Contracting Officer, promptly and in reasonable written detail, any notice or claim of copyright infringement received by the Contractor with respect to any material delivered under this contract.

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ADDITIONAL GENERAL PROVISIONS

33. FEDERAL, STATE AND LOCAL TAXES

Except as otherwise provided in this contract, Federal, State and local taxes (other than (i) Federal taxes on income and excess profits, (ii) taxes in connection with financing, refinancing, or refunding operations, and (iii) Federal excise taxes from which exemption is obtainable under Sections 3442(1) and 3442(2) of the Internal Revenue Code or for which a credit is obtainable under Section 3403(e) thereof) paid by the Contractor or any cost or cost-plus-a-fixed-fee subcontractor hereunder (provided that there was no fixed-price subcontractor intervening between such subcontractor and the Contractor) and incident to the performance of this contract shall constitute items of allowable cost under this contract or such cost or cost-plus-a-fixed-fee subcontract if (i) the Contractor has requested the Department to furnish tax exemption certificates or other similar evidence of exemption for use by the Contractor and such cost or cost-plus-a-fixed-fee subcontractor in obtaining exemption from such Federal, State or local taxes and (ii) the Department has notified the Contractor that it will not furnish such evidence of exemption. Payments of taxes for which evidence of exemption has been furnished hereunder shall constitute items of Allowable Cost under this contract (i) if the Federal taxing authorities have refused to recognize such evidence of exemption or (ii) if the State or local taxing authorities have refused to recognize such evidence of exemption and the Contractor has notified the Contracting Officer of such refusal and has taken such steps as may have been requested by the Government to cause such taxes to be paid in such manner as to preserve all rights to refund thereof, to preserve and to cause to be assigned to the Government any and all rights to any refund of such taxes, to permit the Government to prosecute any claims, litigation or proceeding in the name of the Contractor, and to furnish to the Government all reasonable assistance and cooperation requested by the Government in the prosecution of any such claim, litigation or proceeding for the recovery of such taxes.

34. PAYMENT OF ROYALTIES

Payments by the Contractor of any sum for royalties or patent rights not included in the ordinary purchase price of standard commercial supplies shall not constitute items of Allowable Cost hereunder, unless and until approved by the Contracting Officer. Reimbursement to the Contractor on account of any such payments shall not be construed as an admission by the Government of the enforceability, validity or scope of, or title to any of the patents involved, nor shall any such reimbursement constitute a waiver of any rights or defenses respecting such patents.

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35. REPRODUCTION RIGHTS

The Contractor agrees to and does hereby grant to the Government, to the full extent of the Contractor's right to do so without payment of compensation to others, the right to reproduce, use and disclose for governmental purposes (including the right to give to foreign governments for their use as the national interest of the United States may demand) all or any part of the reports, drawings, blueprints, data and technical information specified to be delivered by the Contractor to the Government under this contract; provided, however, that nothing contained in this paragraph shall be deemed directly or by implication to grant any license under any patent now or hereafter issued or to grant any right to reproduce anything else called for by this contract.

36. BILL OF MATERIALS

If the schedule provides for the delivery of a Bill of Materials, the following provisions shall apply:

(a) With respect to the supplies to be delivered pursuant to the contract for which a Bill of Materials is required, the Contractor shall furnish a Bill of Materials in the required number of copies on Department of Defense Forms 346 and 347 in accordance with the instructions contained in such forms which are hereby incorporated by reference in this contract.

(b) Except as otherwise provided in this contract, the Bill of Materials shall be delivered not later than thirty (30) days after the first delivery of any supplies to be delivered pursuant to this contract for which a Bill of Materials is required.

(c) When changes, made pursuant to the clause of this contract entitled "Changes", affect the quantity of any material or part described in the Bill of Materials or require a revision of any other information contained therein, the Contractor shall, during performance of the contract, furnish to the Contracting Officer, every four months after delivery of the Bill of Materials, revised pages of the Bill of Materials, incorporating the effect of such changes, or a statement that no revisions are necessary. The statement need not be furnished for any four month period during which no change under the "Changes" clause is made. A final revision or statement that no revisions are necessary shall be furnished upon completion of performance of the contract.

(d) The Bill of Materials and all revisions and statements subsequent thereto shall be subject to inspection and acceptance by the Contracting Officer.

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37. MARKING OF SHIPMENTS

The Contractor shall mark all its shipments of equipment produced under this contract in accordance with the edition of "Military Standard Marking of Shipments" (MIL-STD-129), issued by the Department of Defense, in effect at the time of shipment. The applicable lot or item number, or both, shall be included in the markings prescribed for each shipment in addition to the contract number.

38. NOTICE OF SHIPMENT

Whenever a shipment of a carload or truckload lot is tendered to a carrier hereunder (regardless of whether the shipment is moving on a commercial or Government bill of lading), the Contractor shall send a prepaid telegram to the consignee the same day, giving the following information: contract or order number; date of shipment; brief description of the commodity and how packed; weight in pounds and number of pieces; government or commercial bill of lading number; route order number, if applicable; complete routing including car number (s) and initials if by rail, or number of truckloads if by truck; and ultimate destination if to be transshipped. Airmail notice, in lieu of a telegram, may be sent on such shipments destined to a consignee over 1,000 air miles from the Contractor's plant.

39. GENERAL ORDNANCE REQUIREMENTS

Ordnance Pamphlet No. 400, revision in effect at the date of this contract, shall form a part of the specifications applicable to this contract.

40. GENERAL SPECIFICATIONS FOR THE INSPECTION OF MATERIAL

There is hereby incorporated in and made a part of this contract that edition (including any revisions thereof) of "General Specifications for Inspection of Material", issued by the Navy Department, which is in effect on the date of this contract.

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PATENT RIGHTS

(a) As used in this clause, the following terms shall have the meanings set forth below:

(i) The term "Subject Invention" means any invention, improvement or discovery (whether or not patentable) conceived or first actually reduced to practice either (A) in the performance of the experimental, developmental, or research work called for or required under this contract, or (B) in the performance of any experimental, developmental, or research work relating to the subject matter of this contract which was done upon an understanding in writing that a contract would be awarded; provided, that the term "Subject Invention" shall not include any invention which is specifically identified and listed in the Schedule for the purpose of excluding it from the license granted by this clause.

(ii) The term "Technical Personnel" means any person employed by or working under contract with the Contractor (other than a subcontractor whose responsibilities with respect to rights accruing to the Government in inventions arising under subcontracts are set forth in paragraphs (g), (h), and (i) of this clause) who, by reason of the nature of his duties in connection with the performance of this contract, would reasonably be expected to make inventions.

(iii) The terms "subcontract" and "subcontractor" mean any subcontract or subcontractor of the Contractor, and any lower-tier subcontract or subcontractor under this contract.

(b) The Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, nontransferable, and royalty-free license to practice, and cause to be practiced by or for the United States Government throughout the world, each Subject Invention in the manufacture, use and disposition according to law, of any article or material, and in the use of any method; provided, however, that with respect to (i) any Subject Invention made by other than Technical Personnel, (ii) any Subject Invention conceived prior to, but first actually reduced to practice in the course of, any of the experimental, developmental, or research work specified in paragraph (a) (i) above, and (iii) the practice of any Subject Invention in foreign countries, the obligation of the Contractor to grant the aforesaid license and the other rights hereinafter provided in this clause shall be limited to the extent of the Contractor's right to grant the same without incurring any obligation to pay royalties or other compensation to others solely on account of said grant. No license granted herein shall convey any right to the Government to manufacture, have manufactured, or use any Subject Invention for the purpose of providing services or supplies to the general public in competition with the Contractor or the Contractor's commercial licensees in the licensed fields. Nothing contained in this paragraph shall be deemed to grant any license under any invention other than a Subject Invention.

(c) The Contractor shall:

(i) Make a written disclosure to the Contracting Officer promptly after conception or first actual reduction to practice of each Subject Invention which reasonably appears to be patentable;

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(ii) Certify to the Contracting Officer not less often than every twelve months, commencing with the date of this contract, whether or not any Subject Inventions were conceived or first actually reduced to practice during the preceding twelve months; and

(iii) Prior to final settlement of this contract, make a summary report of all those Subject Inventions previously disclosed and of those Subject Inventions conceived or first actually reduced to practice after the last certification but prior to the summary report.

(d) The Contractor shall also, inconnection with each Subject Invention referred to in paragraph (c) (i) above:

(i) Specify, at the time of making written disclosure, whether or not a United States patent application claiming such Invention has been or will be filed by or on behalf of the Contractor. If the Contractor specifies that a United States patent application will be filed claiming such Invention, the Contractor shall file or cause to be filed such application in due form and time. If the Contractor decides not to file or cause to be filed said application after having specified that it would file, the Contractor shall so notify the Contracting Officer at the earliest practicable date and in any event not later than eight months after first publication, public use or sale;

(ii) In the event the Contractor specifies that it has not filed and will not file (or having specified that it will file, thereafter notifies the Contracting Officer to the contrary), (A) inform the Contracting Officer in writing at the earliest practicable date of any publication of such Invention made by or known to the Contractor or, where applicable, of any contemplated publication by the Contractor, stating the date and identity of such publication or contemplated publication, and (B) convey to the Government the Contractor's entire right, title and interest in such Invention by delivering to the Contracting Officer upon written request such duly executed instruments (prepared by the Government) of assignment, application and other papers as are deemed necessary to vest in the Government the Contractor's right, title and interest aforesaid, and the right to apply for and prosecute patent applications covering such Invention throughout the world, subject, however, to the right reserved to the Contractor in paragraph (e) to file foreign applications, and subject further to the reservation of a nonexclusive and royalty-free license to the Contractor (and to its existing and future associated and affiliated companies, if any, within the corporate structure of which the Contractor is a part) which license shall be assignable to the successor or that part of the Contractor's business to which the Subject Invention pertains;

(iii) Furnish promptly to the Contracting Officer on request an irrevocable power of attorney to inspect and make copies of each United States patent application filed by or on behalf of the Contractor covering any Subject Invention;

(iv) In the event the Contractor, or those deriving rights from the Contractor, elects not to continue prosecution of any such United States patent application filed by or on behalf of the Contractor, so notify the Contracting Officer not less than sixty days before the expiration of the response period and, upon written request, deliver to the Contracting Officer such duly executed instruments (prepared by the Government) as are deemed necessary to vest in the Government the Contractor's entire right, title and interest in the Subject Invention and the application, subject to the reservations as specified in (ii) above; and

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(v) Deliver to the Contracting Officer duly executed instruments fully confirmatory of any license rights herein agreed to be granted to the Government.

(e) The Contractor, or those deriving rights from the Contractor, has the option of filing patent applications in foreign countries on Subject Inventions. If this option is not exercised in the time and manner set forth below, the Government shall have the right to file applications in each foreign country in which the Contractor has not exercised its option.

(i) In the event that the Contractor specifies under the provisions of paragraph (d) that it has not filed and will not file a United States patent application (or having specified that it will file, thereafter notifies the Contracting Officer to the contrary) the Contractor shall have six months from the date of making the written disclosure required by paragraph (c) (i) to file foreign patent applications.

(ii) In the event that a United States patent application is filed by or on behalf of the Contractor under the provisions of paragraph (d), the Contractor shall have six months from the date of the United States application, or six months from the date permission is granted to file foreign applications where such filing has been prohibited for security reasons, within which to file foreign patent applications. With respect to each Subject Invention on which it has specified that a United States patent application has been or will be filed by or on behalf of the Contractor, the Contractor shall (A) inform the Contracting Officer in writing of each foreign patent application for such Invention filed by or on behalf of the Contractor within six months after the filing by the Contractor of the corresponding United States application, and, if practicable, prior to the publication of the Subject Invention in any country, (B) inform the Contracting Officer in writing at the earliest practicable date of any publication of the Subject Invention made by or known to the Contractor or, where applicable, of any contemplated publication by the Contractor, stating the date and identity of such publication or contemplated publication, (C) upon written request of the Contracting Officer, convey to the Government the Contractor's entire right, title, and interest in such Invention in those countries in which the Contractor has not, within six months after the filing of the corresponding United States application, filed foreign patent applications, and deliver to the Contracting Officer, upon written request, such duly executed instruments (prepared by the Government) of assignment, application, and other papers as are deemed necessary to vest in the Government the Contractor's right, title, and interest as aforesaid and the right to apply for and maintain patents covering such invention, subject, however, to the reservation of a nonexclusive and royalty-free license to the Contractor (and to its existing and future associated and affiliated companies, if any, within the corporate structure of which the Contractor is a part) which license shall be assignable to the successor of that part of the Contractor's business to which the Subject Invention pertains, and (D) in the event that the Contractor, or those deriving rights from the Contractor, elects not to continue the prosecution of any foreign application which has been filed by or on behalf of the Contractor, or elects not to maintain any patent granted on such application, so notify the Contracting Officer not less than ninety days before the expiration of the response period or patent lapse date and, upon written request, deliver to the Contracting Officer such duly executed instruments (prepared by the Government) as will convey to the Government the Contractor's entire right, title, and interest in the application or patent, subject to a reservation as specified in (C) above.

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(f) If the Contractor fails to deliver to the Contracting Officer the certificates required by paragraph (c)(ii) of this clause or fails to furnish the written disclosures for all Subject Inventions required by paragraph (c)(i) of this clause shown to be due in accordance with any certificate delivered under paragraph (c)(ii), there shall be withheld from payment until the Contractor shall have corrected such failures either (i) ten percent (10%) of the amount of this contract, as from time to time amended, or (ii) $5,000, whichever is less. After payment of eighty percent (80%) of the amount of this contract, as from time to time amended, payment shall be withheld until a reserve of either (i) ten percent (10%) of such amount, or (ii) $5,000, whichever amount is less, shall have been set aside, such reserve or balance thereof to be retained until the Contractor shall have furnished to the Contracting Officer (A) the summary report required by paragraph (c)(iii) of this clause, (B) written disclosures for all Subject Inventions required by paragraph (c)(i) of this clause which are shown to be due in accordance with certificates delivered under paragraph (c)(ii) or in accordance with such summary report, and (C) the information as to any subcontractor required by paragraph (h) of this clause. The maximum amount which may be withheld under this paragraph shall not exceed ten percent (10%) of the amount of this contract or $5,000, whichever is less, and no amount shall be withheld under this paragraph when the minimum amount specified by this paragraph is being withheld under other provisions of this contract. The withholding of any amount or subsequent payment thereof to the Contractor shall not be construed as a waiver of any rights accruing to the Government under this contract. This paragraph shall not be construed as requiring the Contractor to withhold any amounts from a subcontractor to enforce compliance with the patent provisions of a subcontract.

(g) The Contractor shall exert all reasonable effort to negotiate for the inclusion of this Patent Rights clause in any subcontract hereunder of $3,000 or more having experimental, developmental, or research work as one of its purposes. In the event of refusal by a subcontractor to accept the Patent Rights clause, the Contractor shall not proceed with the subcontract without written authorization of the Contracting Officer, and upon obtaining such authorization, shall cooperate with the Government in the negotiation with such subcontractor of an acceptable patent rights clause; provided, however, that the Contractor shall in any event require the subcontractor to grant to the Government patent rights under Subject Inventions of no less scope and on no less favorable terms than those which the Contractor has under such subcontracts, except that in no event shall the subcontractor be required to grant to the Government patent rights in excess of those herein agreed to be granted to the Government by the Contractor.

(h) The Contractor shall, at the earliest practicable date, notify the Contracting Officer in writing of any subcontract containing a patent rights clause, furnish the Contracting Officer a copy of such clause, and notify the Contracting Officer when such subcontract is completed. It is understood that with respect to such subcontract clause, the Government is a third party beneficiary; and the Contractor hereby assigns to the Government all the rights that the Contractor would have to enforce the subcontractor's obligations for the benefit of the Government with respect to Subject Inventions. The Contractor shall not be obligated to enforce the agreements of any subcontractor hereunder relating to Subject Inventions.

(i) When the Contractor shows that it has been delayed in the performance of this contract by reason of its inability to obtain in accordance with paragraph (g) a suitable patent rights clause from a qualified subcontractor for any item or service required under this contract for which the Contractor itself does not have

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available facilities or qualified personnel, the Contractor's delivery dates shall be extended for a period of time equal to the duration of such delay; and, upon request of the Contractor, the Contracting Officer shall determine to what extent, if any, an additional extension of the delivery dates and an increase in contract prices based upon additional costs incurred by such delay are proper under the circumstances; and the contract shall be modified accordingly. If the Contractor, after exerting all reasonable effort, is unable to obtain a qualified subcontractor as set forth above, the Contractor may submit to the Contracting Officer a written request for waiver or modification of the requirement that a suitable patent rights clause be included in the subcontract Such request shall specifically state that the Contractor has used all reasonable effort to obtain such qualified subcontractor, and shall cite the waiver or termination provision hereinafter set forth. If, within thirty-five (35) days after the date of receipt of such request for a waiver or modification of said requirement, the Contracting Officer shall fail to deny in writing such request, the requirement shall be deemed to have been waived by the Government. If within such period the Contractor shall receive a written denial of such request by the Contracting Officer, this contract shall thereupon automatically terminate and the rights and obligations of the parties shall be governed by the provisions of the clause of this contract entitled "Termination" or "Termination for the Convenience of the Government", as the case may be.

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Financial Status Report:

(1) The Contractor shall prepare and submit Financial Status Report of Contracts (NAVEXOS Form 3890) in accordance with instructions contained therein.

(2) The report shall be submitted quarterly, in quadruplicate, to the Chief, Bureau of Ordnance, via the cognizant Inspector.

(3) The report is to be submitted on the 15th day of each third month beginning with the third month following the month in which the requirement for the report was initiated and ending when all work under the contract has been completed.

(4) The Financial Status Report of Contracts is required for administrative purposes only, and the acceptance by the Government of said information and data shall not constitute a waiver by the Government of any rights or remedies whatsoever provided by law or under this contract.

Financial Status Report
QUARTERLY (4/55)

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PRIORITIES, ALLOCATIONS AND ALLOTMENTS

The Contractor agrees, in the procurement and use of materials required for the performance of this contract, to comply with the provisions of all applicable rules and regulations in the Business and Defense Services Administration, including Defense Materials System regulations.

Priorities, Allocations and Allotments

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The rights and obligations of the parties to this contract shall be subject to and governed by the Schedule and the General Provisions. To the extent of any inconsistency between the Schedule or the General Provisions, and any specifications or other provisions which are made a part of this contract by reference or otherwise, the Schedule and the General Provisions shall control. To the extent of any inconsistency between the Schedule and the General Provisions, the Schedule shall control.

The Contractor represents that the aggregate number of employees of the Contractor and its affiliates is: ☒ 500 or more, ☐ less than 500.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written:

Executed by Contracting Officer on 2/17/66 [illegible] to execution by the contractor.

THE UNITED STATES OF AMERICA

By [signature]

R. W. LaPLANTE
Lieutenant (SC), [illegible]
Contracting Officer
(CONTRACTING OFFICER)

WITNESSES

National Fireworks Ordnance Corporation
(CONTRACTOR)

By [signature]

NOTE.—In case of corporation, witnesses not required but certificate below must be completed. Type or print names under all signatures.

Hubert H. Wolfert - Vice President

(TITLE)

West Hanover, Massachusetts
(ADDRESS)

NOTE.—Contractor, if a corporation, should cause the following certificate to be executed under its corporate seal, provided that the same officer shall not execute both the contract and the certificate.

CERTIFICATE

I, Alton A. Borland, certify that I am the Assistant Clerk of the corporation named as Contractor herein; that Hubert H. Wolfert, who signed this contract on behalf of the Contractor, was then Vice President of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

[signature] (CORPORATE SEAL)
Alton A. Borland (SIGNATURE) Assistant Clerk

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The First National Bank of Boston
Boston 6, Massachusetts

Attn: Factoring & Commodity Department

Subj: Notice of Release of Assignment of Claims with National Fireworks Ordnance Corporation

Gentlemen:

Receipt is acknowledged of your Notices of Release of Assignment dated 21 and 22 March 1957 with regard to Release of Assignment of Claims under the following contracts made by the United States of America, Navy Department, Bureau of Ordnance, with National Fireworks Ordnance Corporation:

Contract NOrd-	Date of Contract	Date of Notice
10975	20 Jun 1950	21 Mar 1957
11393	28 Feb 1951	"
11786	6 Jun 1951	"
12192	22 Oct 1951	"
12382	1 Feb 1952	"
12615	1 Apr 1952	22 Mar 1957
12846	1 Jun 1952	"
13027	16 Jun 1952	"
13431	28 Oct 1952	"
13684	30 Jan 1953	"
13694	1 Mar 1953	"
14250	30 Jun 1953	"
14576	12 Jan 1954	"
15502	30 Nov 1954	"
15525	13 Dec 1954	"
15797	1 Mar 1955	"
15867	1 Apr 1955	"
16643	9 Nov 1955	"
16775	25 Jan 1956	"

Sincerely yours,

R. W. LaFLANTE
Lieutenant (SC), USN
Contracting Officer

Encl:
(1) 3 Copies of Notice of Release under Contr NOrd-10975,11393, 11786, 12192,12382
(2) 3 Copies of Notice of Release under Contr NOrd-12615, 12846,13027,13431,13684
(3) 3 Copies of Notice of Release under Contr NOrd-13694,14250,14576,15502,15525
(4) 3 Copies of Notice of Release under Contr NOrd-15797,15867,16643,16775
Copy to: Fi (w/encl) Nord 16775
Adlb
Prep 3/28/57
Ext 64671

Wolfert
EXHIBIT NO. 6
6-24-97
MICHELLE SYLVIA

DECLASSIFIED
Authority NND 973032
By MW NARA Date 9/3/97

RG 402
Acc.# 66L4506
Box 23
Fr "Contract No. Nord 16775
dated 25 January 1956 ..."

RODUCED AT THE NATIONAL ARCHIVES

NOTICE OF RELEASE OF ASSIGNMENT

March 22, 1957

TO: Contracting Officer
Bureau of Ordnance
Washington 25, d.c.

RE: Contract made between the NAVY Department of the United States of America and NATIONAL FIREWORKS ORDNANCE CORPORATION WEST HANOVER, MASSACHUSETTS providing for RESEARCH & DEVELOPMENT:

Contract Number	Contract Date
NORD-15797	March 1, 1955
NORD-15867	April 1, 1955
NORD-16643	November 9, 1955
NORD-16775	January 25, 1956

PLEASE TAKE NOTICE that any and all assignments of monies due or to become due and/or rights under the above contracts heretofore made to The First National Bank of Boston, Boston, Massachusetts, have been cancelled, are of no further force and effect and have been released to NATIONAL FIREWORKS ORDNANCE CORPORATION , by The First National Bank of Boston.

A duplicate original of the Release of Assignment is attached hereto.

Payments due or to become due under said contracts should hereafter be made to NATIONAL FIREWORKS ORDNANCE CORPORATION or as directed by NATIONAL FIREWORKS ORDNANCE CORPORATION.

Please return to the under signed the three enclosed duplicate originals of this notice with appropriate notations showing the date and hour of receipt, and duly signed by the person acknowledging receipt on behalf of the addressee.

Very truly yours

THE FIRST NATIONAL BANK OF BOSTON

BY _____
Authorized Official
67 Milk Street
Boston 6, Massachusetts

Receipt is hereby acknowledged of the above notice and a copy of the above mentioned release of assignment. These were received at 10:00 a.m. on 27 March, 1957.

Original Filed in
Fi' File NOrd 15797

ON BEHALF OF:

R. W. L...
Lieutenant (jg), USN
Contracting Officer

Encl (4)

DECLASSIFIED
Authority NM 97 3032
By NARA Date 4/3/97

RG 402
Acc. # 66 L 450G
Box 23
Fr "Contract No. Nord 16775
dated 25 January, 1956 ..."

RODUCED AT THE NATIONAL ARCHIVES

RELEASE OF ASSIGNMENT OF MONIES DUE OR TO
BECOME DUE UNDER U. S. GOVERNMENT CONTRACTS

WHEREAS NATIONAL FIREWORKS ORDNANCE CORPORATION, a corporation organized under the laws of the State of MASSACHUSETTS, having a usual place of business in WEST HANOVER MASSACHUSETTS, (hereinafter called the "Borrower") assigned to The First National Bank of Boston, Boston, Massachusetts, (hereinafter called the "Bank") all claims for monies due or to become due under the following described contracts with Dept. of the NAVY, BUREAU OF ORDNANCE, WASHINGTON 25, D. C.:

Number	Date of Contract	Date of Assignment
NORD-15797	March 1, 1955	May 11, 1955
NORD-15867	April 1, 1955	August 16, 1955
NORD-16643	November 9, 1955	January 26, 1956
NORD-16775	January 25, 1956	March 21, 1956

NOW, THEREFORE, for valuable consideration paid by the Borrower to the Bank, the receipt of which is hereby acknowledged, it is agreed that any and all assignments of monies due and to become due and rights under the above-mentioned contracts and any and all amendments thereof and supplements thereto, are as of this date cancelled and of no further force and effect and the Bank hereby releases and reassigns to the Borrower any and all rights it has under said contracts and consents to the payment by the United States of America of the proceeds of said contracts directly to the Borrower or as may be directed by the Borrower.

IN WITNESS WHEREOF The First National Bank of Boston, Boston, Massachusetts, has caused these presents to be signed and its corporate seal to be hereto affixed by its officers hereunto duly authorized on this 21st day of March, 1957.

THE FIRST NATIONAL BANK OF BOSTON

BY [signature]
Vice President

ATTEST:

[signature]
Cashier

DECLASSIFIED
Authority NND 973032
By LMD NARA Date 4/3/77

RG 402
Acc. # 66L4506
Box 23
Fr "Contract No. Nord 16775
dated 25 January, 1956 ..."

REPRODUCED AT THE NATIONAL ARCHIVES

PAGE 1 OF

STANDARD FORM 120 REV. APRIL 1957 PRESCRIBED BY GSA REG. 1-III.302.00

REPORT OF EXCESS PERSONAL PROPERTY

1. REPORT NO.	2. DATE MAILED	3. TOTAL COST
N-320a-94466-61	17 July 1961	$ 31,469.45

4. TYPE OF REPORT (Check one only of "a," "b," "c," or "d"): [ ] a. ORIGINAL [X] b. CORRECTED [ ] c. PARTIAL W/D [ ] d. TOTAL W/D (Also check "e" and/or "f" if appropriate) [ ] e. OVERSEAS [X] f. CONTRACTORS INV

5. TO (Name and Address of Agency to which report is made) THRU

Superintendent, U.S. Naval Weapons Plant
Washington 25, D. C. Attn: Code 59500

Chief, Bu Ships

6. APPROP. OR FUND TO BE REIMBURSED (If any)

7. FROM (Name and Address of Reporting Agency)

Inspector of Naval Material
495 Summer Street, Boston, Massachusetts

8. REPORT APPROVED BY (Name and Title)

P. J. KREPS
Contr. Term. Dir. NORD 14250

9. FOR FURTHER INFORMATION CONTACT (Title, Address and Telephone No.)

D. M. Anderson, Supervisor Inventory Processing Division
Inspector of Naval Material, Boston LI2-5100 Ext. 548

10. AGENCY APPROVAL (If applicable)

Nord 14250

11. SEND PURCHASE ORDERS OR DISPOSAL INSTRUCTIONS TO (Title, Address and Telephone No.)

Same as Block 9

12. GSA CONTROL NO.

(FSSC)

13. FSC GROUP NO.	14. LOCATION OF PROPERTY (If location is to be abandoned give date)	15. REIM/RECD YES	15. REIM/RECD NO	16. AGENCY CONTROL NO.	17. SURPLUS RELEASE DATE
-	American Potash & Chemical Corporation West Hanover, Massachusetts		X		

18. EXCESS PROPERTY LIST

ITEM NO. (a)	DESCRIPTION (b)	COND. (c)	UNIT (d)	NUMBER OF UNITS (e)	ACQUISITION COST PER UNIT (f)	ACQUISITION COST TOTAL (g)	FAIR VALUE % (h)
	CONTRACTOR INVENTORY * * * Amended Report Original S.F. 120 dtd 28 June 1961 The following data extracted from Resident Ordnance Inspector's Verification Report is forwarded for ~~your review and advise~~. Items 1 thru 7 are dangerous Oxydying chemicals. Item 9 - Smokeless powder is a propellant explosive - Class "B". Item 10 - Tetryl is high explosive - Class "A". Item 20 - 20 m/m Loaded Class "A" - Good ammunition, occasionally used for reference ammo. Recommend abandonment at location without destruction. Item 22 - 50 cal. cartridge cases loaded - Class "C". Recommend that they be sold to the contractor to be used in conjunction with test firings to determine strength of materials when used with an Army rifle. All other items should be shipped to Crane NAD Indianna, Code 4100, if they can use them.						

7-17

072661 0151

STANDARD FORM 120 REV. APRIL 1957 EDITION (Use Standard Form 120A for Continuation Sheets)

☆ U. S. GOVERNMENT PRINTING OFFICE:1957-456811

DECLASSIFIED
Authority NND 971032
By LGJ NARA Date 7/1/97

Nolfi
EXHIBIT NO. 9
6-24-97
MICHELLE SYLVIA

RG 402
Acc. #64A 3436
Box 3
Fldr: NORD 14250 JAN-1

REPRODUCED AT THE NATIONAL ARCHIVES

ROUTE SHEET
NAVWEPS FORM 5211/1 (REV. 1-61)

DO NOT DETACH RECORD COPY

(Extra copies may be removed provided Route Sheet is retained for comment is made.)

17 AUG 1961

1. Route to those who have a need to know.

2. Designated action addressee is responsible for taking required action on the mail. If misrouted, he should ascertain the correct action desk, clear the change with the action desk, enter the code and Symbol "A" in appropriate columns below, forward mail, and notify DOS-332 (X64463) of the change in routing.

ROUTING PURPOSE SYMBOLS

A— Action
C— Concurrence
I— Information
R— Recommendation
S— Signature
SC— See comments

ROUTE TO (Code)	FOR (Purpose)	DATE RECEIVED	DATE RELEASED	INITIALS	REMARKS (Comments shall be legibly written and followed by identifying code)
FSSC-6131	A	8/17/61	8/17/61	DoB	Action accomplished. See INS Hdqs Bates 8/17/61 Report No 320-94446-61 of 17 Aug 1961 NO2 14250 2-17-61 Ltr No 072661-0151 to Bartels X66420
~~RHHO 30~~	~~R~~				
FSSC-6131	A				

072661 0151

FINAL DISPOSITION (Must be completed before return to files.)

☒ ACTION COMPLETED ☐ NO ACTION REQUIRED

BY (Initials) DoB

ROUTE PINK COPY OF OUTGOING CORRESPONDENCE TO THE FOLLOWING IN THE ORDER INDICATED.

1.	3.
2.	4.

CONTINUE COMMENTS ON REVERSE

DECLASSIFIED
Authority NND 971032
By LGJL NARA Date 7/7/97

RG 402
Acc. # 64A 3436
Box 3

10902489

FEG/jml

ALL COMMU[illegible]IONS SHOULD BE ACCOMPANIED BY CARBON COPY AN[illegible]DRESSED TO

WAR DEPARTMENT
BOSTON ORDNANCE DISTRICT
ROOM 1501, 140 FEDERAL STREET
BOSTON, MASS.

IN REPLY REFER TO
B.O.D. No. 319.1/87

February 26, 1941

Subject: Monthly Report - February

To: Chief of Ordnance
Washington, D. C.

ATTN: Industrial Service, District Control Division

1. Personnel.

1. Military Personnel

The following reserve officers reported for one year extended active duty:

Captain Philip A. Nelles, Jr., Ord-Res. February 12
2nd Lt. Robert A. Spence, Ord-Res. February 10

2nd Lt. Daniel Simonds, Ord-Res., was transferred from active duty status at this station to take up duties in the Chief of Ordnance office, effective February 21, 1941.

2nd Lt. J. P. Hurley, Ord-Res., assigned to this office was reported to have resigned his commission, effective January 8, 1941.

Capt. Alva M. Dow, Spec-Res., assigned to this District was transferred to Watertown Arsenal February 12, 1941.

Three of the five officers selected to fill duty vacancies authorized in January 9, 1941 directive O.O. 210/108 have completed and passed final type physical examinations. The remaining two have deferment until May 1, 1941, and their cases are temporarily held in abeyance.

2. Civilian Personnel

New appointments.

The following temporary appointments were made, pending reinstatement:

Charles T. Glidden, Assistant Clerk, CAF-3, effective Feb. 17, 1941
Miss Mary E. Sullivan, Under Clerk-Typist, CAF-1, effective Feb. 19, 1941.

2. Civilian Personnel (continued)

New appointments (continued)

	Date effective
Assistant Inspectors Ordnance Material, CAF-6	
John P. Fitzpatrick	2/10/41
Robert W. Anderson	2/17/41
Charles DeFazio	2/17/41
Milton Richmond	2/17/41
Joseph Sorrenti	2/17/41
Leonard H. Tomaselli	2/17/41
Bertrand H. Reynolds	2/24/41
Associate Inspectors Ordnance Material, CAF-5	
Frederick G. Myer	2/17/41
H. Lansing Rossire	2/17/41
Robert M. Franklin, Jr.	2/20/41
H. Kenneth Leete	2/24/41
Joseph P. Martin	2/24/41
John F. Roberts	2/25/41
Junior Engineering Aide, SP-3, Wm. K. Stroud	2/24/41

The following temporary appointments were discontinued and employees nominated for probational indefinite (emergency) appointment:

George L. Ladd, Assistant Inspector Ordnance Material, CAF-4, effective February 4, 1941.
Reginald P. Coor, Junior Engineer (Mechanical), P-1, effective February 6, 1941.

The services of Harold W. Hopkwood, Inspector Ordnance Material, CAF-5, were involuntarily terminated on February 7, 1941, in accordance with instructions from the U. S. Civil Service Commission through the office of the Chief of Ordnance.

The following resignation, without prejudice, was accepted:

Robert W. Anderson, Assistant Inspector Ordnance Material, CAF-4, effective February 20, 1941.

The promotion of Miss Helen Gallagher, from Junior Clerk-Stenographer, CAF-2, to the grade of Assistant Clerk-Stenographer, CAF-3, became effective on February 8, 1941.

2. Surveys (continued)

Resurveys

Anderson, Albert and J. H., Mfg. Co., Boston, Mass.
Buff and Buff Mfg. Co., Jamaica Plain, Mass.
Builders Iron Foundry, Providence, R. I.
Cambridge Screw Co., Cambridge, Mass.
Cowdrey Machine Works, Fitchburg, Mass.
Cummings Machine Co., Boston, Mass.
Hadley Special Tool Co., Boston, Mass.
Harrington and Richardson Arms Co., Worcester, Mass.
Hedstrom Union Co., Fitchburg, Mass.
Murray Co., The, Carver Div., E. Bridgewater, Mass.
National Fireworks, Inc., West Hanover, Mass.
Thurston Mfg. Co., Providence, R. I.
Waltham Watch Co., Waltham, Mass.
Wright Machine Co., Worcester, Mass.

Approved Forms 100 (new)

Hadley Special Tool Co., Boston, Mass.
Hemphill Co., Central Falls, R. I.
American Cam Co. of Massachusetts, Boston, Mass.

Revised Forms 100

American Optical Co., Southbridge, Mass.
Builders Iron Foundry, Providence, R. I.

Cancelled Forms 100

None.

New Apportionments

None.

Revised Apportionments

C-36a Elements, Optical, for Telescopes, M12, M12A1, M12A2.
C-31b Telescope, Panoramic, M12, M12A1, M12A2.

Cancelled Apportionments

None.

3. Educational Orders (continued)

W-ORD-411 (continued)

Appropriated		Disbursed
Mount Telescope M16	13,776.00	None
Mfg. Equipment	91,733.94	66,407.95
	105,509.94	66,407.95

W-ORD-395 Harrington & Richardson Arms Co.
Worcester, Massachusetts

Pistols, Automatic, Caliber .45

The status of procurement on this order is as follows: Item 2, 8%; Item 3, 4%; Item 4, 25%; and Item 5, 65%. Considerable additional progress was made on design of fixtures, tools, and gages for various components of the piece. A shop has been purchased by the concern for use as a tool room and office space for centralization of tool and gage designers working on the pistol. All equipment under Item 5 already procured is being removed to location of this shop so that work on this contract will be centrally located.

Appropriated		Disbursed
Pistols	13,645.00	None
Mfg. Equipment	183,257.35	54,322.63
	197,902.35	54,322.63

W-ORD-426 Waltham Watch Company
Waltham, Mass.

Mechanical Time Fuze M43A1

Approximately 36% of manufacturing aids have been procured on this order, and a number of the fuze parts produced. The set-up of the assembly line is about 50% finished, and the Westinghouse Regulator is being installed. All brass material for plates, etc., is on hand, and all steel stock should be received by March 15. Brass forgings for the lower cap have also been received at the plant, and aluminum alloy forgings for the fuze body are expected in the near future.

Appropriated		Disbursed
Fuzes	127,500.00	None
Mfg. Equipment	228,585.00	34,026.00
	356,085.00	34,026.00

3. Educational Orders (continued)

Production Studies (continued)

W 241 ORD-2 (continued)

and forwarded to Washington providing for price reduction to account for one gage which was to have been furnished under the original contract but which was found to be unnecessary.

Efforts to obtain increase in contract price, as requested by the contractor to compensate for unforeseen expenses to him, have been unsuccessful.

W 241 ORD-4 Fuze, P.D., M51 (Metal Parts)
Saco-Lowell Shops
Biddeford, Maine

Production Study has been completed and payment authorized.

W 241 ORD-5 Carriage, 155 mm. Gun, M1
Morgan Construction Co.
Worcester, Mass.

Work on this Study is progressing satisfactorily, and word has just been received to the effect that, while information has not been compiled in final form as yet, the basic data is available for use at any time.

Contractor has requested extension in time necessitated by change in plans brought about through decision to make weldments at the Morgan Construction Company plant rather than subcontract this work.

4. Miscellaneous

January 29, Mr. E. Bryant, CASF, and Mr. H. B. Hambleton, Gage Section, Office of Chief of Ordnance, visited the office to discuss with District personnel, civilian and military, present phases of gage facility expansion at the Taft-Peirce Manufacturing Company, Woonsocket, R. I. Following conference here in the office, they visited the Taft-Peirce plant.

Mr. H. H. Hampton from the Ammunition Division visited the District office January 31, in connection with shipment and storage of cartridge cases and artillery shells prior to convenience for receipt of same by loading plants now under construction.

February 3, the Executive Officer was guest speaker at luncheon of the Boston Executives Association, and covered the general topic of current aspects of Ordnance procurement and planning.

4. Miscellaneous (continued)

January 28 — Gun Machining Committee Meeting (Watervliet Arsenal)
F. J. Peterson, Government Inspector
Richard A. Gibson, Government Inspector
Mr. J. Farmer, Mr. Carl Cowdroy, Mr. Hunter — G. H. Cowdroy Machine Works

January 30 — Pyrotechnics Committee Meeting (Washington)
Captain F. A. Ritchie
R. E. Crowley, Government Inspector
H. H. Whitmore, National Fireworks, Inc.

February 11 — Rifled-Bore Shell Committee Meeting (Washington)
J. W. Bechtel, Government Inspector
M. G. Garfinkle, Boston Ordnance District Engineer
H. C. Dodge, President; K. Dunneody, Treasurer — S. A. Woods Machine Company

February 24 — Joint Artillery Fuze and Adapter Booster Committee Meeting (Picatinny Arsenal)
1st Lt. H. F. Schmidt
Mr. G. W. Polk, Production Manager, Independent Lock Company.

5. Current Procurement

(1) Contract Negotiation

Status of contracts awarded through District office negotiations is shown below, as given in weekly report on contracts as of February 24, 1941.

S. A. Woods Machine Co., Boston Mass.
Ord. 6839 - Procure 768,000 3" A.A. Shell, M42

Contract W 241 ORD-301 was approved by the Under Secretary of War on February 7, 1941 and received in this office on February 21, 1941. Contractor's copy was delivered to him on February 21, and final distribution of other copies has been made. First advance payment in in hands of Finance Officer.

Independent Lock Co., Fitchburg, Mass.
Ord. 6860 - Procure 1,000,000 Fuzes, P.D., M52

Contract W 241 ORD-302 was approved by the Under Secretary of War on February 1, 1941. Distribution of formal approved contracts has been completed.

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities.

John Bath & Co., Worcester, Mass.
Emergency Plant Facilities Contract W 241 ORD-307.
Negotiations completed, contract in hands of contractor for execution. Acquisition of the facilities is in process.

Jones & Lamson Machine Co., Springfield, Vermont.
Emergency Plant Facilities Contract W 241 ORD-319.
Letter of Intent issued January 28, 1941. Contractor has proceeded to enter into contract with the Morgan C. Tuttle Company for the construction of buildings required and is proceeding with the acquisition of the facilities required by the contract.

Bryant Chucking Grinder Co., Springfield, Vermont.
Emergency Plant Facilities Contract W 241 ORD-320.
Letter of Intent issued January 28, 1941. The contractor has entered into a contract for the construction of the buildings contemplated in the contract with Austin Company and is in the process of acquiring machinery items called for by the contract.

Reed-Prentice Corporation, Worcester, Mass.
Contract No. W 241 ORD-318.
Contract for the acquisition of 600 Toolroom Lathes which may be sold to Government agencies, their contractors, or subcontractors. The contractor has a lease agreement with the Defense Plant Corporation for the expansion of its manufacturing facilities. The contract form has been approved by the proper officers in the Office of the Chief of Ordnance and by counsel for the corporation and is in the process of execution.

Taft-Peirce Manufacturing Co., Woonsocket, R. I.
Emergency Plant Facilities Contract W 241 ORD-305.
Contract executed December 5, 1940. Contractor reports that all facilities to be acquired have been ordered and that a substantial portion of the facilities purchased have been installed.

In addition to procurement outlined above, the District is currently purchasing through supply contracts roughly $13,000 worth of Gage Laboratory Equipment.

(3) Current Inspection.

Arsenal or District	Contract P. O. or Req.	Facility Inspected	Item Inspected	No. of Inspections on Each Order	Estimated Date of Completion
Chief of Ordnance	#314-40-1570	Albert & J. M. Anderson Mfg. Co. Boston, Mass.	Case, Cartridge 3" A.A. Mk II (Ed. Order)	40	

5. Current Procurement (continued)

(5) Current Inspection (continued)

New requisitions for inspection received from Arsenals during the month - - - 20

New subrequisitions for inspection received from other Districts during the month - - - 64

Inspection requisitions completed during the month - - - - - - - - - - - - - - 45

Inspection requisitions in force - 257

Contracts under resident inspectors - 0

For the District Chief:

J. F. CRAWFORD
Lt. Colonel, Ordnance Dept., U.S.A.
Executive Officer

PES

RESTRICTED

WAR DEPARTMENT
Boston Ordnance District
Room 1501 - 140 Federal Street
Boston, Massachusetts

Mail + Record

B.O.D. No. 319.1/568

May 26, 1942

Subject: Monthly Report of Activities - May

To: Chief of Ordnance
Washington, D. C.

ATTN: Industrial Service, District Control Division

1. Personnel

1. Military Personnel

a. No. of officers on duty:

Regular Army	-	1
Army of the United States	-	3
Reserve Officers	-	45

b. No. of Reserve Officers authorized - 77

c. No. of Reserve Officers for whom active duty orders have been requested - 3

d. Reserve Officers who reported for active duty -

Major Ralph F. Gow, F.A. - Res., May 20, 1942.

1st Lt. Raymond L. Jennings, C.A. - Res. April 26, 1942.

1st Lt. Jackson Turner, AUS, May 15, 1942.

2nd Lt. George W. Brahmst, Engr. - Res. April 28, 1942.

2nd Lt. Robert H. Stettler, AUS, May 15, 1942.

2. Civilian Personnel

Civilian Personnel on duty as of May 25, 1942:

a. Accountants

CAF-7	4
CAF-10	1
CAF-11	1

Monthly Report, May

2. Civilian Personnel (continued)

b. Custodial

CU-1	30
CU-2	7
CU-3	3
CU-4	17
CU-5	4
CU-8	1
	62

c. Clerical and Administrative

CAF-1	286
CAF-2	85
CAF-3	23
CAF-4	38
CAF-5	34
CAF-6	6
CAF-7	14
CAF-8	7
CAF-9	3
CAF-10	1
CAF-14	1
CAF-15	3
	501

d. Inspectors

(1) Ordnance Material

CAF-1	171
CAF-2	128
CAF-3	86
CAF-4	62
CAF-5	74
CAF-6	19
CAF-7	8
CAF-8	1
	549

(2) Powder and Explosives

CAF-3	14
CAF-5	1
	15

564

2. Civilian Personnel (continued)

e. Sub Professional

SP-1	38	
SP-2	1	
SP-3	20	
SP-4	22	
SP-5	1	
SP-6	1	
SP-8	1	
		84

f. Professional

P-1	27	
P-2	20	
P-3	17	
P-4	21	
P-5	3	
		88

g. Plant Protection

CAF-7	1	
CAF-8	1	
CAF-9	3	
CAF-11	2	
CAF-12	1	
		8

TOTAL 1313

2. Surveys

a.	Number of new surveys	-	57
b.	Number of resurveys	-	84
c.	Number of plants visited for Procurement Planning purposes	-	993

3. Miscellaneous

During the period covered by current report, there were 5,390 visitors to the District Office.

There were 16,298 pieces of incoming and 28,419 pieces of outgoing mail during current report period.

3. Miscellaneous (continued)

May 16 - Brigadier General H. K. Rutherford from the Office of the Under Secretary of War in Washington visited with the Deputy District Chief.

April 26 - Five hundred persons attended the unfurling of a service flag at West End House, Boston, Massachusetts. The dedication speech was given by Lt. Jackson J. Holtz. The flag was unfurled by Mrs. James J. Storrow while the formalities were executed by Lt. Holtz.

May 18 - A luncheon in honor of the 20th anniversary of the Ordnance Procurement System was held at the Chamber of Commerce Building under the auspices of the Army Ordnance Association, Boston Post, and was attended by approximately 140 persons. Colonel Crawford spoke to the group and opened a round table discussion with those present. Other luncheons held in honor of this anniversary in this District were given in Providence, Rhode Island, Keane, New Hampshire, and at Springfield, Vermont.

May 18 - The radio addresses of General Somervell and General Wesson, given on the occasion of the Ordnance Procurement System anniversary, were heard by delayed transcription over station WNAC from 7:30 p.m. to 7:45 p.m. Following the broadcast of the transcription, Colonel Crawford made an address over the radio on the same station, and was assisted by Mr. Lewis Mustard, Treasurer of the Cummings Machine Works, Boston, Massachusetts. This broadcast portrayed contractor relationships and Ordnance production--procurement methods of the District.

May 23 - A luncheon was held, followed with a plant inspection by twelve officers of the Boston Ordnance District at the A. S. Campbell Company, Boston, Massachusetts. The occasion was the presentation to the Deputy District Chief of the millionth cartridge case produced by this company. Among the distinquished guests were Mr. Victor Raymond and Mr. John Campbell.

The following engineering committee meetings, arranged by the Chief of Ordnance, were held during the past month:

Committee:	Bar Stock Shell
Date:	May 1
Place:	Washington, D. C.
Office Representative:	A. G. Waite, Government Engineer

3. Miscellaneous (continued)

Committee:	Cartridge Case
Date:	May 5
Place:	Cleveland, Ohio
Office Representative:	Major L. E. Briggs
Committee:	Mobile Artillery Carriage
Date:	May 8
Place:	Washington, D. C.
Office Representatives:	Lt. J. C. Bogert and W. Murphy, Government Inspector
Committee:	Small Caliber A.P.
Date:	May 11
Place:	Rahway, New Jersey
Office Representatives:	Lt. E. E. Tuttle and A. G. Waite, Government Engineer
Committee:	Pyrotechnics
Date:	May 13
Place:	Washington, D. C.
Office Representative:	R. Miller, Government Engineer
Committee:	Large Caliber A.P.
Date:	May 18 and 19
Place:	Detroit, Michigan
Office Representatives:	Lt. E. E. Tuttle and A. G. Waite, Government Engineer
Committee:	Demolition Bomb Body
Date:	May 22
Place:	Washington, D. C.
Office Representative:	P. Perch, Government Engineer
Committee:	Tank
Date:	May 25
Place:	Detroit, Michigan
Office Representative:	H. J. Welch, Government Inspector
Committee:	Artillery Fuze
Date:	May 25
Place:	Chicago, Illinois
Office Representatives:	Capt. P. A. Nelles and R. W. Mojonnier Government Engineer
Committee:	Bomb Fuze
Date:	May 26
Place:	Chicago, Illinois
Office Representatives:	Capt. P. A. Nelles and R. W. Mojonnier Government Engineer

In addition a special tank armor plate committee meeting was held on May 20 at Detroit, Michigan. This meeting, attended by Lt. E. E. Tuttle was called by the Detroit Ordnance District.

4. Educational Orders

W-ORD-425 Waltham Watch Company
Waltham, Massachusetts

Fuze, Mechanical Time, M43A1

Our inspector reports that no substantial progress occurred on this order during the past month. Some 3800 completed fuzes are on hand. The second lot comprising 2500 fuzes is awaiting shipment pending results of ballistic tests on samples now at the Aberdeen Proving Ground. All static tests for the lot were conducted and the fuzes approved for the above shipment.

	Appropriated	Disbursed
Fuze	$127,284.40	$ 1,909.27
Mfg. Equipment	254,060.00	219,274.51
	$381,344.40	$221,183.78

W-ORD-411 Builders Iron Foundry
Providence, R. I.

Mount, Telescope M15A1

This order was completed prior to May 1, 1942 with the exception of slight changes to be made to two gages.

	Appropriated	Disbursed
Mount Telescope	$ 13,795.10	$ 13,795.10
Mfg. Equipment	91,424.19	77,071.69
	$105,219.29	$ 90,866.79

W-ORD-395 Harrington & Richardson Arms Company
Worcestor, Massachusetts

Pistol, Automatic, Caliber .45 M1911A1

All items accepted on this Educational Order contract were shipped to the Remington, Rand, Inc., Syracuse, New York for use by the latter on a prime contract for manufacture of .45 caliber pistols. The Blanchard Grinder procured on the contract is being leased to the Harrington & Richardson Arms Company for use on their prime order contract for Flare Pistols. An engineering survey and audit is being made on partially completed items to determine the reimbursement to the contractor for the same.

	Appropriated	Disbursed
Pistols	$ 15,545.00	$ 6,757.84
Mfg. Equipment	182,257.35	122,611.35
	$197,802.35	$129,369.19

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4. Educational Orders (continued)

W-ORD-363 C. H. Cowdrey Machine Works
Fitchburg, Massachusetts

75 mm. Pack Howitzer, M1A1

The contractor completed shipment of the 20 Pack Howitzers during the past month. Reports from the Proving Ground indicated that they were accepted. This completes all work on the above Educational Order, since no Production Analysis is to be submitted. Gages, jigs and fixtures, etc. procured on this order were shipped to the Draper Corporation, Hopedale, Massachusetts. They are to select those units suitable for use in their plant, have an immediate laboratory check made of the same and, if the units are satisfactory, incorporate them into their tooling setup. The remainder will be shipped back to Boston for storage in the district warehouse.

	Appropriated	Disbursed
Pack Howitzer	$ 66,540.00	$ 21,058.50
Mfg. Equipment	109,680.25	94,900.44
	$176,220.25	$115,958.94

5. Current Procurement

(1) Status of District Contracts

Regular Ordnance

Contract No. W 241 ORD-	Contractor's Name	Item	Status
1084	Bryant Chucking Grinder Co.	Machine Tools	Preparation
1082	Reed-Prentice Corporation	Machine Tools	Preparation
1079	Brown & Sharpe Mfg. Co.	Machine Tools	Preparation
1076	Abrasive Machine Co.	Machine Tools	To Contractor for signature
1075	Heald Machine Company	Machine Tools	Preparation
1074	Bryant Chucking Grinder Co.	Machine Tools	Preparation
1073	U.S. Automatic Box Machinery Company, Inc.	Machine Tools	To Contractor for signature
1072	Brown & Sharpe Mfg. Co.	Machine Tools	Preparation
1070	Union Twist Drill & Machine Co.	Machine Tools	To Contractor for signature
1068	Morse Twist Drill & Machine Co.	Machine Tools	Preparation
1065	L. S. Starrett Co.	Machine Tools	Preparation
1063	Federal Products Corp.	Machine Tools	To Contractor for signature
1062	Heald Machine Company	Machine Tools	To Contractor for signature
1061	Fitchburg Grinding Machine Corp,	Machine Tools	To Contractor for signature

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5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 241 ORD-	Contractor's Name	Item	Status
1060	Morse Twist Drill & Machine Co.	Machine Tools	To Contractor for signature
1059	Union Twist Drill & Machine Co.	Machine Tools	To Contractor for signature
1058	Reed-Prentice Corporation	Machine Tools	To Contractor for signature
1057	Potter & Johnston Machine Co.	Machine Tools	Preparation
1056	Norton Company	Machine Tools	To Contractor for signature
1055	Brown & Sharpe Mfg. Co.	Machine Tools	To Contractor for signature
980	B. C. Ames Co.	Machine Tools	To Contractor for signature
979	Cone Automatic Machine Co.	Machine Tools	Executed
977	Federal Products Corp.	Machine Tools	To Contractor for signature
978	Bay State Stamping Co.	Machine Tools	Preparation
976	Heald Machine Co.	Machine Tools	Preparation
975	Norton Company	Machine Tools	Preparation
974	L. S. Starrett Co.	Machine Tools	To Contractor for signature
973	Heald Machine Co.	Machine Tools	Preparation
972	Waltham Dial Gage Co.	Machine Tools	To Contractor for signature
971	Fay & Scott	Machine Tools	Distributed
970	Brown & Sharpe Mfg. Co.	Machine Tools	To Contractor for signature
969	Reed-Prentice Corporation	Machine Tools	To Contractor for signature
968	Fellows Gear Shaper Co.	Machine Tools	Executed
967	Jones & Lamson Machine Co.	Machine Tools	Preparation
966	Union Twist Drill & Machine Co.	Machine Tools	To Contractor for signature
965	Heald Machine Co.	Machine Tools	To Contractor for signature
964	Brown & Sharpe Mfg. Co.	Machine Tools	Preparation
963	Fellows Gear Shaper Co.	Machine Tools	Distributed
962	Liberty Tool & Gage Co.	Machine Tools	Executed
961	Winter Brothers Co.	Machine Tools	Executed
960	Rivett Lathe & Grinder Co.	Machine Tools	Executed
959	Norton Company	Machine Tools	To Contractor for signature

5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 241 ORD-	Contractor's Name	Item	Status
958	Heald Machine Co.	Machine Tools	To Contractor for signature
957	Abrasive Machine Co.	Machine Tools	To Contractor for signature
956	Morse Twist Drill & Machine Co.	Machine Tools	To Contractor for signature
955	L. S. Starrett Co.	Machine Tools	Distributed
954	Potter & Johnston Machine Co.	Machine Tools	Distributed
953	Mossberg Pressed Steel Co.	Machine Tools	Distributed
952	Fellows Gear Shaper Co.	Machine Tools	Executed
951	Henry L. Hanson Co.	Machine Tools	Distributed
928	A. S. Campbell Co.	Case, Cartridge 20 mm. M21 (steel)	Preparation
927	Beckwith Mfg. Co.	Scabbards, Bayonet, M3	To Contractor for signature
926	Murmac Manufacturing Co.	Spare Parts for Light Tank M3	To Contractor for signature
917	Waterhouse Company	Bags, Base Plate, M4 for 60 mm. Mounts	To Contractor for signature
916	Cambridge Screw Corp.	Primer Percussion, M23A2	To Contractor for signature
801	Wade Tool Company	Machine Tools	Preparation
796	L. S. Starrett Co.	Machine Tools	Preparation
795	Norton Company	Machine Tools	Preparation
794	Norton Company	Machine Tools	Preparation
793	Bryant Chucking Grinder Co.	Machine Tools	Preparation
777	Norton Company	Gage Expansion	Preparation
775	Brown & Sharpe Mfg. Co.	Gage Expansion	To Contractor for signature
751	United Shoe Machinery Corp.	Confidential	To Contractor for signature
742	Blanchard Machine Co.	Machine Tools	Distributed
741	Leland-Gifford Company	Machine Tools	Executed
740	Reed-Prentice Corp.	Machine Tools	Executed
739	Heald Machine Company	Machine Tools	To Contractor for signature
738	Taft-Peirce Mfg. Company	Machine Tools	Executed
737	Abrasive Machine Tool Co.	Machine Tools	Distributed
736	Lapointe Machine Tool Co.	Machine Tools	Distributed
735	Edward Blake Company	Machine Tools	Distributed

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5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 241 ORD-	Contractor's Name	Item	Status
734	Henry L. Hanson Company	Machine Tools	Distributed
733	Blanchard Machine Co.	Machine Tools	Distributed
732	Winter Brothers	Machine Tools	Preparation
731	Avion Machine & Tool Co.	Machine Tools	Distributed
730	S. W. Card Mfg. Co.	Machine Tools	Preparation
729	L. F. Fales Machine Co.	Machine Tools	Distributed
728	Winona Tool Mfg. Co.	Machine Tools	Distributed
727	Winter Brothers Co.	Machine Tools	Distributed
726	Scott & Williams	Machine Tools	To Contractor for signature
725	Norton Company	Machine Tools	Distributed
724	Norton Company	Machine Tools	Executed
723	Jones & Lamson Machine Company	Machine Tools	To Contractor for signature
722	American Electric Furnace Company	Machine Tools	Distributed
721	Cone Automatic Mach. Co.	Machine Tools	Distributed
720	Brown & Sharpe Mfg. Co.	Machine Tools	Executed
719	Bryant Chucking Grinder Company	Machine Tools	Preparation
718	E. N. Cook Plate Co.	Machine Tools	To Contractor for signature
716	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
715	Henry L. Hanson Co.	Machine Tools	Distributed
714	Turner Tanning Mach. Co.	Machine Tools	Distributed
713	Liberty Tool & Gage Co.	Machine Tools	Distributed
712	Heald Machine Co.	Machine Tools	To Contractor for signature
699	D. M. Watkins Co.	Primer, Percussion, M28A2	To Contractor for signature
698	Wm. E. Wright & Sons Co.	Parachute for Flare, Aircraft, M26	Executed
697	United Shoe Machinery Corp.	Extra Parts for 37 mm. Guns, M3	Executed
696	Sparling Bros. Mach. Co.	Repair Tools for Light Tank, M3	Distributed
695	Avion Mach. & Tool Co.	Perishable Tools	Preparation
694	Keyes Fibre Co.	Mines, Anti-Tank Non-Metallic	To Contractor for signature
693	Keystone Mfg. Co.	Shell, H.E., 37 mm. M63	Preparation
692	American Wringer Co.	Shot, A.P., 57 mm., M70	Preparation

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5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 241 ORD-	Contractor's Name	Item	Status
691	E. N. Cook Plate Co.	Perishable Tools	Preparation
690	E. N. Cook Plate Co.	Perishable Tools	Preparation
689	F. & M. Co.	Perishable Tools	Preparation
688	Ideal Tooth, Inc.	Perishable Tools	Preparation
687	Longwood Engineering Co.	Perishable Tools	Preparation
686	Trifari, Krussman & Fishel	Perishable Tools	Preparation
685	Transit Machine Co.	Perishable Tools	Preparation
684	Associated Attleboro Manufacturers	Perishable Tools	Preparation
683	B. R. Johnson Co.	Perishable Tools	Preparation
682	Albert J. Germain Co.	Perishable Tools	Preparation
681	Continental Screw Co.	Perishable Tools	Preparation
680	Varney Machine Co.	Perishable Tools	Preparation
679	Duplicate Parts Co.Inc.	Perishable Tools	Preparation
678	Sarl Instrument Co.	Perishable Tools	Preparation
677	The Gaychrome Co.	Perishable Tools	Preparation
676	Carl-Art Company	Perishable Tools	Preparation
675	Imperial Knife Co.Inc.	Perishable Tools	Preparation
674	Stevens-Walden, Inc.	Perishable Tools	Preparation
673	Mead-Morrison Service, Inc.	Perishable Tools	Preparation
672	Trifari, Krussman & Fishel	Perishable Tools	Preparation
670	Automatic Machine Prod.	Primer, Percussion,M38	Distributed
669	Hersey Mfg. Co.	Primer, Percussion,M38	To Contractor for signature
668	H. & B. American Machine Company	Shot, A.P.,90 mm.,M77	To Contractor for signature
667	Wright Machine Co.	Booster, M22	Distributed
665	Wright Machine Co.	Fuze, P.D., M57	Distributed
664	Crompton & Knowles Loom Works	Tracer and Igniter for Shell, Mk. I/L	Preparation
663	Brown & Sharpe Mfg. Co.	Gage Expansion	Preparation
660	Norton Company	Gage Expansion	Executed
659	Austin-Hastings	Gage Expansion	Executed
658	Heald Machine Co.	Gage Expansion	To Contractor for signature
657	Leland-Gifford	Gage Expansion	Distributed
656	Charles G. Allen Co.	Gage Expansion	To Contractor for signature

5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 241 ORD-	Contractor's Name	Item	Status
655	Austin-Hastings Co., Inc.	Gage Expansion	Distributed
654	R. S. Wilder, Inc.	Gage Expansion	Distributed
650	Worcester Taper Pin Co.	Tracer and Igniter for Shell, Mk. I/L	Distributed
649	Waltham Watch Co.	Fuze, B.D., M58	Distributed
648	Worcester Stamped Metal Company	Fuze, Seat Liner	Executed
647	Warren Telechron Co.	Primer, Percussion, M23A2	Executed
646	Gorham Mfg. Co.	Case, Cartridge, 37 mm. M16B1 - Steel	Preparation
645	Hersey Mfg. Co.	Primer, Percussion, M38, M38 - Mod.	Distributed
644	Narragansett Mach. Co.	Machinery to increase production	Distributed
643	Gillette Safety Razor Co.	Primer, Percussion, M23A2	To Contractor for signature
642	Wright Machine Co.	Booster, M22, Metal Parts	Distributed
641	Gillette Safety Razor Co.	Fuze, Percussion, DA. No. 253, Mk. I/A/	Distributed
640	Warren Telechron Co.	Primer, Percussion, M23A1	Distributed
639	Cambridge Screw Co.	Sharpeners	Distributed
638	Cohn & Rosenberger, Inc.	Primer, Percussion, M23A1	Distributed
637	S. A. Woods Mach. Co.	Shell, H.E.,3", M42A1 - Complete	Distributed
636	Norton Company	Carborundum,#150 Grain	Distributed
633	Peacedale Braiding Co.	Cordage,Rayon,High Strength,Braided,Type A	Distributed
632	Persons-Majestic Mfg.Co.	Shell, H.E.,20 mm.,Mk I	Distributed
631	Freeman-Daughaday Co.	Fuze,Percussion,D.A. No. 253 Mk. I/A/	Distributed
630	Pantex Pressing Machine, Inc.	Shot, A.P.,20 mm.,M75	Distributed
629	Welsh Mfg. Co.	Eyeglasses, Amber, M2	Distributed
628	Ginsburg Brothers	Paper Towels	Preparation
627	Worcester Stamped Metal Company	Research Contract	Executed
626	New England Small Arms Co.	Browning Automatic Rifles	To Contractor for signature

5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 241 ORD-	Contractor's Name	Item	Status
625	Blanchard Mach. Co.	Gage Expansion	To Contractor for signature
624	George C. Moore Co.	Belts, Ammunition, Cal. 30, M1917	Distributed
623	Independent Lock Co.	Fuze, P.D., M52B1	Distributed
622	D. M. Watkins Co.	Primer, Percussion, M28A2	Distributed
621	Hersey Mfg. Co.	Primer, Percussion, M28A2	To Contractor for signature
620	Wright Machine Co.	Booster, M20A1/Metal Parts/	Distributed
619	U.S. Rubber Co.	Machinery to Increase Production	To Contractor for signature
618	United Shoe Mach. Corporation	Confidential	Distributed
617	Taft-Peirce Co.	Gage Expansion	Distributed
616	Olson Mfg. Co.	Primer, Percussion, M33/ Metal Parts/	Distributed
615	Providence Eng. Co.	Gage Expansion	Distributed
614	Van Keuren Co.	Gage Expansion	Distributed
613	P. F. Hesse Narrow Fabric Co.	Ammunition, Cal.30, M1917	Preparation
612	Samson Cordage Works	Ammunition Cal. 30.M1917	Preparation
610	F. W. Judge Optical Works	Porro Prisms for Binoculars, M3	Distributed
609	T. W. Foster & Bros. Co., Inc.	Primer, Percussion M31A2	Distributed
608	H. E. Wright Co.	Canister, M2, 37 mm.	Distributed
607	Artcraft Metal Products Co.	Canister, 37 mm., M2	Distributed
606	Bird & Son, Inc.	Shell, G.F., H.E., 40 mm., Mk II T/L/	Distributed
604	Jones & Lamson Machine Co.	Machine Tools	Distributed
603	Brown & Sharpe Manufacturing Co.	Machine Tools	Distributed
602	Fitchburg Grinding Machine Co.	Machine Tools	Distributed
601	Morse Twist Drill & Machine Co.	Machine Tools	Distributed
600	Nicholson File Co.	Machine Tools	Distributed
599	Winter Bros. Co.	Machine Tools	Distributed
598	Heald Machine Co.	Machine Tools	To Contractor for signature

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5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. 241 ORD-	Contractor's Name	Item	Status
597	Calvin Dean, Inc.	Machine Tools	To Contractor for signature
596	Duplicate Parts Co., Inc.	Machine Tools	Distributed
593	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
591	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
590	Norton Company	Machine Tools	Distributed
589	Rivett Lathe & Grinder Co.	Machine Tools	Distributed
588	Fellows Gear Shaper Co.	Machine Tools	Distributed
587	Morse Twist Drill & Mach. Co.	Machine Tools	Distributed
586	Bryant Chucking Grinder Co.	Machine Tools	Distributed
585	Fellows Gear Shaper Co.	Machine Tools	Distributed
584	Winter Brothers	Machine Tools	Distributed
582	Edward Blake Co.	Machine Tools	Distributed
581	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
579	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
571	Heald Machine Co.	Machine Tools	Distributed
565	B. C. Ames Co.	Machine Tools	Distributed
560	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
558	Fellows Gear Shaper Co.	Machine Tools	Distributed
556	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
555	Blanchard Machine Co.	Machine Tools	Distributed
553	S. W. Card Mfg. Co.	Machine Tools	Distributed
549	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
547	O. S. Walker Co.	Machine Tools	Distributed
543	Jones & Lamson Machine Co.	Machine Tools	Distributed
541	United Shoe Machinery Corp.	Confidential	To Contractor for signature
540	Arter Grinding Machine Co.	Gage Expansion	Distributed
538	Automatic Mach. Products	Primer Percussion, M1B1A2	Distributed
537	T. W. Foster & Bros. Co.,Inc.	Primer Percussion, M22A3	Distributed
536	George Knight & Co.	Primer Percussion, M22A3	Distributed
535	Jones & Lamson Machine Co.	Gage Expansion	Executed
534	Charles G. Allen Co.	Gage Expansion	Distributed
532	National Fireworks, Inc.	Light Signal Very, Mk II, Red Star	Distributed
531	Westover Fabrics, Inc.	High Tenacity Rayon Cloth for Parachutes	Distributed
530	Greenville Mills	High Tenacity Rayon Cloth for Parachutes	Distributed

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5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Regular Ordnance (continued)

Contract No. W 741 ORD-	Contractor's Name	Item	Status
529	Federal Products	Plain Bearing C-2-1 Univ. Test Indicator	Distributed
528	S.A.Woods Mach.Co.	Shells H.E., 75 mm., M48, Complete	Distributed
526	International Braid Co.	Belts,Ammunition,Cal.30,M1917	Preparation
523	Cohn & Rosenberger, Inc.	Tracer,Igniter,Shell, Mk I/L/	Distributed
521	S.A.Woods Mach.Co.	Shell,H.E.,A.T., 75 mm., M66	Executed
518	Thos. French & Sons, Ltd.	Belts, Ammunition,Cal.30,M1917	To Contractor for signature
517	N.E.Spun Silk Corp.	Twine, Tieing, Twisted Silk	Distributed
516	N.E.Spun Silk Corp.	Twine, Balbon Silk	Distributed
510	Cummings Mach. Co.	Case	Distributed
505	H.&B. American Machine Co.	Shot, S.A.P.,M72, 75 mm.	Distributed
495	Parker & Harper Mfg. Co.	Shell, H.E., 20 mm., Mk I	Distributed
488	Draper Corp.	Shot, S.A.P., 37 mm., M74	To Contractor for signature
487	Stevens-Walden, Inc.	Shot, S.A.P., 37 mm., M74	Distributed
485	F.L. & J.C. Codman Company	Parachute, Assembly for Bomb	Distributed
484	Shawmut Woolen Mills	Parachute, Assembly for Bomb	Distributed
471	Norton Company	Gage Expansion	Distributed
459	Keystone Mfg. Co.	Fuze, Bomb, Nose, M103, Facilities	Distributed
449	United Shoe Mach. Corp.	37 mm. Guns	Executed
448	United Shoe Mach. Corp.	37 mm. Guns	Distributed
446	Brown & Sharpe Mfg. Co.	Gage Expansion	Distributed
442	Brown Bag Filling Machine Co.	Construction of Bandoleer Filling Machine	Executed
441	Heald Machine Co.	Gage Expansion	Distributed
420	Harrington & Richardson	Pistols, Very, 10 Gage	To Contractor for signature
407	A.S.Campbell Co.	Case,Cartridge, 20 mm., M21	Distributed
379	Whitin Mach.Works	Projectile, Ball., 20 mm., Metal Parts	Distributed

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5. Current Procurement (continued)

(1) Status of District Contracts (continued)

Defense Aid

Contract No. DAW 241 ORD-	Contractor's Name	Item	Status
677	Warren Telechron Co.	Primer,Percussion, M23A2	Executed
676	Keystone Mfg. Co.	Shell,H.E.37 mm., M63	Preparation
674	Gorham Mfg. Co.	Case,Cartridge,37 mm. M16B1	Preparation
672	National Fireworks, Inc.	Loading of C/R Shell, H.E. Mk I	To Contractor for signature
669	Reed-Prentice Corp.	Machine Tools	Preparation
668	Norton Company	Machine Tools	Preparation
667	Reed-Prentice Corp.	Machine Tools	To Contractor for signature
665	Heald Machine Co.	Machine Tools	To Contractor for signature
664	Lapointe Machine Tool Co.	Machine Tools	Executed
663	Brown & Sharpe Mfg. Company	Machine Tools	Distributed
662	Cone Automatic Machine Co.	Machine Tools	Executed
661	Norton Company	Machine Tools	Executed
660	Heald Machine Co.	Machine Tools	To Contractor for signature
658	Morse Twist Drill & Machine Co.	Machine Tools	To Contractor for signature
656	Reed-Prentice Corp.	Machine Tools	Distributed
655	Norton Company	Machine Tools	Distributed
654	Reed-Prentice Corp.	Machine Tools	Distributed
653	Builders Iron Foundry	Machine Tools	Distributed
652	Brown & Sharpe Mfg. Company	Machine Tools	Distributed
650	Brown & Sharpe Mfg. Company	Machine Tools	Distributed
649	Norton Company	Machine Tools	To Contractor for signature
648	Norton Company	Machine Tools	Distributed
645	Rivett Lathe & Grinder Co.	Machine Tools	Distributed
643	Norton Company	Machine Tools	Distributed
642	Crompton-Knowles Loom Works	Shell,H.E., 20 mm., Mk I Hispano Gun /A/	Distributed
641	Waltham Watch Co.	Fuze,Percussion, D.A. #253, Mk I/A/	Distributed
640	Brown & Sharpe Mfg. Company	Machine Tools	Distributed

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5. Current Procurement (continued)

Status of District Contracts (continued)

Defense Aid (continued)

Contract No. WAW 241 ORD-	Contractor's Name	Item	Status
638	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
637	Blanchard Machine Co.	Machine Tools	Distributed
635	Reed-Prentice Corp.	Machine Tools	Distributed
634	Union Twist Drill & Machine Co.	Machine Tools	Distributed
632	Norton Company	Machine Tools	Distributed
630	Morse Twist Drill & Machine Co.	Machine Tools	Distributed
629	Cone Automatic Mach. Co.	Machine Tools	Preparation
626	Heald Machine Co.	Machine Tools	Distributed
624	Bryant Chucking Grinder Company	Machine Tools	Distributed
622	Jones & Lamson Mach. Co.	Machine Tools	Distributed
621	Morse Twist Drill & Mach. Company	Machine Tools	Distributed
620	Morse Twist Drill & Mach. Company	Machine Tools	Distributed
619	Jones & Lamson Mach. Co.	Machine Tools	Distributed
618	Jones & Lamson Mach. Co.	Machine Tools	To Contractor for signature
616	Jones & Lamson Mach. Co.	Machine Tools	Distributed
607	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
606	Morse Twist Drill & Mach. Company	Machine Tools	Distributed
605	Reed-Prentice Corp.	Machine Tools	Distributed
599	Norton Company	Machine Tools	Distributed
598	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
596	Union Twist Drill & Mach. Company	Machine Tools	Distributed
588	Jones & Lamson Mach. Co.	Machine Tools	Distributed
587	Heald Machine Co.	Machine Tools	Distributed
584	Lapointe Mach.Tool Co.	Machine Tools	Distributed
583	Union Twist Drill & Mach. Company	Machine Tools	Distributed
580	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
574	Brown & Sharpe Mfg. Co.	Machine Tools	Distributed
564	Jones & Lamson Mach. Co.	Machine Tools	Distributed
563	Norton Company	Machine Tools	Distributed
562	Jones & Lamson Mach. Co.	Machine Tools	Distributed
561	Jones & Lamson Mach. Co.	Machine Tools	Distributed
544	Union Twist Drill & Mach. Company	Machine Tools	Distributed
515	Reed-Prentice Corp.	Machine Tools	Distributed

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5. Current Procurement (continued)
Status of District Contracts (continued)
Defense Aid (continued)

Contract No. DAW 241 ORD-	Contractor's Name	Item	Status
513	Reed-Prentice Corp.	Machine Tools	Distributed
477	Jones & Lamson Machine Co.	Machine Tools	Distributed
469	Jones & Lamson Machine Co.	Machine Tools	Distributed
448	King Tap & Tool Co.	Machine Tools	Distributed
446	Morse Twist Drill & Machine Co.	Machine Tools	Distributed
392	Jones & Lamson Machine Co.	Machine Tools	Distributed
358	Jones & Lamson Machine Co.	Machine Tools	Distributed
301	Morse Twist Drill & Machine Company	Machine Tools	Distributed
254	Lapointe Machine Co.	Machine Tools	Distributed
246	Lapointe Machine Co.	Machine Tools	Distributed
128	Morse Twist Drill & Machine Co.	Machine Tools	Distributed

(2) Miscellaneous Current Procurement Activities

AMMUNITION DIVISION

A. New Negotiations During Period Covered by this Report

(1) Specific Allocations to Boston Ordnance District

Quantity	Item
300#	Carborundum, 150 Grain (Code 5004) or similar
12,500,000 yds.	Cloth, Rayon, High Strength for Flare Parachutes
140,000	Bomb, Chemical, 100#, M47A1

(2) Specific Allocations to Boston Ordnance District for Continuity of Production

Quantity	Item
1,520,640	Tracer & Igniter, Shell, #12, Mk.I/L, Internal, (40 mm.)

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5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

(3) Specific Allocations to Boston Ordnance District Facilities

Quantity	Item	Facility
250,000 yds-"C" 100,000 yds-"B"	Cartridge Cloth, Igniter, Silk "C" & "B"	Rhode Island Fabrics Co. Pawtucket, Rhode Island
153,750 yds	Band, Copper, Driving for 7.2" B/L, S/L, Shell	Revere Copper & Brass, Inc. New Bedford, Mass.
1,245,668 - M37 311,417 - M39	Signal, Aircraft, M37 & M39	National Fireworks, Inc. West Hanover, Mass.
605,164	Shot, A.P., 20 mm. M75 (Contract conversion)	Whitin Machine Works Whitinsville, Mass.
24,490	Parachute, Flare, Aircraft M26 (Continuation)	Wm. E. Wright & Sons, Co. West Warren, Mass.
341,695	Primer, Percussion, M1B1A2 (Continuation)	Automatic Machine Products Co., Attleboro, Mass.

(4) Specific Allocations to Boston Ordnance District Facilities for Experimental Orders

Quantity	Item	Facility
25	Mine, Anti-Tank, Non-Metallic	Keyes Fibre Company Waterville, Maine

(5) Proposals in Connection with Contracts Awarded or to be Awarded by the Boston Ordnance District Award Board

Quantity	Item	Facility
750,000 416,000	Shell, H. E., 37 mm., M63	Keystone Manufacturing Co. Boston, Massachusetts
530,000	Primer, Percussion, M23A2	Warren Telechron Company Ashland, Massachusetts

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5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Quantity	Item	Facility
900,000	Primer, Percussion, M23A2	Gillette Safety Razor Co. South Boston, Mass.
760,000	Primer, Percussion, M23A2	Cambridge Screw Company Cambridge, Massachusetts
24,490	Parachute, Flare, Aircraft M26	Wm. E. Wright & Sons Co. West Warren, Mass.
25	Mine, Anti-tank, Non-metallic	Keyes Fibre Company Waterville, Maine
350,000 yds.	Cartridge Cloth, Igniter, Silk "B" & "C"	Rhode Island Fabrics Co. Pawtucket, Rhode Island
360,000	Shot, A.P., 37 mm, M74 (Renegotiation)	Whitin Machine Works Whitinsville, Mass.
341,695	Primer, Percussion, M1B1A2	Automatic Machine Products Company, Attleboro, Massachusetts
20,000	Case, Cartridge, 37 mm., M16B1 (Steel) (Experimental)	Gorham Manufacturing Co. Providence, Rhode Island
20,000	Case, Cartridge, 40 mm., M 25B1 (Steel) (Experimental)	Worcester Stamped Metal Co. Worcester, Massachusetts
20,000	Case, Cartridge, 20 mm., M2LalB1 (Steel) (Experimental)	A. S. Campbell Company, East Boston, Massachusetts
1,131,375	Fuze, P.D. M56 (Contract Transfer)	Warren Telochron Company Ashland, Massachusetts

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

(6) Proposals in Connection with Contracts Awarded or to be Awarded by the Boston Ordnance District Award Board

Quantity	Item	Facility
1,000,000	Primer Detonator, M14	Waltham Watch Company Waltham, Massachusetts
400,000	Primer Detonator, M14	New England Screw Company Keene, New Hampshire
800,000 400,000	Primer Detonator, M14	Independent Lock Company Fitchburg, Massachusetts
400,000	Primer Detonator, M14	Watts Regulator Company Lawrence, Massachusetts
400,000	Primer Detonator, M14	Stator Corporation Providence, Rhode Island
2,000,000	Primer Detonator, M14	Uncas Manufacturing Company Providence, Rhode Island
400,000	Primer Detonator, M14	Heywood-Wakefield Company Gardner, Massachusetts
120,000	Primer Detonator, M14	Whitin Machine Works Whitinsville, Massachusetts
4,000,000	Fuze, P.D., M64A1	Warren Telechron Company Ashland, Massachusetts
8,000,000 4,000,000	Fuze, P.D., M64A1	Morse, Lockhart & Morse, Inc. Stoughton, Massachusetts

TOTAL NUMBER OF INVITATIONS TO NEGOTIATE -- 186
TOTAL NUMBER OF AWARDS MADE ---------- 11

Monthly Report, May

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

ARTILLERY DIVISION

A. New Negotiations During Period Covered by This Report

Quantity	Item
52	Equipment, Light Tank, M3, Wrenches
6,485	Fuze Setter, M14
89	Equipment, Light Tank, M3, Pullers
7,539	Equipment, Light Tank, M3, Pullers
10	Varieties Assorted Tank Tools for Light Tank, M3
463	Equipment, Light Tank, M3, Pullers
25,470	Carrying Case, M14
907	Indicator, Powder Temperature, M1
1,000	Gun, 75 mm., M3
40	Mount, Telescope, M28
40	Mount, Telescope, M29
Variable	Shaft and Casing, Tachometer (Light Tank, M3)
1,322	Equipment, Light Tank, M3, Wrenches
2,086	Equipment, Light Tank, M3, Wrenches

B. Proposals Submitted to Washington During Period Covered by This Report

Quantity	Item	Facility
100/mo.	Recoil Mechanism, M12	Bird Machine Company
40	Mount, Telescope, M28	Cummings Machine Works

TOTAL NUMBER OF INVITATIONS TO NEGOTIATE -- 14
TOTAL NUMBER OF AWARDS MADE -- 7

GAGE EXPANSION DIVISION

A. New Negotiations During Period Covered by This Report

Quantity	Item
2	Allen Toolroom Drill Presses, assigned to Lacey Manufacturing Company, Bridgeport, Connecticut
1	Allen HMD Drilling Machine, assigned to Progressive Tool & Die Company, Worcester, Massachusetts
1	Blanchard #18 Vertical Surface Grinder assigned to Conmar Products Company, Newark, New Jersey
1	#2 J-B Tap Grinder, assigned to Sossner Tool & Machine Works, Lynbrook, New York
1	10" B&S Rotary Attachment, assigned to W. C. Norris Manufacturing Company, Tulsa, Oklahoma

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Quantity	Item
5	Brown & Sharpe #1 Universal Grinders
Extra Attachments	For B&S #2 Miller & #2B Surface Grinder, assigned to General Metal Products Company, St. Louis, Missouri
10	B&S #510 Permanent Magnetic Chucks
4	B&S #510 Permanent Magnetic Chucks
1	B&S #618 Permanent Magnetic Chucks
Extra Attachments	For B&S #2B Surface Grinder & #2 B&S Light Universal Miller, assigned to Omar Tool & Machine Company, St. Louis, Missouri
4	B&S #510 Permanent Magnetic Chucks
Extra Attachments	For B&S #2 Light Universal Miller, assigned to Boston Machine Company, Lynn, Massachusetts
Extra Attachments	For B&S #2B Surface Grinder, assigned to Toolcraft Corporation, Chicago, Illinois
1	B&S #3 Universal Grinder, assigned to Peerless Tool & Engineering Company, Chicago, Illinois
3	B&S #618 Permanent Magnetic Chucks
2	B&S #510 Permanent Magnetic Chucks
2	B&S 10" Universal Index Centers (Assigned to Peerless
2	B&S 7" 3 jaw chucks (Tool & Engineering (Co., Chicago, Ill.
Extra Attachments	For B&S #13 Grinder, assigned to Electrix Corporation, Pawtucket, Rhode Island
Extra Attachments	For B&S #1 and B&S #2 Grinders assigned to Peerless Tool & Engineering Company, Chicago, Illinois
3	Federal N.B. 60 Comparators (Assigned to Peerless
6	Federal 11OB 3 Comparators (Tool & Engineering Co., (Chicago, Illinois
5	Heald 72A5 Internal Grinders
1	Heald 72A5 Internal Grinder assigned to Progressive Tool & Die Company, Worcester, Massachusetts
1	Heald 72A5 Internal Grinder assigned to Peerless Tool & Engineering Company, Chicago, Illinois
1	Jones & Lamson Thread Grinder assigned to Ehrhardt Tool & Machine Company, St. Louis, Missouri
1	Jones & Lamson Comparator assigned to Industrial Tool & Die Company, St. Paul, Minnesota
1	Jones & Lamson Comparator assigned to General Metal Products Company, St. Louis, Missouri
Extra Attachments	For Jones & Lamson Thread Grinder assigned to Ehrhardt Tool & Machine Company, St. Louis, Missouri
2	Jones & Lamson Thread Grinders assigned to Conmar Products Corporation, Newark, New Jersey
1	Jones & Lamson Comparator assigned to Omar Tool Company, St. Louis, Missouri
1	Jones & Lamson Comparator assigned to F. H. Robertson Company, Malden, Massachusetts

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5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Quantity	Item
1	Jones & Lamson Comparator assigned to Peerless Tool & Engineering Company, Chicago, Illinois
1	Leland-Gifford #2 Drilling Machine assigned to Conmar Products Corporation, Newark, New Jersey
1	4 jaw 5" Index Chuck for Norton #2 Universal Cutter & Tool Grinder assigned to W. C. Norris Manufacturing Company, Tulsa, Oklahoma
12	Norton #2 Universal Cutter & Tool Grinders
2	B&S #1236 Permanent Magnetic Chucks
1	Coolant System for Norton #2 Cutter Grinder assigned to Otis Engineering Company, Dallas, Texas
Extra Attachments	For Norton #2 Cutter Grinder assigned to Omar Tool & Machine Company, St. Louis, Missouri
1	Norton #10 U Lapping Machine assigned to Progressive Tool & Die Company, Worcester, Massachusetts
1	B&S #1236 Permanent Magnetic Chuck
1	Norton #10 U Lapping Machine assigned to Peerless Tool & Engineering Company, Chicago, Illinois
1	B&S #1236 Permanent Magnetic Chuck
1	Reed Prentice Lathe for Peerless Tool & Engineering Company, Chicago, Illinois
Extra Attachments	For Rivett #918 Lathe assigned to Otis Engineering Company, Dallas, Texas
1	4 jaw 4" chuck for Rivett #104 Grinder assigned to W. C. Norris Manufacturing Company, Tulsa, Oklahoma
Extra Attachments	For Rivett #918 Lathe assigned to General Metal Products Company, St. Louis, Missouri
Extra Attachments	For Rivett #918 Lathe assigned to Hittle Machine Company, Indianapolis, Indiana
Extra Attachments	For Rivett #104 Grinder assigned to Omar Machine & Tool Company, St. Louis, Missouri
Extra Attachments	For Rivett #918 Lathe assigned to Boston Machine Works, Lynn, Massachusetts
Extra Attachments	For Rivett #104 Grinder assigned to Electrix Corporation, Pawtucket, Rhode Island
1	#3 - "Y" Sentry Electric Hardening Furnace assigned to Sossner Tool Machine Works, Lynbrood, New York
15	Starret #711 F Indicators
10	Taft-Peirce #9115 Sine Bars
5	Taft-Peirce #9118 Sine Blocks.
1	14" x 14" Lapping Plate assigned to Frankford Arsenal Philadelphia, Pennsylvania
1	Angle Block & Sine Bar sets for Taft-Peirce #1 Grinders assigned to Omar Tool & Machine Company, St. Louis, Missouri
2	Taft-Peirce #9205 Bench Centers assigned to Peerless Tool & Engineering Company, Chicago, Illinois

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Quantity	Item
6	Angle Block & Sine Bar Set for Taft-Peirce #1 Grinder assigned to Electrix Corporation, Pawtucket, R. I.
6	Rectifiers assigned to Electrix Corporation, Pawtucket, Rhode Island
5	Wilder Micro Projectors
4	Wilder Micro Projectors

B. Proposals Submitted to Washington During Period Covered by This Report

Quantity	Item	Facility
16	Switches for Motors	H. Leach Machinery Company Providence, Rhode Island
2	#10U Lapping Machine	Norton Company Worcester, Massachusetts
2	High Speed Extension Spindles	H. Leach Machinery Company Providence, Rhode Island
5	Sine Bars	Taft-Peirce Manufacturing Company
5	Sine Blocks	Woonsocket, Rhode Island
1	Vertical Mill & Jig Borer	Austin-Hastings Company Cambridge, Massachusetts
5	Micro Projector	R. S. Wilder Company Waltham, Massachusetts
1	#25A Rotary Surface Grinder	Heald Machine Company Worcester, Massachusetts
1	72A5 Internal Grinder	Heald Machine Company Worcester, Massachusetts
1	#18 Vertical Surface Grinder	Blanchard Machine Company Worcester, Massachusetts
5	#1 Universal Grinder	Brown & Sharpe Manufacturing Co. Providence, Rhode Island
12	#2 Universal Tool & Cutter Grinder	Norton Company Worcester, Massachusetts
1	Comparator	Jones & Lamson Machine Company Springfield, Vermont
1	Comparator	Jones & Lamson Machine Company Springfield, Vermont
1	Motor Spindle Drilling Machine	Leland-Gifford Co. Worcester, Massachusetts
15	#711 F Indicator	L. S. Starrett Company Athol, Massachusetts
10	Sine Bars	Taft-Peirce Manufacturing Company
5	Sine Blocks	Woonsocket, Rhode Island
10	14" x 14" Scraped Surface Plates	Brown & Sharpe Manufacturing Co. Providence, Rhode Island
5	24" x 36" Scraped Surface Plates	Brown & Sharpe Manufacturing Co. Providence, Rhode Island

(2) Miscellaneous Current Procurement Activities (continued)

Quanti	Item	Facility
1	Comparator	Jones & Lamson Machine Company Springfield, Vermont
1	14" x 14" L ing Plate	Taft-Peirce Manufacturing Company Woonsocket, Rhode Island
4	Micro Proje r	R. S. Wilder Company Waltham, Massachusetts

TOTAL NUMBER O NVITATIONS TO NEGOTIATE - 58
TOTAL NUMBER O WARDS MADE - 39

SMALL ARMS DIV ON

A. New Negoti ons During Period Covered by This Report

Quanti	Item
829,03	Scabbards, yonet, M3
32,00	Scabbards, yonet, M3
408,90	Magazines, round, for Thompson Sub-Machine Gun, Cal. .45
2,62	Browning A matic Rifles, Cal. .30 M1918A2, plus spare parts.
12,50	Johnson Li Machine Guns, Cal. .30, plus spare parts.
124,10	Rifles, Ca .30, Semi-Automatic, Johnson, Type R, with spare part accessories, and assemblies.

B. Proposals mitted to Washington During Period Covered by This Re t

Quanti	Item	Facility
	Johnson Li Machine Gun Cal. .30	Johnson Automatic, Inc. Boston, Massachusetts
6,27	Pistol, V , M5	Harrington & Richardson Arms Co. Worcester, Mass.
408,90	Magazine, round, for Thompson -Machine Gun, Cal. .45	Worcester Pressed Steel Company, Worcester, Massachusetts
112,50	Johnson S -Automatic Rifle, Ca .30, M2 plus spare par	Johnson Automatics, Inc. Boston, Massachusetts
200,00	Scabbard, onet, M1917	Beckwith Manufacturing Co. Dover, New Hampshire
829,03	Scabbard, onet, M3	Beckwith Manufacturing Co. Dover, New Hampshire
32,00	Scabbard, onet, M3	Beckwith Manufacturing Co. Dover, New Hampshire

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

C. Proposals Submitted to Denver Ordnance Plant During Period Covered by This Report

Quantity	Item	Facility
150	Cal. .30 Perishable Tools	E. V. Barwell Company Providence, Rhode Island

TOTAL NUMBER OF INVITATIONS TO NEGOTIATE -- 27
TOTAL NUMBER OF AWARDS MADE -- 31

MACHINE TOOLS
Defense Aid

Reports of awards have been submitted to Washington to cover the requisitions shown opposite each of the following companies:

Company	U. K. Requisition Number
Abrasive Machine Tool Company	50882, 51420, 51434
B. C. Ames Company	51372
Avion Machine Tool Company	51213
John Bath & Company	51407
Bay State Stamping Company	51453
Edward Blake Company	50619, 50709
Blanchard Machine Company	51061, 51277
Brown & Sharpe Manufacturing Company	50711, 50735, 50761, 50811, 51235, 51436, 51477, 51512, 51153, 51155, 51223, 51234, 51623, 51651, 51703, 51893
Bryant Chucking Grinder Company	50451, 50698, 51146, 51304 51384, 51657
Cone Automatic Machine Company	10958, 50797, 51294
Edward N. Cook Plate Company	50783
Calvin Dean, Incorporated	50644
Federal Products Corporation	51376, 51634
Follows Gear Shaper Company	51058, 51283, 51661, 51748
Fitchburg Grinding Machine Corporation	51302, 51362
Henry L. Hanson Company	50824, 51259, 51317
The Heald Machine Company	50455, 50677, 50790, 51107, 51230, 51291, 51498, 51514, 51517, 51637
Jones & Lamson Machine Company	50421, 50643, 50891, 51143, 51335, 51412
The Lapointe Machine Tool Company	51226
Leland-Gifford Company	51068
Liberty Tool & Gage Works	51197

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Company	U. K. Requisition Number
Morse Twist Drill & Machine Company	5077-Al, 50762, 51212, 51638
Mossberg Pressed Steel Corporation	40028
W. H. Nichols Company	50676
Norton Company	9847-Al, 50217, 50279, 50340, 50572, 50725, 50943, 51182, 51232, 51584, 51642, 51820
Potter & Johnston Machine Company	51354, 51765
Reed-Prentice Corporation	51132, 51577
Rivett Lathe & Grinder, Incorporated	50866
Scott & Williams	51207
Standard Machinery Company	51210
The L. S. Starrett Company	51382, 51616, 51767
Taft-Peirce Manufacturing Company	50947, 51069
Union Twist Drill Company	51404, 51452, 51573, 51719, 51755
U. S. Automatic Box Machinery Company	51217
Wade Tool Company	51303
Waltham Dial Gage Company	51484
Winona Tool Manufacturing Company	51231
Winter Brothers Co.	51198, 51247, 51442

Company	R. Requisition Number
American Electric Furnace Company	10087
Builders Iron Foundry	2069
Cone Automatic Machine Company	2078
L. F. Fales Machine Company	10087
Fay & Scott	10087
Fellows Gear Shaper Company	10066, 10081
Heald Machine Company	1621, 2342, 10073, 10074
Lapointe Machine Tool Company	2008, 2009, 2010
Norton Company	2029, 2030, 10120
Potter & Johnston Machine Company	10060, 10061, 10062
Reed-Prentice Corporation	412, 413, 414, 416, 789, 2146, 2147, 2148, 10056, 10058, 10059, 10119
Rivett Lathe & Grinder, Incorporated	2082

Company	T. Requisition Number
Norton Company	14

Reports of awards will be submitted shortly to cover the requisitions shown opposite each of the following companies:

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5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Company	U. K. Requisition Number
Abrasive Machine Tool Company	51881
B. C. Ames Company	51644
Arter Grinding Machine Company	51289
Blanchard Machine Company	52076
Brown & Sharpe Manufacturing Company	51268, 51603, 51707, 51872, 51878, 51888, 51958, 52049, 52061
Bryant Chucking Grinder Company	51935, 51961
Fellows Gear Shaper Company	51822, 51943, 51965
The Heald Machine Company	10080, 51491, 51493, 51513, 51599, 51641, 51655, 51789, 51815, 51860, 51894, 51954, 52003, 52009, 52111, 52135
Jones & Lamson Machine Company	50816, 51256, 51356, 51608, 51821, 51874
The Lapointe Machine Tool Company	51704
Leland-Gifford Company	51740, 51808
Morse Twist Drill & Machine Company	51463, 51531, 51917, 51947
Narragansett Machine Company	51978
W. H. Nichols Company	51241
Norton Company	51149, 51979, 52069
Reed Prentice Corporation	51855
Rivett Lathe & Grinder, Incorporated	51951
Rolled Thread Die Company	51984
J. T. Slocomb Company	52062
L. S. Starrett Company	51408, 51537, 51877, 52092
Taft-Peirce Manufacturing Company	50920, 51629, 52037
Union Twist Drill Company	51770, 51829, 51871
Winter Brothers Company	51968, 52021

Company	R. Requisition Number
Arter Grinding Machine Company	1332

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5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Company	R. Requisition Number
Brown & Sharpe Manufacturing Company	776, 10033, 10034, 10037, 10038, 10240, 10248, 10325, 10326
Builders Iron Foundry	10091
Cone Automatic Machine Company	10241
Fitchburg Grinding Machine Corporation	1614
Franklin Machine & Foundry Company	10285
The Heald Machine Company	10247, 10252
Jones & Lamson Machine Company	87, 1950, 1951, 1952, 1953, 1954, 1955, 10077, 10084, 10085
The Lapointe Machine Tool Company	10145, 10146, 10147, 10291
Norton Company	2031, 10268, 10324
Reed-Prentice Corporation	1638, 2139, 2149, 2150, 2151, 2152, 10299, 10300
Reid Brothers Company, Incorporated	1710, 10137
Rivett Lathe & Grinder, Incorporated	10118

TOTAL NUMBER OF INVITATIONS TO NEGOTIATE

United Kingdom Requisitions	129	
Russian Requisitions	46	
Total		175

TOTAL NUMBER OF AWARDS MADE

United Kingdom	110	
Russian	33	
Turkey	1	
Total		144

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
302	Independent Lock Company, Fitchburg, Mass.	965,000.00	Fuze, P.D. M52 (Metal Parts)	4/25/42 Completed 4/22/42
303	Wright Machine Company, Worcester, Mass.	1,100,070.00	Booster, M20 (Metal Parts)	3/42
308	National Fireworks, Inc. W.Hanover, Mass.	667,014.20	Ground Signals, M20 and M21	5/42 Complete 3/31/42
318	Reed Prentice Corp. Worcester, Mass.	2,556,200.00	Lathes	Shipped as needed
324	United Shoe Machinery Corp., Beverly, Mass.	116,025.38	Supplemental parts for Guns, 37mm. M3 and M5	4/21/42
325	United Shoe Machinery Corp., Beverly, Mass.	3,135,122.44	Guns, 37mm. M3 with extra parts and facilities	10/31/42
327	Cone Automatic Machine Company, Windsor, Vermont	2,640,000.00	Machine Tools	8/1/42
328	Framanco Company Framingham, Mass.	545,670.00	Shell, 20mm. Mk. 1 H.E. (Metal Parts)	5/42
332	Automatic Machine Products Company, Attleboro, Mass.	621,756.00	Primer Percussion, M1B1A1 (Metal Parts)	10/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

[illegible]	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
334	Waltham Watch Company, Waltham, Mass.	150,530.40	Fuze, B.D., M58 (Metal Parts)	5/42
335	Kingsbury Machine Tool Corp. Keene, N. H.	1,180,282.00	Drilling Machines	6/6/42
344	Cohn & Rosenbergor Company, Providence, Rhode Island	220,000.00	Fuze, B.D., M58 (Metal Parts)	2/43
344 Cohn & Rosenberger, P.O. 23125	H. & H. Screw Products Mfg. Company, N. Providence, Rhode Island	126,400.00	Parts for Fuze, B.D. M58	8/11/42
348	National Fireworks, Inc. W. Hanover, Mass.	288,103.02	Ground Signals, M17, M19, M20	1/42
350 DA 102	Beckwith Mfg. Company, Hudson, Mass.	1,248,437.00	Scabbard, Bayonet, M3	10/30/42
350 DA 102 Beckwith, P.O. 5307, U-1049	New England Pressed Steel Company, Natick, Mass.	308,194.85	Plate, top Assembly C 76847 for Scabbard, Bayonet, M3	10/30/42
352	United Shoe Machinery Corp. Beverly, Mass.	357,125.00	Tubes for Gun, 37mm., M4	2/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
356	S. A. Woods Machine Company Boston, Mass.	1,696,400.00	Shot, S.A.P. M72, 75mm., Gun (Metal Parts)	6/42
361	Wm. E. Wright & Sons Company, West Warren, Mass.	290,500.00	Parachutes for Flare, Aircraft, M26	6/42
365	Draper Corp. Hopedale, Mass.	132,500.00	Shot, S.A.P. 37mm. M74 (Metal Parts)	6/30/42
366	Cone Automatic Machine Company, Windsor, Vermont	660,000.00	Machine Tools	11/30/42
368	Wright Machine Company, Worcester, Mass.	187,200.00	Booster, M20 (Metal Parts)	5/42
371	Pantex Pressing Machine Company, Central Falls, Rhode Island	285,331.00	Shot, A. P. 20mm., M75 (Metal Parts)	8/42
378	Automatic Machine Products Company, Attleboro, Mass.	312,000.00	Primer Percussion M1B1A1 (Metal Parts)	7/42
381 DA-206	Draper Corp. Hopedale, Mass.	5,225,221.77	Howitzer, Pack, 75mm., M1A1	6/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
384	Wright Machine Company, Worcester, Mass.	414,000.00	Fuze, P.D., M56 (Metal Parts)	12/42
385	United Shoe Machinery Corp. Beverly, Mass.	7,316,450.00	Guns, 37mm., M3 and Spare parts	3/43
387	S. A. Woods Machine Company, Boston, Mass.	1,620,000.00	Shell, 3" H.E. M42 A1	8/42
388	S. A. Woods Machine Company, Boston, Mass.	2,601,187.00	Shot, A.P. M72, 75mm., Gun (Metal Parts)	10/42
389	Independent Lock Company, Fitchburg, Mass.	334,000.00	Fuze, P.D., M52 (Metal Parts)	8/15/42
390	Independent Lock Company, Fitchburg, Mass.	386,000.00	Fuze, P.D., M57 (Metal Parts)	8/42
391	Wright Machine Company, Worcester, Mass.	420,000.00	Fuze, P.D., M57 (Metal Parts)	8/42
397	H. & B. American Machine Company, S. Attleboro, Mass.	3,103,515.00	Shot, S.A.P. 75mm., M72 (Metal Parts)	10/42
398	Saco Lowell Shops, Biddeford, Maine	3,414,256.81	Carriage, Gun, 37mm., M4	2/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
398 Saco Lowell P.O. 17507-GC 17508-GC	Eastern Tool & Stamping Company, Saugus, Mass.	161,690.00 119,040.00	Plates C 68301 Levers A 168957 for Carriage, Gun, 37mm., M4	9/24/42
401	Rhode Island Fabrics Company, Pawtucket, Rhode Island	357,500.00	Cloth, Cartridge Grade C	7/15/42
402	Pantex Pressing Machine Company, Central Falls, Rhode Island	811,774.00	Shot, A.P., 20mm., M75 (Metal Parts)	11/42
404	Albert & J. M. Anderson Mfg. Company, Boston, Mass.	330,000.00	Case, Cartridge, 3" A.A. Mk 2 M2	4/1/42 Completed 5/8/42
407	A. S. Campbell Company, Inc. E. Boston, Mass.	251,189.45	Case, Cartridge, 20mm., M21 Hispano Gun/A	9/42
409	Persons, Majestic Mfg. Company, Worcester, Mass.	420,000.00	Shell, 20mm., H.E. Mk. 1 (Machining)	6/42
414	Waltham Watch Company, Waltham, Mass.	140,000.00	Fuze, B.D., M58 (Metal Parts)	9/1/42
415	Cohn & Rosenberger Company, Providence, Rhode Island	161,700.00	Fuze, B.D., M58 (Metal Parts)	11/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-[illegible]-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
420	Harrington & Richardson Arms Company, Worcester, Mass.	191,878.50	Pistol, Very, 10 Gage, Mk V	8/42
429	Wright Machine Company, Worcester, Mass.	325,603.20	Booster, M20 A1 (Metal Parts)	5/42
436	Freeman Daughaday Company, Providence, Rhode Island	397,620.00	Fuze, Bomb Nose, AN-M103 (Metal Parts)	9/42
438	Rivett Lathe & Grinder Company, Brighton, Mass.	149,663.00	Grinders, Lathes and Equipment	8/31/42
440	Taft-Peirce Mfg. Company, Woonsocket, Rhode Island	161,278.00	Gages	7/10/42
441	Heald Machine Company, Worcester, Mass.	159,502.00	Internal Grinding Machines	6/19/42
446	Brown & Sharpe Mfg. Company, Providence, Rhode Island	494,948.52	Grinding machines and Surface Plates	1/31/43
448	United Shoe Machinery Corp. Beverly, Mass.	12,099,810.72	Guns, 37mm., M8 with spare parts	10/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
449	United Shoe Machinery Corp. Beverly, Mass.	9,219,902.20	Guns, 37mm., M3 with spare parts and facilities	8/43
451	C. H. Cowdrey Machine Works, Fitchburg, Mass.	1,500,000.00	Guns, 75mm., M3	10/42
452	Draper Corp., Hopedale, Mass.	4,274,638.10	Howitzer, Pack, 75mm., M1A1	9/43
454	Worcester Pressed Steel Company, Worcester, Mass.	128,700.00	Magazines, Thompson Machine Gun Sub (20 Round)	7/42
456	Ward Machine Company, Brockton, Mass.	401,450.00	Tracer and Igniter, Shell, No. 12 Mk. I/L/40mm.	9/42
457	Wright Machine Company, Worcester, Mass.	268,320.00	Booster M20A1 (Metal Parts)	8/42
458	Cohn & Rosenberger Company, Providence, Rhode Island	656,250.00	Fuze, Bomb Nose, AN-M103, (Metal Parts)	9/42
459	Keystone Mfg. Company, Dorchester, Mass.	952,047.41	Fuze, Bomb Nose, AN-M103, (Metal Parts)	9/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-Cl-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
460	Fram Corp., E. Providence, Rhode Island	651,000.00	Fuze, Bomb Nose, AN-M103 (Metal Parts)	10/1/42
461	Warren Telechron Company, Ashland, Mass.	832,000.00	Fuze, Bomb Nose, AN-M103 (Metal Parts)	10/1/42
462	Heywood-Wakefield Company, Gardnor, Mass.	882,952.00	Fuze, Bomb Nose, AN-M103 (Metal Parts)	8/42
463	Albert & J. M. Anderson Mfg. Company, Boston, Mass.	165,000.00	Case, Cartridge, 3" A.A. Mk.2 M2	5/42
464	Donnison Mfg. Company, Marlboro, Mass.	125,493.00	Carton, Packing for 20mm., Hispano Gun/A/	11/42
470	Independent Lock Company, Fitchburg, Mass.	100,676.03	Fuze, P.D. M52 (Metal Parts)	5/42
*471	Norton Company Worcester, Mass.	413,755.00	Surface Grinders	9/30/42
472	Cambridge Screw Company, Cambridge, Mass.	640,875.00	Primer, Percussion, M23A1 (Metal Parts)	12/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
476	Cowdrey Machine Div., American Type Founders, Fitchburg, Mass.	3,566,800.00	Guns, M2 75mm., and extra parts	8/42
479	Albert & J. M. Anderson Mfg. Company, Boston, Mass.	143,750.00	Case, Cartridge, 37mm., M16	1/15/43
480	Wright Machine Company, Worcester, Mass.	936,000.00	Booster, M20A1 (Metal Parts)	12/1/42
481	Automatic Machine Products Company, Attleboro, Mass.	510,000.00	Primer, Percussion, M1B1A2 (Metal Parts)	10/1/42
482	Keystone Mfg. Company, Dorchester, Mass.	470,866.00	Shell, H.E., 37mm., M63	1/1/43
484	Shawmut Woolen Mills, Stoughton, Mass.	295,050.00	Parachute for Bomb M40	9/1/42
485	F. L. & J. C. Codman Company, Rockland, Mass.	144,450.00	Parachute for Bomb M40	10/1/42
487	Stevens Waldon, Inc. Worcester, Mass.	783,000.00	Shot, S.A.P. 37mm., M74 (Metal Parts)	12/1/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-211-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
488	Draper Corp. Hopedale, Mass.	223,125.00	Shot, S.A.P. 37mm., M74 (Metal Parts)	1/1/43
491	Warren Telechron Company, Ashland, Mass.	390,000.00	Fuze, P.D. M64 (Metal Parts)	9/42
492	Morse, Lockhart & Morse, Inc. Boston, Mass.	267,000.00	Fuze, P.D. M64 (Metal Parts)	9/42
493	Matthews Mfg. Company, Worcester, Mass.	193,369.00	Fuze Seat Liners for Bombs	11/42
494	Worcester Stamped Metal Company, Worcester, Mass.	197,400.00	Fuze Seat Liners for Bombs	9/42
495	Parker & Harper Mfg. Company, Worcester, Mass.	625,000.00	Shell, 20mm., H.E. Mk. 1 (Metal Parts)	12/42
496	Arnold Copeland Company, Inc. Boston, Mass.	151,770.00	Primer, Percussion, M31A1	11/1/42
503	Waltham Watch Company, Waltham, Mass.	315,536.00	Fuze, B.D., M58 (Metal Parts)	10/42
504	S. A. Woods Machine Company, Boston, Mass.	2,112,000.00	Shot, S.A.P., 75mm., M72 (Metal Parts)	12/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
505	H. & B. American Machine Company, Pawtucket, Rhode Island	1,760,000.00	Shot, S.A.P. 75mm., M72 (Metal Parts)	1/43
*507	Taft-Peirce Mfg. Company, Woonsocket, Rhode Island	128,326.00	Gage Mfg. Building	7/15/42
512	Wright Machine Company, Worcester, Mass.	263,883.75	Fuze, P.D., M56 (Metal Parts)	2/1/43
515	Cummings Machine Works, Boston, Mass.	645,100.20	Mount, Telescope, M24	5/43
518	Thomas French & Sons, Ltd., Fall River, Mass.	700,000.00	Belts, Amm. Cal. .30 M1917 (250 Rounds)	10/15/42
522	Independent Lock Company, Fitchburg, Mass.	292,500.00	Tracer and Igniter, Shell, No. 12, Mk 1/L (Metal Parts)	12/42
523	Cohn & Rosenberger Company, Providence, Rhode Island	300,000.00	Tracer and Igniter, Shell, No. 12, Mk 1/L (Metal Parts)	12/42
*523 Cohn & Rosenberger P.O. 5652	M. & A. Mfg. Company, Peabody, Mass.	120,000.00	Bodies, 73-17-6 A for Tracer and Igniter, Shell No.12 Mk I/L/ Internal (40mm)	12/42

Monthly Report, May

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

W-241-ORD	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
524	Lundquist Tool & Mfg. Company, Worcester, Mass.	247,250.00	Mount, Telescope, M19	8/1/43
525	Murdock Webbing Company, Central Falls, Rhode Island	339,200.00	Belt, Ammunition, Cal. .30 M1917 (250 Rounds)	10/1/42
526	International Braid Company, Providence, Rhode Island	650,000.00	Belt, Ammunition, Cal. .30 M1917 (250 Rounds)	9/42
528	S. A. Woods Machine Company, Boston, Mass.	4,997,079.20	Shell, H.E., 75mm., M48	6/43
530	Greenville Mills, Inc. Greenville, N. H.	151,672.50	High Tenacity Rayon Cloth for Bomb Parachutes	9/42
531	Westover Fabrics, Inc. Boston, Mass.	149,850.00	High Tensile Rayon Cloth for Bomb Parachutes	9/42
536	Geo. Knight & Company, Brockton, Mass.	286,676.10	Primer, Percussion, M22A3 (Metal Parts)	4/43
537	T. W. Foster & Bros. Company, Inc., Providence, Rhode Island	304,279.23	Primer, Percussion, M22A3 (Metal Parts)	5/43

Monthly Report, May

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
538	Automatic Machine Products Company, Attleboro, Mass.	510,000.00	Primer, Percussion, M1B1 A2 (Metal Parts)	11/42
539	Whitin Machine Works, Whitinsville, Mass.	468,000.00	Shot, A. P. 37mm., M74 (Metal Parts)	5/43
606	Bird & Son, Inc. East Walpole, Mass.	1,285,383.00	Shell, Q.F., H.E., 40mm., Mk II T/L (Metal Parts)	6/1/43
*606 Bird & Son Inc. P.O.81625	Revere Copper & Brass Company, Inc. New Bedford, Mass.	150,000.00	Rotating Bands for Shell, Q.F., H.E., 40mm. Mk 2 T/L	4/43
609	T. W. Foster & Bros. Company, Inc., Providence, Rhode Island	120,975.00	Primer, Percussion, M31A2 (Metal Parts)	2/43
613	P. F. Hesse Narrow Fabric Company, Pawtucket, Rhode Island	252,000.00	Belt, Ammunition, Cal. .30, M1917 (250 Rounds)	9/30/42
619	U. S. Rubber Company, Bristol, Rhode Island	787,600.00	Machinery to produce Fire Control Cable	In-stallation in one year.
620	Wright Machine Company, Worcester, Mass.	2,295,000.00	Booster, M20A1 (Metal Parts)	3/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
621	Hersey Mfg. Company, Boston, Mass.	487,500.00	Primer, Percussion, M28 A2 (Metal Parts)	1/43
622	D. M. Watkins Company, Providence, Rhode Island	184,000.00	Primer, Percussion, M28 A2 (Metal Parts)	2/1/43
623	Independent Lock Company, Fitchburg, Mass.	1,650,000.00	Fuze, P.D., M52 B1	3/1/43
624	George C. Moore Company, Westerly, Rhode Island	800,000.00	Ammunition Belts, Cal. .30 M1917 (250 Round)	9/42
626	New England Small Arms Corp., Providence, Rhode Island	9,178,927.68	Browning Automatic Rifle, (M1918 and M1918 A2)	1/43
630	Pantex Pressing Machine Company, Pawtucket, Rhode Island	136,300.00	Shot, A. P. 20mm., M75	12/42
632	Persons Majestic Mfg. Company, Worcester, Mass.	208,000.00	Shell, H.E., 20mm., Mk 1	1/43
633	Peace Dale Braiding Company, Shannock, Rhode Island	188,500.00	Cordage, Rayon, High Strength, Braided, Type "A"	9/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
634	International Braid Company, Providence, Rhode Island	209,815.00	Cordage, Rayon, High Strength, Braided, Type "A"	9/42
635	Parker & Harper Mfg. Company, Worcester, Mass.	381,000.00	Shell, H. E., 20mm., M1/A/	4/43
637	S. A. Woods Machine Company, Boston, Mass.	1,755,000.00	Shell, H.E., 3", M42 A1 (Complete)	2/43
639	Cambridge Screw Company, Cambridge, Mass.	240,125.00	Primer, Percussion, M23 A2	4/43
643	United Shoe Machinery Corp. Beverly, Mass.	545,000.00	Expansion of facilities for producing Guns, 37mm.	
644	Narragansett Machine Works, Pawtucket, Rhode Island	250,000.00	Facilities for producing Mount T55, M24, M3	4/16/43
648	Worcester Stamped Metal Company, Worcester, Mass.	174,568.72	Fuze Seat Liner	12/42
*649	Waltham Watch Company, Waltham, Mass.	980,000.00	Fuze, B.D., M58 (Metal Parts)	6/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
*650	Worcester Taper Pin Company, Worcester, Mass.	450,000.00	Tracer and Igniter, Shell No. 12 Mk I/L	5/43
*664	Crompton & Knowles Loom Works, Worcester, Mass.	446,750.00	Tracer and Igniter, Shell No. 12 Mk I/L	5/43
*665	Wright Machine Company, Worcester, Mass.	490,000.00	Fuze, P.D., M57 (Metal Parts)	11/42
*666	Independent Lock Company, Fitchburg, Mass.	522,500.00	Fuze, P.D., M57 (Metal Parts)	4/43
*668	H. & B. American Machine Company, Attleboro, Mass.	1,509,893.95	Shot, A. P., 90mm., M77 (Metal Parts)	9/43
*669	Hersey Mfg. Company, Boston, Mass.	155,250.00	Primer, Percussion, M38 (Metal Parts)	11/43
*670	Automatic Machine Products Company, Attleboro, Mass.	150,000.00	Primer, Percussion, M38 (Metal Parts)	9/43
*671	United Shoe Machinery Corp. Beverly, Mass.	3,400,000.00	Development and Engineering Services	

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Current Procurement				
*692	American Wringer Company, Woonsocket, Rhode Island	1,553,254.75	Shot, A. P., 57mm., M70 (Metal Parts)	5/43
*693	Keystone Mfg. Company, Boston, Mass.	439,650.00	Shell, H.E., 37mm., M63 (Metal Parts)	10/43
*698	Wm. E. Wright & Sons Company, W. Warren, Mass.	120,980.00	Parachutes for flare, Aircraft, M26	6/42
*927 DA 686	Beckwith Mfg. Company, Hudson, Mass.	704,683.15	Scabbard, Bayonet, M3	5/43

DA W-241-ORD-	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
5	National Fireworks, Inc. W. Hanover, Mass.	1,625,000.00	Loading 2 Pounder Anti Tank Ammunition	6/43
8	A. S. Campbell Company, Inc. East Boston, Mass.	1,880,736.00	Case, Cartridge, 20mm., M21 Hispano Gun/A	9/42
11	Bryant Chucking Grinder Company, Springfield, Vermont	116,669.50	Hole Grinders	6/8/42 Completed 5/9/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
19	Stevens Walden, Inc. Worcester, Mass.	174,688.35	Dies, Collets, and Punches	2/1/42 Completed 4/14/42
20	Heald Machine Company, Worcester, Mass.	130,402.00	Grinding Equipment	1/9/42 Completed 12/41
21	Potter & Johnston Machine Company, Pawtucket, Rhode Island	194,785.00	Lathes	3/19/42 Completed 2/14/42
25	Potter & Johnston Machine Company, Pawtucket, Rhode Island	179,284.00	Lathes	6/30/42 Completed 4/28/42
35	Brown & Sharpe Mfg. Company, Providence, Rhode Island	657,611.00	Machine Tools	5/18/42 Completed 1/12/42
48	Excel Foundry & Machine Company, Fall River, Mass.	2,503,759.40	Fuze, DA & Percussion No. 119 Mk IV/L & Exploder Shell "B" Mk VI Loading	7/42
50	Heald Machine Company, Worcester, Mass.	753,220.00	Grinding Equipment	6/30/42 Completed 1/30/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
66	Fitchburg Grinding Machine Company, Fitchburg, Mass.	109,490.00	Universal Grinders	6/42
68	Builders Iron Foundry, Providence, Rhode Island	102,555.00	Drilling Machines	Completed 3/31/42
75	Jones & Lamson Machine Company, Springfield, Vermont	169,148.00	Lathes	6/43
86	Florence Stove Company, Gardner, Mass.	536,250.00	Boxes and containers for 2 Pounder Ammunition	4/42
91	Brown & Sharpe Mfg. Company, Providence, Rhode Island	183,863.00	Machine Tools	9/42
92	Brown & Sharpe Mfg. Company, Providence, Rhode Island	1,026,518.00	Machine Tools	7/31/42
105	National Fireworks, Inc. West Hanover, Mass.	167,200.45	Wooden Crates and Packing Material for 75mm. H. E. Ammunition	3/42

Monthly Report, May-

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
124	Potter & Johnston Machine Company, Pawtucket, Rhode Island	536,910.00	Lathes	8/31/42
147	National Fireworks, Inc. West Hanover, Mass.	627,900.00	Load Shell, B.L., H.E. Streamline 5.5" Mk. 1 D/L	12/42
150	Heald Machine Company, Worcester, Mass.	216,220.00	Grinding Equipment	8/8/42
151	Norton Company, Worcester, Mass.	116,568.50	Grinding Machines	5/42
163	National Fireworks, Inc. W. Hanover, Mass.	470,400.00	Fuze, Percussion, #231, Mk III/L Loading	4/42
173	Brown & Sharpe Mfg. Company, Providence, Rhode Island	993,053.84	Machine Tools	5/30/42
178	Jones & Lamson Machine Company, Springfield, Vermont	309,646.80	Lathes	12/31/42
180	Reed Prentice Corp. Worcester, Mass.	158,211.65	Lathes	2/28/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
193	Brown & Sharpe Mfg. Company, Providence, Rhode Island	277,320.00	Machine Tools	4/30/42 Completed 4/18/42
194	Whitin Machine Works, Whitinsville, Mass.	208,000.00	Projectile, Ball, 20mm., (Metal Parts)	10/42
198	Jones & Lamson Machine Company, Springfield, Vermont	146,244.00	Lathes	11/30/42
199	Brown & Sharpe Mfg. Company, Providence, Rhode Island	546,555.00	Machine Tools	6/30/42
200	Potter & Johnston Machine Company, Pawtucket, Rhode Island	104,128.00	Lathes	7/31/42
207	Fellows Gear Shaper Company, Springfield, Vermont	359,420.00	Gear Shapers	2/8/42
211	Cone Automatic Machine Company, Windsor, Vermont	330,000.00	Machine Tools	6/30/42
213	Jones & Lamson Machine Company, Springfield, Vermont	151,918.00	Lathes	7/31/42

Monthly Report, May

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA 7-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
*247	Lapointe Machine Tool Company, Hudson, Mass.	133,670.00	Broaching Machines	2/28/43
*253	Lapointe Machine Tool Company, Hudson, Mass.	238,704.00	Broaching Machines	4/30/43
*254	Lapointe Machine Tool Company, Hudson, Mass.	335,225.00	Broaching Machines and Accessories	3/31/43
*281	Heald Machine Company, Worcester, Mass.	114,495.00	Grinders	9/42
286	Norton Company, Worcester, Mass.	222,180.00	Grinding Machines	8/31/42
288	Jones & Lamson Machine Company, Springfield, Vermont	159,300.00	Lathes	9/42
295	Heald Machine Company, Worcester, Mass.	118,012.00	Boromatics	6/42
308	Brown & Sharpe Mfg. Company, Providence, Rhode Island	221,478.00	Machine Tools	10/19/42
323	Henry L. Hanson Company, Worcester, Mass.	116,409.00	Taps and Dies	8/31/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

D.[illegible]-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
339	Morse Twist Drill & Machine Company, New Bedford, Mass.	165,943.98	Small Tools for Standard Machine Tools	2/23/43
345	J. T. Slocomb Company, Providence, Rhode Island	115,700.00	Drills, Center, H. S. S. Comb.	6/1/42
382	Builders Iron Foundry, Providence, Rhode Island	425,795.00	Surface Grinders and Deep Hole Drilling Machines	5/42
393	Brown & Sharpe Mfg. Company, Providence, Rhode Island	132,349.00	Attachments for Machine Tools	2/43
394	Builders Iron Foundry, Providence, Rhode Island	471,730.00	Chamfering Machines & Reaming Machines	3/31/42
396	Stevens Walden, Inc., Worcester, Mass.	236,300.00	Shot, S.A.P. 37mm., M74 (Metal Parts)	8/42
410	Builders Iron Foundry, Providence, Rhode Island	155,486.00	Chamfering Machines and Reaming Machines	

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

D.. ..-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
411	Bryant Chucking Grinder Company, Springfield, Vermont	236,105.00	Machine Tools	
419	Brown & Sharpe Mfg. Company, Providence, Rhode Island	300,584.00	Machine Tools	12/30/42
431	J. T. Slocomb Company, Providence, Rhode Island	167,400.00	Center Drills	7/20/42
442	Cone Automatic Machine Company, Windsor, Vermont	179,196.00	Auto. Screw Machines	11/42
445	Cone Automatic Machine Company, Windsor, Vermont	216,576.00	Auto. Screw Machines	12/42
456	Reed Prentice Corp. Worcester, Mass.	126,000.00	Milling Machines and Equipment	8/31/42
475	Bryant Chucking Grindor Company, Springfield, Vermont	299,908.50	Machine Tools	8/31/42
476	Bryant Chucking Grinder Company, Springfield, Vermont	556,976.00	Hydraulic Hole Grinders	8/31/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

D[illegible]-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
482	The Fellows Gear Shaper Company, Springfield, Vermont	183,760.00	Gear Shapers	11/10/42
484	Bryant Chucking Grinder Company, Springfield, Vermont	229,485.00	Grinding Machines	9/30/42
487	C. & W. Tool Company, Cambridge, Mass.	193,042.90	Cutters and Reamers	9/7/42
509	United Shoe Machinery Corp. Beverly, Mass.	2,060,251.40	Guns, 37mm., M6	12/42
512	The Fellows Gear Shaper Company, Springfield, Vermont	301,920.00	Gear Shapers	5/31/42
*513	Reed Prentice Corp. Worcester, Mass.	463,712.00	Lathes	12/31/42
514	Heald Machine Company, Worcester, Mass.	226,399.00	Grinding Machines	6/42
526	Brown & Sharpe Mfg. Company, Providence, Rhode Island	110,825.58	Parts for Auto. Screw Machines	12/18/42

Monthly Report, May

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

W-341-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
*541	Cone Automatic Machine Company, Windsor, Vermont	670,887.76	Auto. Screw Machines	12/31/42
*552	Brown & Sharpe Mfg. Company, Providence, Rhode Island	145,798.34	Attachments for Auto. Screw Machines	10/6/42
558	Heald Machine Company, Worcester, Mass.	124,651.50	Grinding Machines	7/16/42
*561	Brown & Sharpe Mfg. Company, Providence, Rhode Island	419,713.91	Attachments for Auto. Screw Machines	1/10/43
*569	Blanchard Machine Company, Cambridge, Mass.	131,328.00	Surface Grinders	7/27/42
*573	Reed Prentice Corp. Worcester, Mass.	151,150.00	Milling Machines	9/30/42
*574	Brown & Sharpe Mfg. Company, Providence, Rhode Island	174,438.00	Auto. Screw Machines	12/21/42
577	Jones & Lamson Machine Company, Springfield, Vermont	165,341.50	Turret Lathes	6/30/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
*580	Brown & Sharpe Mfg. Company, Providence, Rhode Island	411,562.00	Auto. Screw Machines	4/12/43
*584	Lapointe Machine Tool Company, Hudson, Mass.	148,100.00	Broaching Machines	4/30/43
*587	Heald Machine Company, Worcester, Mass.	312,532.90	Internal Grinding Machines	10/5/42
*W-241-ORD-587	Morse Twist Drill & Machine Company, New Bedford, Mass.	239,605.83	Drills	10/22/42
*W-241-ORD-590	Norton Company, Worcester, Mass.	287,807.00	Grinding Machines	6/30/42
DA W-241-ORD-				
*599	Norton Company, Worcester, Mass.	224,261.06	Grinding Machines	1/30/43
617	Cone Automatic Machine Company, Windsor, Vermont	208,176.00	Screw Machines	11/30/42
*626	Heald Machine Company, Worcester, Mass.	174,800.00	Boromatics	6/15/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

DA W-241-ORD-	Plant	Value $	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
*639	Lapointe Machine Tool Company, Hudson, Mass.	101,920.50	Broach Sharpeners	7/31/43
*640	Brown & Sharpe Mfg. Company, Providence, Rhode Island	329,022.50	Milling Machines	3/31/43
641	Waltham Watch Company, Waltham, Mass.	170,000.00	Fuze, Percussion, D.A., #253, M1/A/ Empty	12/42
642	Crompton-Knowles Loom Works, Worcester, Mass.	254,505.00	Shell, H.E., 20mm., Mk.1, Hispano Gun /A/	4/43
*643	Norton Company, Worcester, Mass.	462,171.00	Grinding Machines	11/42
*644	Lapointe Machine Tool Company, Hudson, Mass.	182,977.00	Broaching Machines	11/6/42
*648	Norton Company, Worcester, Mass.	133,103.00	Grinding Machines	12/1/42
*653	Builders Iron Foundry Providence, Rhode Island	112,830.00	Deep Hole Drilling and Reaming Machines	9/30/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

PA W-241-ORD-	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Boston Ordnance District: Defense Aid				
672	National Fireworks, Inc. W. Hanover, Mass.	120,000.00	Load, Assemble, pack and crate Shell, H.E., Mk.1 for Gun, 75mm. M1916 and M1917	4/42
*674	Gorham Mfg. Company, Providence, Rhode Island	1,146,955.00	Case, Cartridge, 37mm. M16 B1, Steel	6/43
*676	Keystone Mfg. Company, Boston, Mass.	245,859.20	Shell, H.E., 37mm., M63 (Metal Parts)	5/43
*W-241-ORD-722	American Electric Furnace Company, Boston, Mass.	262,890.90	Electric Horizontal Rotary Retort Furnaces	8/13/42
Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Chief of Ordnance: Educational Orders				
W-ORD-363	C. H. Cowdrey Machine Works, Fitchburg, Mass.	174,208.50	Howitzer, Pack 75mm., M1A1	9/1/41
W-ORD-425	Waltham Watch Company, Waltham, Mass.	356,085.00	Fuze, Mechanical Time, M43A1	6/13/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Chicago Ordnance District:				
W-271-ORD-577 Revere P.O. 523, 524, 525, 819, 820, 821, 1192, 1193, 1194	Revere Copper & Brass Company, New Bedford, Mass.	712,473.00	Cal. 30 Cartridge Case Cup, Cal. 30 Ball Bullet Jacket Cup, Cal. .50 Bullet Tracer Jacket Cup	6/27/42
W-314-ORD-14184 Williams Oil-O-Matic Htg. Corp. P.O. 47420	U. S. Rubber Company, Bristol, Rhode Island	147,459.03	Transmission Cables for Remote Control Systems, M5	6/15/42
W-271-ORD-1028 Williams Oil-O-Matic Htg. Corp. P.O. 47422	U. S. Rubber Company, Bristol, Rhode Island	266,729.28	Transmission Cables for Remote Control Systems, M5	10/1/42
W-303-ORD-1399 Deere & Co. P.O.M55932	General Electric Company, Lynn, Mass.	401,434.00	Power Generators	4/1/43
Inspection requisitioned by Cincinnati Ordnance District:				
W-294-ORD-830 Inland Mfg. Div.(G.M.C.) P.O.				
D-27644	Reece Button Hole Machine Company, Boston, Mass.	122,221.00	Sears for Carbine, U.S. Cal. .30 M1	5/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Cincinnati Ordnance District:				
D-27645	Reece Button Hole Machine Company, Boston, Mass.	247,473.00	Triggers for Carbine, U.S. Cal. .30 M1	12/42
D-27718	Hemphill Company, Pawtucket, Rhode Island	179,500.00	Hammers for Carbine, U.S. Cal. .30 M1	12/42
D-27724	Worcester Taper Pin Company, Worcester, Mass.	117,250.00	Firing Pins for Carbine, U.S. Cal. .30 M1	4/43
D-30516	Worcester Taper Pin Company, Worcester, Mass.	234,500.00	Gas Cylinders for Carbine, U.S. Cal. .30 M1	12/42
W-294-ORD-909 Marmon Herrington Co.Inc. P.O. D-1350	Narragansett Machine Company, Pawtucket, Rhode Island	605,000.00	T-55 Gun Mount, Assemblies D-47987	12/42
W-294-ORD-918 Oliver Farm Equip. P.O. 5740	Cone Automatic Machine Company, Windsor, Vermont	183,124.00	Machine Tools	
Inspection requisitioned by Detroit Ordnance District:				
W-374-ORD- *1464 Fisher Body P.O. PAD-1631 PAD-1632	Standard Machine Company, Providence, Rhode Island	219,224.00	Bearing Assemblies for Leveling Mechanism	11/16/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Frankford Arsenal:				
W-314-ORD-				
9439 DA-28	Builders Iron Foundry, Providence, Rhode Island	436,830.60	Mount, Telescope, M23	12/31/42
10650	Saco Lowell Shops, Biddeford, Maine	6,439,500.00	Data Transmission Systems, T18	9/42
10650 Saco Lowell P.O. 20050 BB 20054 BB 20055 BB	Simplex Wire & Cable Company, Cambridge, Mass.	567,113.00	Multi Conductor Cable	9/3/42
12470 DA-204	Cummings Machine Works, Boston, Mass.	810,160.40	Mount, Telescope, M26, M27, M28, M29	4/30/43
12582 Gilbert & Barker P.O. 07986 07989 07991 07992 09005 09007	United States Rubber Company, Bristol, Rhode Island	607,551.53	Cable and plug assemblies for T-18 Cable System M1 for 4 Gun Battery	2/43
13096 Williams Oil-O-Matic P.O. 45365	United States Rubber Company, Bristol, Rhode Island	186,526.33	Transmission Cable for Remote Control System	9/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Frankford Arsenal:				
W-314-ORD-				
13431	National Research Corp., Boston, Mass.	150,000.00	Sets Optical Elements, less Reticles and Prisms for Binoculars, M3	6/43
13660 Dictaphone P.O. 8639-8641 inclus.	United States Rubber Company, Bristol, Rhode Island	358,433.00	Cable for M3 Remote Control System	7/1/42
13760	Saco Lowell Shops, Inc. Biddeford, Maine	6,641,171.00	Cable Systems M1 with spare parts	12/42
14056	American Optical Company, Southbridge, Mass.	107,288.00	Lens Generators and Edging Machines #420 & M822	4/18/42
14289 Gilbert & Barker P.O. 13177-13183 inclus.	United States Rubber Company, Bristol, Rhode Island	487,430.00	Conductor Cables for T-18 Cable System M1	2/43
DA-312	Cummings Machine Works, Boston, Mass.	413,638.36	Mount, Telescope, M24	6/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Frankford Arsenal:				
W-314-ORD-				
14474	Great Falls Bleachery & Dye Works, Somerville, N.H.	140,000.00	Cotton Cloth for Bandoleers	7/42
14642	Philmont Mfg. Company, Fall River, Mass.	827,750.00	Bandoleers, M1 6 pocket	7/31/42
14500	Braided Fabric Company, Providence, Rhode Island	164,000.00	Bandoleer, M1 6 pocket	7/31/42
Inspection requisitioned by Hartford Ordnance District:				
W-478-ORD-				
1395 Worthington Pumps P.O. MDQ-5001	Charles E. Crofoot Gear Corp., South Easton, Mass.	123,294.00	Machine Forgings for 90 mm. Gun Mounts	12/42
Worthington Pump P.O. MDQ-15001	Charles E. Crofoot Gear Corp., South Easton, Mass.	117,416.25	Gears and Shafts for 90 mm. Gun, Mounts	2/1/43
*1657	Hoosac Mills Corp. Bradford Dyeing Association Bradford, Rhode Island	299,295.00	Rayon, High Tenacity Cloth for Bomb Parachute	9/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by New York Ordnance District:				
W-613-ORD-				
DA-4	American Cyanamid & Chemical Corp., Maynard, Mass.	640,000.00	Guanadine Nitrate	
DA-169	American Cyanamid & Chemical Corp. Maynard, Mass.	515,200.00	Guanadine Nitrate	7/42
1784 Mack Molding Co. P.O. 1318	Mack Molding Company, Arlington, Vermont	291,600.00	Caps and Casings for M-104 Auxiliary Boosters	4/43
*1826	Greenhalgh Mills, Inc. Pawtucket, Rhode Island	168,750.00	Rayon, High Tenacity, Cloth for Bomb Parachute	9/42
W-314-ORD- 10292 12633 13617 Sperry Gyroscope P.O. 95692 96424 103526 16421 101538 101541 103523	The Raytheon Mfg. Company, Waltham, Mass.	627,232.74	Amplifiers and Demodulators for the Remote Control System, M2	12/1/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Philadelphia Ordnance District:				
W-670-ORD-2165 Standard Pressed Steel Co. P.O.B-10002	Automatic Machine Products Company, Attleboro, Mass.	110,000.00	Bodies, Primer, Percussion, M1B1A2	9/42
Inspection requisitioned by Picatinny Arsenal:				
W-672-ORD-				
5249	Lonsdale Company, Providence, Rhode Island	124,722.00	Cloth, Cartridge, Cotton, Grade A	8/24/42
5251	Glenlyon Print Works, Phillipsdale, Rhode Island	652,525.00	Cloth, Cartridge, Cotton, Grade C	7/18/42
5657	American Bleached Goods Company, Inc. Saylesville, Rhode Island	735,909.86	Cloth, Cotton, Cartridge, Grade C	12/42
5701	Whitehead Metal Products Company, Inc., Cambridge, Massachusetts	800,000.00	Metal Liner for Box, Packing for cluster fragmentation bomb	8/42
5765	National Silver Company, Taunton, Massachusetts	154,440.00	Supports, steel, for AN-M103 Nose Bomb Fuze, Packing Container	3/1/45
Inspection requisitioned by Pittsburgh Ordnance District:				
W-761-ORD-				
2052 Kelly Tire P.O. 66382	Revere Copper & Springfield Brass Company, New Bedford, Massachusetts	145,420.00	Rotating Bands for Shell, 8" H.E., M106	9/1/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Rock Island Arsenal:				
W-741-ORD-				
6660	Firestone Steel Products Company, Fall River, Mass.	4,665,898.50	Metallic Belt Links, Cal. .50 M2	6/43
Inspection requisitioned by Springfield Armory:				
W-852-ORD-				
9963	Hadley Special Tool Company, Boston, Mass.	131,524.24	Headspace and Timing Gages, Cal. .30 and Cal. .50 B.M.G. M2 AC	3/31/42
10064	Stevens Walden, Inc. Worcester, Mass.	1,033,106.25	Holder, Cartridge, Cal. .30 B.M.G. M1919 A4	4/43
10065	Hadley Special Tool Company, Boston, Mass.	562,009.80	Adapters, Belt, Cal. .30 B.M.G. M1919 A4	3/15/43
12750	Hadley Special Tool Company, Boston, Mass.	735,859.52	Belt Adapters for Trainer, Cal. .22 M.G., M3 and M4	6/30/43
*12753	Hadley Special Tool Company, Boston, Mass.	116,101.56	Extractors, Ruptured Cartridge, Mk2, for Cal. .30 Rifle U.S. M1	7/31/42

Monthly Report, May

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Springfield Armory:				
W-852-ORD-				
*12865	Stevens Walden, Inc. Worcester, Mass.	233,956.23	Holders, Cartridge, for Trainer, Cal. .22 M.G. M3 and M4	12/42
*12890	Bay Products Corp. Boston, Mass.	280,761.67	Tools, Carbon Removing, for Cal. .30 B.M.G. N4 AC	8/2/42
*12915	Hadley Special Tool Company, Boston, Mass.	194,973.77	Gages, Headspace and Timing, Cal. .30 and Cal. .50 B.M.G. M2 AC	9/43
*P.O. 15258	Stevens Walden, Inc. Worcester, Mass.	541,921.87	Holders, Cartridge, for Trainer, Cal. 22 M.G. M3 and M4	6/43
*P.O. 16365	Bay Products Corp. Boston, Mass.	121,862.73	Tools, Carbon Removing, for Cal. .30 B.M.G. N4 AC	10/1/42
Inspection requisitioned by Watertown Arsenal:				
W-852-ORD-				
4695	Pullman Standard Car Mfg. Company, (Osgood Bradley Plant) Worcester, Mass.	178,629.00	Weldments for 90 mm., outrigger and bogie frame	5/2/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Contract or Order No.	Plant	Value	Item	Expected Completion Date
Inspection requisitioned by Watertown Arsenal:				
W-952-ORD-				
5442	Standard Machinery Company, Providence, Rhode Island	163,944.00	Clip Bearings and Thrust Bearings	8/42
5563	A. F. Robinson Boiler Works, Cambridge, Mass.	122,880.00	Weldments for 90mm., Trails	9/20/42
5626	Pullman Standard Car Mfg. Company, (Osgood Bradley Plant) Worcester, Mass.	189,450.00	Weldments for Bogie Frames and Outriggers	12/42
*5708	Lewis Shepard Sales Corp. Watertown, Mass.	106,920.00	Ammunition Trucks	5/8/43
Inspection requisitioned by Army Inspector of Ordnance, Baldwin Locomotive Works:				
British A-1916 Baldwin Loco. P.O. C-40012-666-F	S. M. Howes Company, Taunton, Mass.	176,867.00	Machine Aluminum, Alloy Cast Plates for Tank, Medium	11/1/42

*Reported upon for first time

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Total Value
$210,674,638.38

a. Number of Prime Contracts being inspected from all sources - Total 1230

1. District	247
2. Arsenal	443
3. Defense Aid	536
4. Foreign	1
5. Chief of Ordnance	2
6. Administered for H.O.D.	1

b. Number of Sub-Inspection Requisitions - (Includes all Insp.-Req. not considered as Prime Contracts) - Total 2134

1. Own District	679
2. Other Districts	1140
3. Arsenals	180
4. Other Services (Air Corps)	6
5. Defense Aid	112
6. Foreign	17

c. Total number of all Inspection Requisitions and Contracts in force (a. & b.) Total 3364

d. Number of Officers predominantly on inspection duties - 4

e. Number of Civilian Inspectors (all grades) - 564

f. Number of administrative and clerical employees predominantly on inspection work - 56

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

g. Minor Engineering Aides - 38

6. Plant Protection Inspection

a.	Plants assigned	203	
b.	Plants selected by District for survey (not assigned)	38	
c.	Recent transfers from the Navy	46	
	Total		287
d.	Assigned plants covered by report of initial survey including 46 from the Navy	249	
e.	Reports submitted on other plants (not assigned)	26	
f.	Reports in process of preparation	12	
	Total		287

thly Report, May

6. Plant Protection Inspection

g.	Total Plants Surveyed	241
	Total Plants Second Survey	148
	Total Plants Third Survey	36

J. S. CRAWFORD
Colonel, Ordnance Department
Deputy District Chief

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San Francisco Ordnance District
Los Angeles Ordnance Region

REPRODUCED AT THE NATIONAL ARCHIVES

May 7, 1941

POLICY DOC. FILE
LOG NO. 625
CLASS NO. 346.9046 C

MEMORANDUM:

TO: Mr. W. L. Batt
FOR: Mr. Wm. S. Knudsen

Co: Mr. Donald M. Nelson
Mr. E. F. Johnson

FROM: Mr. A. R. Glancy

SUBJECT: Contract clearance, dated 5 May, 1941, for loading five million rounds 20 mm. Oerlikon Tracer Shells for British. Total cost $1,488,750.

(1). The subject contract is for the National Fireworks, Inc., W. Hanover, Massachusetts, to load five million rounds of Oerlikon Tracer Shells for the British. The unit price of $0.29875 represents the cost of loading the complete round and appears fair and just.

(2). These items are for the British under the "Land-Lease" Act. Authority to negotiate this contract was given by the Secretary of the Navy, April 23, 1941.

The Chief of the Bureau of Ordnance certified on April 18, 1941, that in his opinion, if competitive bids were to be invited for this material, "the bids which would be submitted would not represent the operation of effective competition, and furthermore, that to invite competitive bids would seriously impair, impede, and delay the acquisition of this material."

The Chief of the Bureau of Ordnance also has certified that, in his opinion, the estimated prices which it is expected will be paid for this material are "fair and reasonable, having due regard to the cost of production of the same or comparable items in efficient, privately-owned plants, operating at a rate of capacity equal to that at which the proposed contractor's facilities will be operated during the period of performance of the contract."

A. R. Glancy
Chief, Ordnance Section.

Prepared by A. S. Wotherspoon.

10902490

REPRODUCED AT THE NATIONAL ARCHIVES

May 7, 1941

POLICY DOC. FILE
LOG NO. 625
CLASS NO.
346.9046
C

MEMORANDUM:

TO: Mr. W. L. Batt
FOR: Mr. Wm. S. Knudsen

Cc: Mr. Donald M. Nelson
Mr. E. F. Johnson

FROM: Mr. A. R. Glancy

SUBJECT: Contract clearance, dated 6 May, 1941, for loading five million rounds 20 mm. Oerlikon Tracer Shells for British. Total cost $1,668,750.

(1). The subject contract is for the National Fireworks, Inc., W. Hanover, Massachusetts, to load five million rounds of Oerlikon Tracer Shells for the British. The unit price of $0.29875 represents the cost of loading the complete round and appears fair and just.

(2). These items are for the British under the "Lend-Lease" Act. Authority to negotiate this contract was given by the Secretary of the Navy, April 23, 1941.

The Chief of the Bureau of Ordnance certified on April 15, 1941, that in his opinion, if competitive bids were to be invited for this material, "the bids which would be submitted would not represent the operation of effective competition and furthermore, that to invite competitive bids would seriously impair, impede, and delay the acquisition of this material."

The Chief of the Bureau of Ordnance also has certified that, in his opinion, the estimated prices which it is expected will be paid for this material are "fair and reasonable, having due regard to the cost of production of the same or comparable items in efficient, privately-owned plants, operating at a rate of capacity equal to that at which the proposed contractor's facilities will be operated during the period of performance of the contract."

A. R. Glancy
Chief, Ordnance Section.

Prepared by A. S. Wotherspoon.

ALL COMMU[illegible]IONS SHOULD BE ACCOMPANIED BY CARBON COPY AN[illegible]DRESSED TO

ERS/mlg/ob

WAR DEPARTMENT

BOSTON ORDNANCE DISTRICT

ROOM 1501, 140 FEDERAL STREET

BOSTON, MASS.

IN REPLY REFER TO

B.O.D. No. 319.1/280 - Activities

October 27, 1941

Subject: Monthly Report of Activities - October

To: Chief of Ordnance
Washington, D. C.

ATTN: Industrial Service, District Control Division

1. Personnel

1. Military Personnel

a. No. of officers on duty:

Regular Army	-	1
Reserve Officers	-	29

b. No. of Reserve Officers authorized - 48

c. No. of Reserve Officers for whom active duty orders have been requested - 2

d. New officers who reported for active duty - 0

2. Civilian Personnel

Civilian personnel on duty as of October 25, 1941:

a. Custodial

CU-1	5	
CU-2	1	
CU-4	1	
		7

b. Clerical and Administrative

CAF-1	109	
CAF-2	22	
CAF-3	11	
CAF-4	11	
CAF-5	7	
CAF-6	1	
CAF-7	2	
CAF-8	1	
		164

2. Civilian Personnel (continued)

c. Accountants

CAF-7	4	
CAF-9	1	
		5

d. Inspectors

CAF-1	68	
CAF-2	64	
CAF-3	40	
CAF-4	37	
CAF-5	32	
CAF-6	14	
CAF-7	2	
		257

e. Sub-Professional

SP-1	1	
SP-2	1	
SP-3	8	
SP-4	1	
		11

f. Professional

P-1	10	
P-2	5	
P-3	4	
P-4	11	
P-5	2	
		32

g. Plant Protection

CAF-8	1	
CAF-9	2	
CAF-11	3	
		6
	TOTAL	482

2. Surveys

a.	Number of new surveys	-	38
b.	Number of plants visited for procurement planning purposes	-	30

3. Miscellaneous

October 7 - Lt. Donald B. Robinson, O.U.S.W., visited the District office in connection with drawing up plans for a Washington delegation to visit industrial facilities in the District area on October 30.

October 18 - The Executive Officer spoke to a group of students enrolled in the course of Industrial Management at Massachusetts Institute of Technology, and at that time arranged for student visits to various industrial facilities in this District during the school year for the purpose of studying the difficulties of procurement in this district and the eastern section of the United States.

October 23 - The Executive Officer accompanied Brigadier General Earl McFarland while in attendance at the Defense Conference of the Associated Industries of Massachusetts held at the Copley Plaza Hotel, and at which General McFarland was guest speaker. In connection with this conference, the Boston Ordnance District office furnished a display of Ordnance material.

October 24 - Major Philip E. Gruber visited the Hartford Ordnance District office in regard to general administrative and personnel matters and current district activities.

The following engineering committee meetings, arranged by the Chief of Ordnance, were held during the past month:

Committee:	Artillery Fuze (Dayton, Ohio)
Date:	September 29, 1941
Office Representative:	Harry R. O. MacNevin, Government Inspector
Committee:	Rifled-Bore Shell (Chicago)
Date:	October 10, 1941
Office Representatives:	Lt. Colonel J. S. Crawford
	Major L. E. Briggs
Committee:	Bar-Stock Shell
Date:	October 16, 1941
Office Representative:	Major L. E. Briggs
Company Invited:	Framanco Company
Committee:	37 mm. A. P. Shot (Dover, New Jersey)
Date:	October 21, 1941
Office Representative:	Kenneth L. Rodgers, Government engineer

During period covered by current report, there were 1,293 visitors to the District office.

There were 7,319 pieces of incoming and 12,964 pieces of outgoing mail during period covered by current report.

4. a. Educational Orders

W-ORD-363 C. H. Cowdrey Machine Works
Fitchburg, Massachusetts

75 mm. Pack Howitzer, M1A1

This Educational Order Contract showed very little progress during the past month. As previously reported, the diameter of the straight section of the tubes to the rear of the forcing cone was bored to a size exceeding the maximum tolerance. Discussions have taken place between the contractor and Watervliet Arsenal relative to the possibility of restoring the tubes to a useful condition or to the granting of permission by the Arsenal for the tubes to be accepted despite their oversized bore. The contractor informs us that Major Hammersley of Watervliet Arsenal will visit his plant within the next two weeks to pass judgment upon this matter.

The smaller components of the Pack Howitzer are completed with the exception of Heat Treating. A representative of the Cowdrey Machine Works is now visiting Watervliet Arsenal for training along this line. Upon his return to Fitchburg, he will take charge of the operation.

Some delay was also experienced on manufacture of the Breech Rings. However, no unusual difficulties appear to exist on production of this component and it should be ready for assembly before the tubes are completed.

	Appropriated	Disbursed
Pack Howitzer	$ 66,540.00	$15,856.17
Mfg. Equipment	109,680.25	94,900.44
	$176,220.25	$110,756.61

W-ORD-395 Harrington & Richardson Arms Co.
Worcester, Massachusetts

Pistol, Automatic, Caliber .45, M1911A1

Work is progressing rather slowly on this Educational Order due primarily to internal management difficulties at this plant and preparation for production of pistols on new contracts. Out of approximately 245 manufacturing operations to be performed by the company on the Colt Automatic Pistol, 75 have been completed to date. The following indicates the present status of work on this contract: Gages - 58%; Fixtures - 65%; Punches and Dies - 30%; and Machine Tools - 56%. No appreciable progress has yet been made on the Production Analysis.

4. Educational Orders (continued)

W-ORD-395 (continued)

Appropriated		Disbursed
Pistols	$ 15,545.00	$ 3,125.26
Mfg. Equipment	182,257.35	105,294.55
	$197,802.35	$108,419.81

W-ORD-411 Builders Iron Foundry
Providence, Rhode Island

Mount, Telescope, M15A1

Assembly and inspection of Telescope Mounts on this Educational Order contract progressed rapidly during the past month. To date, twenty-two of them have been accepted by the Inspector of Ordnance at this plant and shipped to Frankford Arsenal. Further progress was also made on the Production Analysis.

Appropriated		Disbursed
Mount, Telescope	$13,784.22	None
Mfg. Equipment	91,435.07	$66,407.95
	$105,219.29	$66,407.95

W-ORD-425 Waltham Watch Co.
Waltham, Massachusetts

Fuze, Mechanical Time, M43A1

Manufacture of all components for the fuze is progressing satisfactorily. It is expected that the first fuze will be completed during the coming month. The Jumble and Jolt machines have been installed, and the pipe for making the drop test has been set up. A loading room has been established and is ready for use. All machine operations on parts which were being manufactured on the Brown & Sharpe screw machines have been completed and two of these machines are now on production for components for Frankford Arsenal on its Purchase Order 42-858.

As other parts of the Educational Order fuze are completed, additional machines, such as the four spindle Gridley Automatic Screw Machine, will be assigned to work on the M-58, B. D. Fuze.

Appropriated		Disbursed
Fuze	$127,284.40	None
Mfg. Equipment	254,060.00	$215,008.51
	$381,344.40	$215,008.51

4. Educational Orders (continued)

W-ORD-451 Albert & J. M. Anderson Mfg. Co.
Boston, Massachusetts

Case, Cartridge 3" A. A., MkIIM2

Further progress was made during the past month on Item 6, Production Analysis, of this Educational Order Contract. All other items on this contract have been accepted. It is expected that the above-mentioned production study will be finished within the coming month.

	Appropriated	Disbursed
Cart. Cases	$90,000.00	$10,430.52
Mfg. Equipment	26,040.00	4,308.00
	$116,040.00	$14,738.52

Production Study Contracts

Five Production Studies have been completed as indicated in Monthly Report for June. No further action has been taken.

5. Current Procurement

(1) Contract Negotiation

STATUS OF DISTRICT CONTRACTS NOT YET APPROVED FOR FINAL DISTRIBUTION

The following Letter Contracts are being prepared in this office for execution by the contractors:

a. Contract DA W 241 ORD-90 - Bryant Chucking Grinder Co.
b. Contract DA W 241 ORD-91 - Brown & Sharpe
c. Contract DA W 241 ORD-94 - Bryant Chucking Grinder Co.
d. Contract DA W 241 ORD-95 - Heald Machine Company
e. Contract DA W 241 ORD-107 - Reed-Prentice
f. Contract DA W 241 ORD-110 - National Fireworks, Inc.
g. Contract W 241 ORD-343 - Harrington & Richardson Arms Co.
h. Contract W 241 ORD-346 - Harrington & Richardson Arms Co.

5. Current Procurement (continued)

(1) Contract Negotiation (continued)

Supplemental Agreements No. 1 (formal contracts) are being prepared on the following contracts:

a. Contract W 241 ORD-334 - Waltham Watch Co.
b. Contract W 241 ORD-344 - Cohn & Rosenberger Company
c. Contract DA W 241 ORD-5 - National Fireworks, Inc.
d. Contract DA W 241 ORD-32 - Fellows Gear Shaper Co.
e. Contract DA W 241 ORD-41 - LaPointe Machine Tool Co.
f. Contract DA W 241 ORD-42 - Waltham Machine Tool Co.
g. Contract DA W 241 ORD-46 - Heald Machine Company
h. Contract DA W 241 ORD-56 - Fellows Gear Shaper Company
i. Contract DA W 241 ORD-62 - Estey Organ Corporation
j. Contract DA W 241 ORD-66 - Fitchburg Grinding Machine Co.
k. Contract DA W 241 ORD-67 - Fellows Gear Shaper Co.
l. Contract DA W 241 ORD-68 - Builders Iron Foundry Company
m. Contract DA W 241 ORD-69 - Reed-Prentice Corporation
n. Contract DA W 241 ORD-73 - Florence Stove Company
o. Contract DA W 241 ORD-74 - Estey Organ Company
p. Contract DA W 241 ORD-77 - Brown & Sharpe
q. Contract DA W 241 ORD-102 - Beckwith Mfg. Co.
r. Contract DA W 241 ORD-105 - National Fireworks, Inc.

The following Supplemental Agreements No. 1 (formal contracts) have been forwarded to the contractors for execution:

a. Contract W 241 ORD-335 - Kingsbury Machine Tool Co.
b. Contract W 241 ORD-337 - Chaffee Brothers
c. Contract W 241 ORD-345 - General Electric Company
d. Contract DA W 241 ORD-11 - Bryant Chucking Grinder Co.
e. Contract DA W 241 ORD-26 - Blanchard Machine Co.
f. Contract DA W 241 ORD-58 - Rivett Lathe & Grinder Co.
g. Contract DA W 241 ORD-61 - Revere Copper & Brass
h. Contract DA W 241 ORD-71 - Blanchard Machine Company
i. Contract DA W 241 ORD-75 - Jones & Lamson
j. Contract DA W 241 ORD-76 - Cone Automatic Machine Company

The following Supplemental Agreements No. 1 (formal contracts) have been executed by the contractor:

a. Contract W 241 ORD-339 - Standard Machinery Co.
b. Contract DA W 241 ORD-6 - Harrington & Richardson Arms Co.
c. Contract DA W 241 ORD-15 - Norton Company
d. Contract DA W 241 ORD-20 - The Heald Machine Co.
e. Contract DA W 241 ORD-28 - Norton Company

5. Current Procurement (continued)

(1) Contract Negotiation (continued)

f. Contract DA W 241 ORD-29 - Heald Machine Co.
g. Contract DA W 241 ORD-31 - Reed-Prentice Corporation
h. Contract DA W 241 ORD-38 - Reed-Prentice Corporation
i. Contract DA W 241 ORD-39 - Norton Company
j. Contract DA W 241 ORD-43 - Potter & Johnston Machine Co.
k. Contract DA W 241 ORD-49 - Reed-Prentice Corporation
l. Contract DA W 241 ORD-50 - The Heald Machine Company
m. Contract DA W 241 ORD-53 - B. C. Ames
n. Contract DA W 241 ORD-59 - Heald Machine Company
o. Contract DA W 241 ORD-60 - Heald Machine Company
p. Contract DA W 241 ORD-64 - Brown & Sharpe
q. Contract DA W 241 ORD-65 - Brown & Sharpe
r. Contract DA W 241 ORD-70 - Norton Company
s. Contract DA W 241 ORD-79 - Norton Company

The following Supplemental Agreements No. 1 (formal contracts) have been forwarded to Washington for approval:

a. Contract W 241 ORD-327 - Cone Automatic Machine Co.
b. Contract W 241 ORD-328 - The Framanco Company
c. Contract W 241 ORD-332 - Automatic Machine Products Co.
d. Contract DA W 241 ORD-7 - Arter Grinding Machine Co.
e. Contract DA W 241 ORD-9 - Rivett Lathe & Grinder Co.
f. Contract DA W 241 ORD-12 - Blanchard Machine Corp.
g. Contract DA W 241 ORD-13 - LaPointe Machine Tool Co.
h. Contract DA W 241 ORD-14 - Reed-Prentice Corporation
i. Contract DA W 241 ORD-17 - B. C. Ames Co.
j. Contract DA W 241 ORD-18 - Stark Tool Co.
k. Contract DA W 241 ORD-19 - Stevens Walden Co.
l. Contract DA W 241 ORD-21 - Potter & Johnston Machine Co.
m. Contract DA W 241 ORD-22 - Fellows Gear Shaper Co.
n. Contract DA W 241 ORD-25 - Potter & Johnston Machine Co.
o. Contract DA W 241 ORD-27 - Reid Brothers Co.
p. Contract DA W 241 ORD-30 - Reed-Prentice Corp.
q. Contract DA W 241 ORD-35 - Brown & Sharpe
r. Contract DA W 241 ORD-48 - Excel Foundry Company

The following formal contracts are being prepared in this office:

a. Contract W 241 ORD-348 - National Fireworks, Inc.
b. Contract W 241 ORD-352 - United Shoe Machinery Co.
c. Contract DA W 241 ORD-57 - Bryant Chucking Grinder Co.
d. Contract DA W 241 ORD-86 - Florence Stove Company
e. Contract DA W 241 ORD-92 - Brown & Sharpe

5. Current Procurement (continued)

(1) Contract Negotiation (continued)

f. Contract DA W 241 ORD-99 - Blanchard Machine Tool Co.
g. Contract DA W 241 ORD-101 - LaPointe Machine Tool Co.
h. Contract DA W 241 ORD-106 - Norton Company
i. Contract DA W 241 ORD-108 - Cone Automatic Co.
j. Contract DA W 241 ORD-109 - T. R. Almond Mfg. Co.
k. Contract DA W 241 ORD-111 - Brown & Sharpe
l. Contract DA W 241 ORD-112 - Bryant Chucking Grinder Co.
m. Contract DA W 241 ORD-113 - Rolled Thread Die Co.
n. Contract DA W 241 ORD-114 - Builders Iron Foundry
o. Contract DA W 241 ORD-115 - W. D. Clement Lathe Works
p. Contract DA W 241 ORD-116 - Brown & Sharpe
q. Contract DA W 241 ORD-117 - Brown & Sharpe
r. Contract DA W 241 ORD-118 - Washburn Shops
s. Contract DA W 241 ORD-119 - B. C. Ames Co.
t. Contract DA W 241 ORD-120 - Cone Automatic Machine Co.
u. Contract DA W 241 ORD-121 - Stark Tool Co.

7. The following formal contracts have been forwarded to the contractor for execution:

a. Contract DA W 241 ORD-81 - Arter Grinding Co.
b. Contract DA W 241 ORD-89 - Brown & Sharpe
c. Contract DA W 241 ORD-96 - Rivett Lathe & Grinder Co.
d. Contract DA W 241 ORD-98 - Brown & Sharpe
e. Contract DA W 241 ORD-100 - Rhodes Mfg. Co.
f. Contract DA W 241 ORD-104 - Leland-Gifford Co.

8. The following formal contracts have been executed by the contractors:

a. Contract DA W 241 ORD-80 - Abrasive Machine Tools
b. Contract DA W 241 ORD-82 - Reid Brothers Co.
c. Contract DA W 241 ORD-84 - Norton Company
d. Contract DA W 241 ORD-93 - Norton Company
e. Contract DA W 241 ORD-97 - Rotler Boring Bar Co., Inc.

9. The following contracts (formal) have been forwarded to Washington for approval:

a. Contract W 241 ORD 332 - Automatic Machine Products Co.

10. The following contracts have been distributed:

a. Contract W 241 ORD-347 - Welsh Manufacturing Co.
b. Contract DA W 241 ORD-8 - A. S. Campbell Co., Inc.

5. Current Procurement (continued)

(1) Contract Negotiation (continued)

c. Contract DA W 241 ORD-16 - Abrasive Machine Tool Co.
d. Contract DA W 241 ORD-24 - Automatic Machine Products Co.
e. Contract DA W 241 ORD-33 - Builders Iron Foundry
f. Contract DA W 241 ORD-34 - Standard Machinery Company
g. Contract DA W 241 ORD-37 - La Pointe Machine Tool Co.
h. Contract DA W 241 ORD-44 - La Pointe Machine Tool Co.
i. Contract DA W 241 ORD-51 - Abrasive Machine Tool Co.
j. Contract DA W 241 ORD-72 - Sleeper & Hartley, Inc.
k. Contract DA W 241 ORD-83 - J. T. Slocomb
l. Contract DA W 241 ORD-85 - Reed-Prentice Corporation
m. Contract DA W 241 ORD-87 - Fay & Scott
n. Contract DA W 241 ORD-88 - Chadwick & Trefethen
o. Contract DA W 241 ORD-103 - Brown & Sharpe

(2) Miscellaneous Current Procurement Activities

STATUS OF NEGOTIATION ON ALL CURRENT PROCUREMENT

Prices have been submitted on the following items:

AMMUNITION

Date	Item	Company	Amount
9/30	Shot, Semi-A.P., 75 mm., M72	S. A. Woods Mach. Co. (Rev.)	500,000
		H. & B. Amer. Mach. Co. (Rev.)	500,000
10/9		S. A. Woods Mach. Co. (Rev.)	400,000
10/10		S. A. Woods Mach. Co. (Rev.)	400,000
10/10	Load., Assemb., and Pack. Fuze, Perc. DA No. 152, Mark I/L, for 3" Trench Mortar Bomb.	National Fireworks, Inc.	500,000
		National Fireworks, Inc.	1,000,000
		National Fireworks, Inc.	1,500,000
		National Fireworks, Inc. (Cond.)	500,000
		National Fireworks, Inc. (Cond.)	1,000,000
		National Fireworks, Inc. (Cond.)	1,500,000
10/10	Detonator #432 for Fuze #152 for 3-inch Trench Mortar Bomb.	National Fireworks, Inc.	500,000
		National Fireworks, Inc.	1,000,000
		National Fireworks, Inc.	1,500,000
10/10	Load., Assemb., and Pack. of 3" Trench Mortar Complete Round	National Fireworks, Inc.	500,000
		National Fireworks, Inc.	1,000,000
		National Fireworks, Inc.	1,500,000

5. Current Procurement (Continued)

(2) Miscellaneous Current Procurement Activities (continued)

Date	Item	Company	Amount
10/9	Sets of Metal Parts for Detonator, Pc. Mk. 73-1-162C	T. W. Foster & Bros. Co., Inc.	5,000,000
		Prov. Base Wks. of Gen. Elec. Co.	10,000,000
		Guyot Brothers, Inc.	10,000,000
		Freeman-Daughaday Co.	10,000,000
10/10		Blake Mfg. Corp.	10,000,000
		American Metal Crafts Co.	10,000,000
		Machine Products Co., Inc.	10,000,000
10/17		O. R. Johnson Co.	10,000,000
10/8	Sets of Metal Parts for Relay, Pc. Mk.73-2-144A	Ripley & Gowen Co., Inc.	14,500,000
		H. T. Wilmarth Co.	14,500,000
10/9		T. W. Foster & Bros. Co., Inc.	7,250,000
		Prov. Base Wks. of Gen. Elec. Co.	14,500,000
		Guyot Bros. Co., Inc.	14,500,000
		Freeman-Daughaday Co.	14,500,000
10/10		Blake Mfg. Corp.	14,500,000
		American Metal Crafts Co.	14,500,000
		B. A. Ballou & Company, Inc.	14,500,000
		United Carr Fastener Corp.	14,500,000
		Machine Products Co., Inc.	14,500,000
10/11		O. R. Johnson Co.	14,500,000
10/9	Sets of Metal Parts for Detonator, Pc. Mk. 73-2-162A	T. W. Foster & Bro. Co., Inc.	4,500,000
		Prov. Base Works of Gen. Elec. Co.	9,000,000
		Guyot Bros. Co., Inc.	9,000,000
		Freeman-Daughaday Co.	9,000,000
10/10		Blake Mfg. Corp.	9,000,000
		American Metal Crafts Company	9,000,000
		Machine Products Co., Inc.	9,000,000
10/9	Sets of Metal Parts for Detonator, Pc. Mk. 82-3-282A	Prov. Base Works of Gen. Elec. Co.	1,850,000
		Guyot Bros. Co., Inc.	1,850,000
		Freeman-Daughaday Co.	1,850,000
10/10		Blake Mfg. Corp.	1,850,000
		American Metal Crafts Co.	1,850,000
		Machine Products Co., Inc.	1,850,000
10/8	Sets of Metal Parts for Relay, Pc. Mk.73-1-167D	Ripley & Gowen Co., Inc.	900,000
10/9		Guyot Bros. Co., Inc.	900,000
		Freeman-Daughaday Co.	900,000

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Date	Item	Company	Amount
10/10	Sets of Metal Parts for Relay, Pc. Mk.73-1-167D	Blake Mfg. Company	900,000
		American Metal Crafts Co.	900,000
		Fulford Mfg. Co.	900,000
		Superior Products Mfg. Co.	900,000
		Machine Products Co., Inc.	900,000
10/11		United Shoe Machinery Corp.	900,000
10/17		O. R. Johnson Co.	900,000
10/11	Plug, Nose, Closing, for 90 mm., M58 Shell	Wright Machine Co.	190,000
10/15		Sullivan Machinery Company	190,000
		Heywood-Wakefield Company	190,000
		General Fittings Corp.	190,000
		Parker & Harper Mfg. Co.	190,000

Bids are currently being requested on the following items:

AMMUNITION

	Shot, Semi-A.P., 37 mm., M74
297,000	Arming, Wire Assemblies for 100 lb., M30, Demo. Bomb.
75,500	Arming, Wire Assemblies for 500 lb., M43, Demo. Bomb
5,500	Arming, Wire Assemblies for 30 lb., M5 Frag. Bomb
28,000	Arming, Wire Assemblies for 100 lb., M47, Chemical Bomb
95,500	Arming, Wire Assemblies for 1,000 lb. M44, Demo. Bomb
79,500	Arming, Wire Assemblies for 30 lb., M46, Chemical Bomb
79,000	Arming, Wire Assemblies for 20 lb., M48, Practice Bomb
31,500	Arming, Wire Assemblies for 2,000 lb., M34, Demo. Bomb
14,000,000	Sq. Yds. Silk, Parachute, Pyrotechnics
300,000	Loading, Assembling and Packing of 5.5" Shells, with 60/40 Amatol including Procurement and Loading of Exploder Shell and Smoke Box.
325,000	Loading, Assembling and Packing of 7.2" Howitzer Shells, Mark ID, with 60/40 Amatol, including Procurement and Loading of Exploder Shell.

SMALL ARMS

200,336	Scabbards, Bayonet, M3
400,336	Scabbards, Bayonet, M3

ARTILLERY

300,000	Medium Tank Track Bodies

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

MACHINE TOOLS - DEFENSE AID

Prices have been submitted to Washington to cover the following U. K. Requisitions:

Company	U. K. Requisition No.
Arter Grinding Machine Co.	4080, 4121
Edward Blake Co.	3962, 3734
The Blanchard Machine Co.	5097
Brown & Sharpe Mfg. Co.	4503, 4498, 5099, 5039, 4656, 4671
Bryant Chucking Grinder Co.	3899, 4243, 4650
The Fellows Gear Shaper Co.	4148
Henry L. Hanson	3674, 4010
The Heald Machine Co.	3875, 4110, 4111, 4470
Jones & Lamson Machine Co.	3474, 3545, 5054
Morse Twist Drill & Machine Co.	3970
Norton Co.	4157, 4450, 5055, 5108
Potter & Johnston Machine Co.	3905
Reed-Prentice Corp.	3274, 3699, 4097, 4883A, 5129 5057
Reid Bros. Co., Inc.	5155
Rivett Lathe & Grinder, Inc.	2819, 3121, 5053, 5093, 4593
Sleeper & Hartley	4575
Stark Tool Co.	4155
The L. S. Starrett Co.	5061
The Taft-Peirce Mfg. Co.	1717, 5070

Acceptance has not as yet been secured on Letters of Contract which have been received to cover the following U. K. Requisitions:

Brown & Sharpe Mfg. Co.	3555, 3442, 3438
The Heald Machine Co.	3319, 3343, 3344
Jones & Lamson Machine Co.	1193

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

MACHINE TOOLS - DEFENSE AID (continued)

Request to proceed with the preparation and execution of the formal contract covering the approved award has been received to cover the following U. K. Requisitions:

Company	U. K. Requisition No.
T. R. Almond Mfg. Co.	3440
B. C. Ames Co.	4301,5059
Arter Grinding Machine Co.	1395
The Blanchard Machine Co.	3629
Brown & Sharpe Mfg. Co.	3485, 3534, 3628, 3582, 4240 4149, 4439, 4505, 4298, 4320 4327, 5002, 3881, 2668, 3000 2441
Bryant Chucking Grinder Co.	1233, 2331, 3317, 3618
Builders Iron Foundry	3847
W. D. Clement Lathe Works	1859
Cone Automatic Machine Co.	3521, 3590, 4210, 4541, 4367
The Heald Machine Co.	2498, 1780A3
Jones & Lamson Machine Co.	1742, 3051
The Lapointe Machine Tool Co.	3589, 3626
Leland-Gifford Co.	3671
Norton Co.	3769
Reed-Prentice Corp.	1770A2
Rhodes Mfg. Co.	3562
Rolled Thread Die Co.	3983
The Washburn Shops	4695

Reports of acceptance of Letters of Contract have been teletyped to Washington to cover the following U. K. Requisitions:

Bryant Chucking Grinder Co.	716
Builders Iron Foundry	2459
The Fellows Gear Shaper Co.	2923
Fitchburg Grinding Machine Corp.	2981
The Heald Machine Co.	963, 998, 1000, 1153, 1300 1971, 2065, 1780, 3166

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

MACHINE TOOLS - DEFENSE AID (continued)

Company	U. K. Requisition No.
Rivett Lathe & Grinder, Inc.	1034
Waltham Machine Works	1407

Field Service Reports have been sent to Washington to cover the following U. K. Requisitions:

Abrasive Machine Tool Co.	1595, 3342
B. C. Ames Co.	254, 1390
Arter Grinding Machine Co.	717
The Blanchard Machine Co.	215, 1021, 3143
Brown & Sharpe Mfg. Co.	551, 761, 851, 997, 1175, 730, 917, 1659, 1322, 1450, 1993, 1314, 3086, 3058, 3243, 3364, 3647, 3751, 3767, 3840
Builders Iron Foundry	908
Chadwick & Trefethen	3383
Circular Tool Co.	2198
The Fellows Gear Shaper Co.	1028, 2230
Fitchburg Grinding Machine Corp.	913, 1707
The Heald Machine Co.	234, 433, 556, 876
The Lapointe Machine Tool Co.	1196, 1662, 2063, 2337, 2597
Norton Co.	267, 1030, 1305, 2003, 2455
Potter & Johnston Machine Co.	764
Reed-Prentice Corp.	1998, 2283, 2499, 3157
Reid Bros. Co., Inc.	1105, 3169
Rivett Lathe & Grinder, Inc.	181, 184, 214, 511, 756
Sleeper & Hartley	3116
J. T. Slocomb Co.	3384
Stark Tool Co.	434
Stevens Walden, Inc.	2022, 2159
The Van Keuren Co.	2667

Information for release of material has been received to cover the following U. K. Requisitions:

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

MACHINE TOOLS - DEFENSE AID (continued)

Company	U. K. Requisition No.
Abrasive Machine Tool Co.	1669
Brown & Sharpe Mfg. Co.	466, 911, 295, 624
Cone Automatic Machine Co.	3154
The Fellows Gear Shaper Co.	187
The Heald Machine Co.	220, 238, 253, 472, 675
The Lapointe Machine Tool Co.	435, 686
Norton Co.	241, 296, 729, 841, 457 1841, 4330
Potter & Johnston Machine Co.	411, 1401, 1521, 411A
Reed-Prentice Corp.	1025, 1661, 2335, 1770, 2669
Standard Machinery Co.	646

Shipment has been made on material covered by the following U. K. Requisitions:

Abrasive Machine Tool Co.	1383, 691 (part)
The Heald Machine Co.	840 (part)
Langelier Mfg. Co.	2000
Norton Co.	874
Potter & Johnston Machine Co.	351 (part)
Reed-Prentice Corp.	867, 868, (part), 989 (part)
Stevens Walden, Inc.	478 (part)

Quotations will be submitted shortly to cover the following U. K. Requisitions:

Brown & Sharpe Mfg. Co.	3047A, 5102, 5022, 4599
Fay & Scott	4310
The Fellows Gear Shaper Co.	4592
The Heald Machine Co.	4370, 4542, 5056
Jones & Lamson Machine Co.	4539
Norton Co.	3685, 5080, 5028
Reed-Prentice Corp.	3855, 4691
The Taft-Peirce Mfg. Co.	5110

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Surface Grinders	Abrasive Mach. Tool Co.	DA-W-241-ORD-16	Boston Ordnance District	$ 125,050.00	12/31/41 Completed
Guanadine Nitrate	American Cyanamid & Chemical Corp.	DA-W-613-ORD 4	New York Ordnance District	640,000.00	
Case, Cartridge, 3", A.A., MK 2, M2,	Albert & J.M. Anderson Mfg. Co.	W-241-ORD-304	Boston Ordnance District	1,623,930.00	7/1/42
Primer Bodies for Primer, Percussion, M1B1A1	Automatic Mach. Products Co.	W-672-ORD-3476	Picatinny	591,294.00	2/5/42
Primer, Percussion, M1B1A1 (Metal Parts)	Automatic Mach. Products Co.	DA-W-241-ORD-24	Boston Ordnance District	108,000.00	5/42
Primer, Percussion, M1B1A1 (Metal Parts)	Automatic Mach. Products Co.	W-241-ORD 332	Boston Ordnance District	621,756.00	5/42
Helmet Linings (Group Assemblies)	Bates Shoe Co.	W-741-ORD-7275	Rock Island	705,350.96	11/21/41
Helmet Linings (Group Assemblies)	Bates Shoe Co.	W-741-ORD-9150	Rock Island	278,800.00	12/31/41
Emergency Plant Facility	John Bath & Co., Inc.	W-241-ORD-307	Boston Ordnance District	775,000.00	

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Tools, Carbon Removing	Bay Products Corporation	W-852-ORD-9960	Springfield	$ 219,002.41	3/23/42
Bayonet Scabbard, M3	Beckwith Mfg. Co.	W-241-ORD-350 DA-W-241-ORD-102	Boston Ordnance District	750,000.00	11/30/42
Machine Tools	Brown & Sharpe Mfg. Co.	DA-W-241-ORD-35	Boston Ordnance District	719,325.00	3/42
Hole Grinders	Bryant Chucking Co.	DA-W-241-ORD-11	Boston Ordnance District	116,669.50	3/31/42
Emergency Plant Facility	Bryant Chucking Co.	W-241-ORD-320	Boston Ordnance District	1,088,650.00	—
Drilling Machines	Builders Iron Foundry	DA-W-241-ORD-68	Boston Ordnance District	105,367.50	1/42
Mount, Telescope, M15A1	Builders Iron Foundry	*W-ORD-411	Chief of Ordnance	105,509.94	Completed
Mount, Telescope, M23	Builders Iron Foundry	W-314-ORD-9439	Frankford	436,830.60	12/31/42
Primer, Percussion, M23A1 (Metal Parts)	Cambridge Screw Co.	W-241-ORD-331	Boston Ordnance District	270,987.50	3/42
Case, Cartridge, 20 mm. M21 Hispano Gun/A	A. S. Campbell Co., Inc.	DA-W-241-ORD-8	Boston Ordnance District	1,864,000.00	4/42
Fuze, B. D., M58 (Metal Parts)	Cohn & Rosenberger Co.	W-241-ORD-344	Boston Ordnance District	220,000.00	10/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Auto. Screw Machines	Cone Auto. Machine Co., Inc.	W-241-ORD-327	Boston Ordnance District	$2,640,000.00	
Howitzer, Pack, 75 mm. M1A1	C. H. Cowdrey Machine Works	W-ORD-363	Chief of Ordnance	174,208.50	
Gun, 75 mm. M2	C. H. Cowdrey Machine Works	W-953-ORD-1140	Watervliet	3,566,800.00	11/42
Mounts, Telescope, M24	Cummings Mach. Works	DA-W314-ORD-122	Frankford	331,039.00	1/21/43
Wooden Boxes for 20 mm. H5 Gun, Ammunition	Estey Organ Corp.	DA-W-241-ORD-62	Boston Ordnance District	115,625.37	5/5/42
Fuze, DA & Percussion, No. 119 MK IV/L & Exploder Shell "B" MK VI Loading	Excel Foundry & Machine Co.	DA-W241-ORD-48	Boston Ordnance District	2,494,000.00	
Metallic Belt Links, Cal. 50 M1	Firestone Steel Prod. Co.	W-741-ORD-6660	Rock Island	4,665,898.50	6/43 ~~10/31/42~~
Universal Grinders	Fitchburg Grinding Mach. Co.	DA-W241-ORD 66	Boston Ordnance District	109,620.00	3/21/42
Boxes and Containers for 2 Pounder Ammunition	Florence Stove Co.	DA-W241-ORD-86	Boston Ordnance District	536,250.00	4/42
Shell, 20mm. H.E. (Machining)	Framanco Co.	W-241-ORD-328	Boston Ordnance District	545,670.00	5/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Cartridge Cloth, Cotton Grade C	Glenlyon Print Works	W-672-ORD-4521	Picatinny	$ 605,590.00	2/25/42
Parts for Fuze, B.D., M58	H & H Screw Products Mfg. Co.	W-241-ORD-344-Cohn & Rosenberger PO 23125	Boston Ordnance District	126,400.00	8/11/42
Headspace and Timing Gages	Hadley Special Tool Co.	W-852-ORD-9963	Springfield	~~129,490.36~~ 131,524.24	3/31/42
Adapters, Belt	Hadley Special Tool Co.	W-852-ORD-10065	Springfield	562,009.80	3/15/43
Pistol, Auto. Cal. .45, M1911 A1	Harrington & Richardson Arms Co.	*W-ORD-395	Chief of Ordnance	197,802.35	12/15/41
Pistol, Auto. Cal. .45, M1911A1	Harrington & Richardson Arms Co.	DA-W241-ORD-6	Boston Ordnance District	2,402,982.28	12/42
Grinding Equipment	Heald Machine Co.	DA-W-241-ORD-20	Boston Ordnance District	130,402.00	1/9/42
Grinding Equipment	Heald Machine Co.	DA-W241-ORD-50	Boston Ordnance District	979,950.00	6/30/42
Machine Aluminum, Alloy Cast Plates	S. M. Howes Co.	A-1960 Baldwin Loco. P.O. C-40012-666-F	A 10 Baldwin Loco. Wks.	176,867.00	11/1/42
Machine Aluminum, Alloy Cast Plates	S. M. Howes Co.	W-ORD-483 Baldwin Loco. P.O. C-40009-1497-F	A 10 Baldwin Loco. Wks.	176,867.00	12/1/42
Fuze, P.D., M52 (Metal Parts)	Ind. Lock Co.	W-241-ORD-302	Boston Ordnance District	965,000.00	1/31/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Lathes	Jones & Lamson Machine Co.	W 314-ORD-8552	Frankford	$ 148,677.25	~~2/42~~ Completed
Emergency Plant Facility	Jones & Lamson Machine Co.	W-241-ORD-319	Boston Ordnance District	1,220,000.00	
Drilling Equipment	Kingsbury Mach. Tool Corp.	W 241-ORD-335	Boston Ordnance District	1,204,216.00	6/6/42
Cartridge Cloth	Lonsdale Co.	W 672-ORD-3987	Picatinny	294,310.00	9/42
Cartridge Cloth	Lonsdale Co.	W 672-ORD-4396	Picatinny	137,311.00	completed ~~11/8/41~~
Ground Signals M20 and M21	Nat'l Fireworks Inc.	W 241-ORD-308	Boston Ordnance District	665,632.00	5/42
Loading 2 pounder Anti Tank Ammunition	Nat'l Fireworks Inc.	DA-W241-ORD-5	Boston Ordnance District	1,500,000.00	~~4/1/42~~ 6/43
Ground Signal M17,M19,M20	Nat'l Fireworks Inc.	W 241-ORD-348	Boston Ordnance District	288,103.02	~~12/41~~ 1/42
Shell, H.E. Streamline 6" Howitzer, Loading	Nat'l Fireworks Inc.	DA-W241-ORD-110	Boston Ordnance District	231,600.00	1/42
Wooden Crates and Packing Mat. for 75 mm.H.E. ammunition	Nat'l Fireworks Inc.	DA-W241-ORD-105	Boston Ordnance District	167,200.45	3/42 ←
Grinding Machines	Norton Co.	DA-W241-ORD-28	Boston Ordnance District	240,644.02	2/28/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Grinding Machines	Norton Co.	DA-W241-ORD-70	Boston Ordnance District	$ 166,503.00	3/31/42
Lathes	Potter & Johnston Mach. Co.	DA-W241-ORD-21	Boston Ordnance District	194,955.00	3/19/42
Lathes	Potter & Johnston Mach. Co.	DA-W241-ORD-25	Boston Ordnance District	179,284.00	6/30/42
Lathes	Reed Bros. Co., Inc.	DA-W241-ORD-27	Boston Ordnance District	116,056.00	9/9/41
Milling Machines	Reed Prentice Corp.	DA-W241-ORD-38	Boston Ordnance District	103,237.50	11/31/41
Lathes	Reed Prentice Corp.	DA-W241-ORD-30	Boston Ordnance District	184,207.00	11/ 1/41
Lathes	Reed Prentice Corp.	W-241-ORD-318	Boston Ordnance District	2,607,300.00	12/ 1/42
Lathes	Reed Prentice Corp.	DA-W241-ORD-31	Boston Ordnance District	156,040.00	Completed ~~11/30/41~~
Lathes	Reed Prentice Corp.	DA-W241-ORD-49	Boston Ordnance District	111,624.00	11/30/41
Lathes	Reed Prentice Corp.	DA-W241-ORD-69	Boston Ordnance District	150,085.00	1/20/42
Bands, Copper Driving for 7.2" B/L, S/L Shell	Revere Copper & Brass Co., Inc.	DA-W241-ORD-61	Boston Ordnance District	364,100.00	6/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Cartridge Cloth	R. I. Fabrics Co.	W-672-ORD-3689	Picatinny	$ 409,546.05	12/22/41
Cartridge Cloth	R. I. Fabrics Co.	W-672-ORD-4457	Picatinny	345,400.00	3/16/42 ~~1/1/42~~
Lathes	Rivett Lathe & Grinder, Inc.	P.O.727-41-309-E. D.	Raritan	118,236.80	11/41
Holder, Cartridge	Stevens-Walden, Inc.	W 852-ORD-10064	Springfield	1,033,106.25	4/42
Holder, Cartridge	Stevens-Walden, Inc.	W 852-ORD-9372	Springfield	126,272.00	12/3/ 41
Dies, Collets, and Punches	Stevens-Walden, Inc.	DA-W241-ORD-19	Boston Ordnance District	174,688.35	2/1/42
Emergency Plant Facility	Taft-Peirce Mfg. Co.	W241-ORD-305 W241-ORD-338	Boston Ordnance District	400,000.00 635,000.00	
Guns, 37 mm. M3 with extra parts	United Shoe Mach. Corp.	DA-W241-ORD-1	Boston Ordnance District	1,265,680.50	7/42
Guns, 37mm. M3 with extra parts	United Shoe Mach. Corp.	W-241-ORD-325	Boston Ordnance District	1,928,275.95	10/31/42
Supplemental Parts for Guns 37mm. M3 & M5	United Shoe Mach. Corp.	W-241-ORD-324	Boston Ordnance District	128,514.88	4/21/42
Tubes for Gun, 37mm. M4	United Shoe Mach. Corp.	W-241-ORD-352	Boston Ordnance District	357,125.00	
Fuze, Mech. Time, M43A1	Waltham Watch Co.	W-ORD-425	Chief of Ordnance	356,085.00	6/13/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Fuze, B. D. M58 (Metal Parts)	Waltham Watch Co.	W241-ORD-334	Boston Ordnance District	$ 150,530.40	5/42
Shell, 3"A.A. M42 (Mach.)	S. A. Woods Mach. Co.	W241-ORD-301	Boston Ordnance District	2,348,691.72	2/42
Booster, M20 (Metal parts)	Wright Mach. Co.	W241-ORD-303	Boston Ordnance District	1,100,070.00	3/42
Data Transmission Systems, T18	Saco-Lowell Shops	W314-ORD-10650	Frankford	6,439,500.00	8/42

a. Number of Prime Contracts being inspected from all sources - Total 292

1. District 53
2. Arsenal 148
3. Defense Aid 90
4. Foreign 1

b. Number of Sub-Inspection Requisitions - (Includes all Insp.-Req. not considered as Prime Contracts) - Total 528

1. Own District 58
2. Other Districts 377
3. Arsenals 93

c. Total number of all Inspection Requisitions and Contracts in force (a & b) - Total 820

d. Number of Officers predominantly on inspection duties - 4

e. Number of Civilian Inspectors (all grades) 257

5. Current Procurement (continued

(3) Current Inspection (continued)

f. Number of administrative and clerical employees predominantly on inspection work - 24

For the District Chief:

J. S. CRAWFORD
Lt. Colonel, Ordnance Dept., U.S.A.
Executive Officer

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B.O.D. No. 319.1/356

ERS/jwl/ob/mlg

December 26, 1941

Subject: Monthly Report of Activities - December

To: Chief of Ordnance
Washington, D. C.

ATTN: Industrial Service, District Control Division

1. Personnel

1. Military Personnel

a. No. of officers on duty:

Regular Army	-	1
Reserve Officers	-	32

b. No. of Reserve Officers authorized - 48

c. No. of Reserve Officers for whom active duty orders have been requested - 2

d. No. of New officers who reported for active duty - 0

2. Civilian Personnel

Civilian personnel on duty as of December 25 1941:

a. Custodial

CU-1	5	
CU-2	1	
CU-4	1	
CU-5	2	
CU-8	1	
		10

b. Clerical and Administrative

CAF-1	120	
CAF-2	26	
CAF-3	13	
CAF-4	9	
CAF-5	10	
CAF-6	1	
CAF-7	2	
CAF-8	1	
		182

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RG 156 . OFFICE OF THE CHIEF OF ORDNANCE

BOSTON ORDNANCE DISTRICT

Reports, 1939-44

Box 1 of 2

23-14-111

January 6, 1942

Subject: Monthly Report of Activities

To: Mail & Record

1. Boston Ordnance District Monthly Report of Activities for December, Paragraph 2, sub-paragraph g. should be amended to read as follows:

"g. Plant Protection

CAF-9	4
CAF-11	3
	7"

J. S. CRAWFORD
Lt. Colonel - Ordnance Department
Deputy District Chief

2. Civilian Personnel (continued)

c. Accountants

CAF-7	4	
CAF-9	1	
		5

d. Inspectors

(1) Ordnance Material

CAF-1	91		
CAF-2	69		
CAF-3	46		
CAF-4	39		
CAF-5	38		
CAF-6	15		
CAF-7	1	300	
CAF-8	1		

(2) Powder and Explosives

CAF-3	8	8	
			308

e. Sub-Professional

SP-1	1	
SP-2	1	
SP-3	9	
SP-4	1	
		12

f. Professional

P-1	9	
P-2	5	
P-3	4	
P-4	12	
P-5	2	
		32

g. Plant Protection

CAF-9	5	
CAF-11	3	
		8
	TOTAL	557

2. Surveys

a.	Number of new surveys	-	34
b.	Number of resurveys	-	31
c.	Number of plants visited for Procurement Planning purposes	-	25

3. Miscellaneous

December 6 - While on a visit to Headquarters First Corps Area, the Honorable Robert P. Patterson, Under Secretary of War, conferred with the Deputy District Chief and made an inspection of this office.

December 19 - Major Harry W. Bagnall, Public Relations Officer, and Russell J. Pierce, Assistant Engineer, attended the Manufacturers' Clinic held at the Armory, Concord, New Hampshire. The clinic was sponsored by the New Hampshire State Planning and Developing Commission and had an estimated attendance of four hundred.

The following engineering committee meetings, arranged by the Chief of Ordnance, were held during the past month:

Committee:	Adapter Booster
Date:	December 1, 1941
Place:	Washington, D. C.
Office Representative	Thomas E. Cameron, Government Inspector
Company Invited:	Wright Machine Company
Committee:	Bar Stock Shell
Date:	December 19, 1941
Place:	Washington, D. C.
Office Representative:	Lt. John R. Bird
Committee:	Special 20 mm. Cartridge Case
Date:	December 3, 1941
Place:	Detroit, Michigan
Office Representative:	John C. Hamilton, Government Engineer
Company Invited:	A. S. Campbell Co., Inc.
Committee:	Metallic Belt Link
Date:	December 5, 1941
Place:	Fall River, Massachusetts
Office Representative:	Lt. Colonel J. S. Crawford
	Major John C. Solberg
	Captain Richard D. Wilhite
	Harold C. Chase, Government Inspector

3. Miscellaneous (continued)

Engineering Committee Meetings (continued)

Committee:	Rifled Bore Shell
Date:	December 12, 1941
Place:	Aberdeen, Maryland
Office Representatives:	Lt. Colonel J. S. Crawford George T. Huxford, Government Engineer
Company Invited:	S. A. Woods Machine Company
Committee:	37 A. P. Shot
Date:	December 8, 1941
Place:	Washington, D. C.
Office Representative:	Major Leroy E. Briggs
Company Invited:	Stevens-Walden Company
Sub-Committee:	A. P. Projectile and Bullet Core Steel
Date:	December 19, 1941
Place:	Aberdeen, Maryland
Office Representative:	Major Leroy E. Briggs
Company Invited:	S. A.Woods Machine Company

During period covered by current report, there were 1,637 visitors to the District Office.

There were 9,416 pieces of incoming and 12,353 pieces of outgoing mail during current report period.

4. Educational Orders

W-ORD-363 C. H. Cowdrey Machine Works
Fitchburg, Massachusetts

75 mm. Pack Howitzer, M1A1

All progress on this Educational Order Contract is at present confined to work on one oversized tube which, upon completion, will be sent to Aberdeen Proving Ground for proof firing. This tube has been threaded and slotted, and is now ready for rifling, after which hoops will be shrunk on the piece and shipment probably made within the coming month. Other components of the gun are in the following stages of completion:

One Breech Ring - 75% complete - Threading, slotting, and outside work is being performed on this ring.

4. Educational Orders (continued)

W-ORD-363 (continued)

21 Breech Rings - 60% complete - No work is being done on these at present. They are now ready for slotting and cutting of recess for the block.

21 Tubes - 55% complete - No work is being performed on these at present.

22 Breech Blocks - 95% complete - Ready to case carburize

All other components have been finished.

Appropriated		Disbursed
Pack Howitzer	$ 66,540.00	$15,856.17
Mfg. Equipment	109,680.25	94,900.44
	$176,220.25	$110,756.61

W-ORD-411 Builders Iron Foundry
Providence, Rhode Island

Mount, Telescope, M15A1

Final inspection of gages, jigs, and fixtures, etc., procured on the Educational Order Contract, is being made at this District's Gage Laboratory. The Production Analysis on this contract evidenced further progress during the past month.

Appropriated		Disbursed
Mount Telescope	$13,784.22	None
Mfg. Equipment	91,435.07	$66,407.95
	$105,219.29	$66,407.95

W-ORD-395 Harrington and Richardson Arms Company
Worcester, Massachusetts

Pistol, Automatic, Caliber .45, M1911A1

Little progress was made on this Educational Order during the past month. Some trouble seems to be experienced in certain manufacturing operations.

4. Educational Orders (continued)

W-ORD-395 (continued)

The following procurement of Items 2 through 5, inclusive, has been made:

Gages	80%	Punches and Dies	45%
Fixtures	75%	Machine Tools	70%

Machining operations on Item 1 are 20% completed.

No appreciable progress was made on the Production Analysis.

Appropriated		Disbursed
Pistols	$15,545.00	$ 4,404.33
Mfg. Equipment	182,257.35	119,588.35 *
	$197,802.35	$123,992.68

*The reduction in disbursement from the figure given last month was occasioned by a refund from Harrington and Richardson Arms Company of $2,092.50 on Supplemental Agreement No. 4. This occurred as a result of the deletion from the contract, through this Supplemental Agreement, of certain gages, jigs, and fixtures, etc., which were previously paid for.

W-ORD-425 Waltham Watch Company
Waltham, Massachusetts

Fuze, Mechanical Time, M43A1

Assembly of this time fuze did not progress as anticipated, due to the encountering of considerable trouble in processing of the escapement lever.

New fixtures for this component were manufactured, which should give a greater degree of accuracy in the milling of the pallets. All other units of the assembly are satisfactory.

The new Torsional Test Mechanism for the Lower Cap, Body Assembly, has been added to the tool setup, together with a combination Spinning and Torsional Test Machine for the Timing Disc Assembly.

The first lot of 250 Fuzes should be assembled within the coming month.

Appropriated		Disbursed
Fuze	$127,284.40	None
Mfg. Equipment	254,060.00	$215,008.51
	$381,344.40	$215,008.51

4. Educational Orders (continued)

W-ORD-451 Albert & J. M. Anderson Manufacturing Company
Boston, Massachusetts

Case, Cartridge, 3" A. A., MkIIM2

A final inspection is being made of certain gages on this Educational Order at our District Laboratory. The Production Analysis is being checked for acceptance.

Appropriated		Disbursed
Cartridge Cases	$ 90,000.00	$10,430.32
Mfg. Equipment	26,040.00	4,308.00
	$116,040.00	$14,738.52

W-ORD-341 S. A. Woods Machine Company
Boston, Massachusetts

The entire set of gages procured under this Educational Order Contract is being leased to the Murray Company, Atlanta, Georgia.

5. Current Procurement

(1) Status of District Contracts and Negotiations

A. Machine Tools

Letter of Intent or Letter Contract submitted to Contractor, not yet Accepted:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Letter of Intent or Letter Contract Accepted by Contractor:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Production Plan Submitted to Ordnance Office, not yet Approved:

NOT APPLICABLE

5. Current Procurement (continued)

A. Machine Tools (continued)

Production Plan Approved and Received:

NOT APPLICABLE

Formal Contract or Definitive Supplement to Letter Contract Prepared and Submitted to Contractor for Signature:

a. Regular Ordnance:

NONE

b. Defense Aid:

DA W-241-ORD-176; U.K. Req. 5692; B. C. Ames Co.; formal contract.
DA W-241-ORD-172; U.K. Req. 5256, 5315; Union Twist Drill Co.; formal contract.
DA W-241-ORD-171; U.K. Req. 4672, 5431; Heald Machine Co.; formal contract.
DA W-241-ORD-170; U.K. Req. 5080; Norton Company; formal contract
DA W-241-ORD-155; U.K. Req. 5574; Cone Automatic Machine Co.; formal contract.
DA W-241-ORD-140; U.K. Req. 3545, 3474; Jones & Lamson; formal contract.
DA W-241-ORD-98; U.K. Req. 3628, 3582; Brown & Sharpe; formal contract.
DA W-241-ORD-89; U.K. Req. 3485; Brown & Sharpe; formal contract.

Formal Contract or Definitive Supplement to Letter Contract Accepted by the Contractor and forwarded to Ordnance Office:

a. Regular Ordnance:

NONE

b. Defense Aid:

DA W-241-ORD-151; U.K. Req. 3685, 4157, 4450; Norton Company; formal contract; Accepted Nov. 27, 1941.
DA W-241-ORD-124; U.K. Req. 3905, 3905A; Potter & Johnston Co.; Supplement No. 1; Accepted Dec. 2, 1941.
DA W-241-ORD-107; U.K. Req. 3699, 4097; Reed-Prentice Corp.; Supplement No. 1; Accepted Nov. 13, 1941.

5. Current Procurement (continued)

A. Machine Tools (continued)

DA W-241-ORD-95; U.K. Req. 3319, 3343, 3344; Heald Machine Co.; Supplement No. 1, Accepted Nov. 27, 1941.
DA W-241-ORD-68; U.K. Req. 2459; Builders Iron Foundry; Supplement No. 1; Accepted Dec. 1, 1941.
DA W-241-ORD-66; U.K. Req. 2981; Fitchburg Grinding Machine Corp.; Supplement No. 1; Accepted Nov. 15, 1941.
DA W-241-ORD-15; U.K. Req. 241, 296, 267, 729; Norton Company; Supplement No. 1; Accepted Oct. 18, 1941.

Formal Contract or Definitive Supplement to Letter Contract Received Back from Ordnance Office for Correction:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Approved for Distribution:

a. Regular Ordnance:

NONE

b. Defense Aid:

DA W-241-ORD-174; U.K. Req. 4310; Franklin Machine & Foundry Co.; formal contract; Accepted Dec. 19, 1941.
DA W-241-ORD-169; U.K. Req. 5243, 5243-A; H. Leach Machinery Co.; formal contract; Accepted Dec. 20, 1941.
DA W-241-ORD-168; U.K. Req. 5516; Chadwick & Trefethen; formal contract; Accepted Dec. 22, 1941.
DA W-241-ORD-166; U.K. Req. 5632; Wade Tool Co.; formal contract.
DA W-241-ORD-164; U.K. Req. 5457, 5569, 5569-A; Bryant Chucking Grinder Co.; formal contract; Accepted Dec. 24, 1941.
DA W-241-ORD-157; U.K. Req. 5278; J. T. Slocomb Co., formal contract.

5. Current Procurement (continued)

A. Machine Tools (continued)

DA W-241-ORD-149; U.K. Req. 5070, 5110; Taft-Peirce Mfg. Co.; formal contract; Accepted Dec. 18, 1941.

DA W-241-ORD-148; U.K. Req. 4080, 4121; Arter Grinding Co.; formal contract; Accepted Dec. 11, 1941.

DA W-241-ORD-146; U.K. Req. 3855, 3855-A, 3855-A2; Reed-Prentice Corp.; formal contract; Accepted Dec. 15, 1941.

DA W-241-ORD-138; U.K. Req. 3875, 4110, 4470, 4111; Heald Machine Co.; formal contract; Accepted Dec. 15, 1941.

B. Ammunition Division

Letter of Intent or Letter Contract Submitted to Contractor, not yet Accepted:

a. Regular Ordnance:

W-241-ORD-373; Warren Telechron Co.; Primer, Percussion, M23A1.

W-241-ORD-372; Cohn & Rosenberger; Primer, Percussion, M23A1.

W-241-ORD-371; Pantex Pressing Machine Co.; Shot, A.P., 20 mm. M75 (Metal Parts).

W-241-ORD-356; S. A. Woods Machine Co.; Shot, S.A.P., M72, 75 mm. Gun, Metal Parts.

b. Defense Aid:

DA W-241-ORD-163; National Fireworks; Loading, packing, assembling of fuze, percussion 231, M 3/L.

Letter of Intent or Letter Contract Accepted by Contractor:

a. Regular Ordnance:

W-241-ORD-369; Warren Telechron Co.; Primer, Percussion, Q.F. 40 mm. No. 12, Mk II/L, Accepted Dec. 2, 1941.

W-241-ORD-368; Wright Machine Co.; Booster M20, Metal Parts; Accepted Dec. 10, 1941.

W-241-ORD-365; Draper Co.; Shot, Semi-A.P., 37 mm., M74, Metal Parts; Accepted Nov. 27, 1941.

5. Current Procurement (continued)

B. Ammunition Division (continued)

W-241-ORD-363; Whitin Machine Works; Shot, S.A.P., 37 mm., M74, Metal Parts; Accepted Dec. 1, 1941.
W-241-ORD-362; Stevens-Walden Co.; Shot, S.A.P., 37 mm., M74; Accepted Nov. 17, 1941.

b. Defense Aid:

DA W-241-ORD-147; National Fireworks, Inc.; 5.5" Shells with 60/40 Amatol, including procurement and loading of exploder shell and smoke box; Accepted Nov. 24, 1941.

Plans of Production Submitted to Ordnance Office, not yet Approved:

a. Regular Ordnance:

W-241-ORD-372; Cohn & Rosenberger; Primer, Percussion, M23A1.
W-241-ORD-364; U.S. Textile Weaving Corporation; Silk, Parachute, Pyrotechnic, Class A.
W-241-ORD-369; Warren Telechron Company; Primer, Percussion, #12 Mk. II/L.

b. Defense Aid:

NONE

Plans of Production Approved and Received:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Prepared and Submitted to Contractor for Signature:

a. Regular Ordnance:

W-241-ORD-364; U.S. Textile Weaving Corp.; Silk, Parachute, Pyrotechnic, Class A; formal contract.

5. Current Procurement (continued)

B. Ammunition Division (continued)

W-241-ORD-361; William E. Wright & Sons Co.; Parachute for flare, aircraft, M26; formal contract.
W-241-ORD-355; Ripley & Gowen Co., Inc.; Aluminum Detonator Parts; formal contract.

b. Defense Aid:

DA W-241-ORD-134; Ripley & Gowen Co., Inc.; Aluminum Detonator Parts; formal contract.
DA W-241-ORD-122; Rockwood Sprinkler Co.; Container, Steel, Shell, Exploder, No. 1, Mk III/L/; Supplement No. 1.
DA W-241-ORD-110; National Fireworks, Inc.; Loading; Assembling and Packing of 6" Howitzer Shells, Mk. ID/L/, with 60/40 Amatol, including procurement and loading of Exploder Shell and Smoke Box; Supplement No. 1.
DA W-241-ORD-105; National Fireworks, Inc.; Wooden crates and packing material for 75 mm., H. E., Ammunition; Supplement No. 1.
DA W-241-ORD-5; National Fireworks, Inc.; 2 lb. Anti-Tank Ammunition, Supplement No. 1.

Formal Contract or Definitive Supplement to Letter Contract Accepted by Contractor and Forwarded to Ordnance Office:

a. Regular Ordnance:

W-241-ORD-344, Cohn & Rosenberger Co.; fuzes, B.D., M58; Accepted Nov. 28, 1941; Supplement No. 1.
W-241-ORD-334, Waltham Watch Co.; Fuze, B.D., M58 (Metal Parts Assembly), Supplement No. 2, Accepted Dec. 5, 1941.

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Received Back from Ordnance Office for Correction:

a. Regular Ordnance:

NONE

5. Current Procurement (continued)

B. Ammunition Division (continued)

b. Defense Aid:

DA W-241-ORD-48; Excel Foundry Co.; Loading, assembling and packing of fuze, DA & Percussion #119, Mk. 12/L, Exploder Shell "B" Mk VI., Supplement No. 1, Accepted October 4, 1941.

Formal Contract or Definitive Supplement to Letter Contract Approved for Distribution:

a. Regular Ordnance:

W-241-ORD-360; Freeman-Daughaday; Aluminum Detonator parts; Supplement No. 1; Accepted Dec. 18, 1941.

W-241-ORD-328; The Framanco Co.; Metal Parts for Hispano Guns; Supplement No. 1.

b. Defense Aid:

DA W-241-ORD-86; Florence Stove Co.; Box & Container, 2 Pounder Ammunition; Supplement No. 1; Accepted Dec. 23, 1941.

DA W-241-ORD-74; Estey Organ Company; Wooden Boxes for 2 Pounder A.P. Ammunition; Supplement No. 1; Accepted Dec. 22, 1941.

DA W-241-ORD-73; Florence Stove Co.; Metal Liners for 2 Pounder A.P. Ammunition Boxes; Supplement No. 1.

DA W-241-ORD-62; Estey Organ Co.; Boxes, Wooden, for 20 mm. Ammunition; Supplement No. 1; Accepted Dec. 22, 1941.

C. Artillery Division

Letter of Intent or Letter Contract Submitted to Contractor, not yet Accepted:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

5. Current Procurement (continued)

C. Artillery Division (continued)

Letter of intent or Letter Contract Accepted by Contractor:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Production Plan Submitted to Ordnance Office, not yet Approved:

a. Regular Ordnance:

W-241-ORD-357; United Shoe Machinery Corporation Mfg. 37 mm Gun, M6; Spare Parts, 37 mm Gun, M6; Jigs and Fixtures, 37 mm Gun, M6.
W-241-ORD-352; United Shoe Machinery Corporation Mfg. Tubes, 37 mm Guns, M4; Jigs and Fixtures, 37 mm Gun, M4.

b. Defense Aid:

* DA W 241 ORD-1, China Requisition #205 United Shoe Machinery Corp. Mfg. 37 mm Guns, M3; Spare Parts, 37 mm Guns, M3.

* Supplemental Agreement No. 1

Production Plan Approved and Received:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Prepared and Submitted to Contractor for Signature:

a. Regular Ordnance:

W 241 ORD-357; United Shoe Machinery Corp.; 37 mm. Gun, M6; formal contract.

5. Current Procurement (continued)

C. Artillery Division (continued)

W 241 ORD-352; United Shoe Machinery Corp.; Tubes for 37 mm. A.C. Gun, M4; formal contract.

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Accepted by Contractor and Forwarded to Ordnance Office:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Received Back from Ordnance Office for Correction:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Approved for Distribution:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

D. Small Arms Division

Letter of Intent or Letter Contract Submitted to Contractor, not yet Accepted:

a. Regular Ordnance:

W 241 ORD-346, Harrington & Richardson, Pistols, Colt Automatic, Calibre .45, M1911A1

5. Current Procurement (continued)

D. Small Arms Division (continued)

W 241 ORD-343, Harrington & Richardson, Pistols, Colt Automatic, Calibre .45, M1911A1

b. Defense Aid:

NONE

Letter of Intent or Letter Contract Accepted by Contractor:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Production Plan Submitted to Ordnance Office, not yet approved:

a. Regular Ordnance:

W 241 ORD-343, Harrington & Richardson Arms Co., Pistol, M1911A1
W 241 ORD-346, Harrington & Richardson Arms Co., Pistol, M1911A1
W 241 ORD-350, Beckwith Mfg. Co., Scabbard, Bayonet, M3

b. Defense Aid:

DA W 241 ORD-6, Harrington & Richardson Arms Co., Pistol, M1911A1
DA W 241 ORD-102, Beckwith Mfg. Co., Scabbard, Bayonet, M3

Production Plan Approved and Received:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Prepared and Submitted to Contractor for Signature:

5. Current Procurement (continued)

D. Small Arms Division (continued)

a. Regular Ordnance:

NONE

b. Defense Aid:

DA W 241 ORD-102, Beckwith Mfg. Co., Scabbards, Bayonet, M3, Sup. No. 1

Formal Contract or Definitive Supplement to Letter Contract Accepted by Contractor and Forwarded to Ordnance Office:

a. Regular Ordnance:

NONE

b. Defense Aid:

DA W 241 ORD-6; Harrington & Richardson Arms Co.; Pistols, Calibre .45, M1911A1, Supplement No. 1, Accepted October 20, 1941.

Formal Contract or Definitive Supplement to Letter Contract Received back from Ordnance Office for Correction:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

Formal Contract or Definitive Supplement to Letter Contract Approved for Distribution:

a. Regular Ordnance:

NONE

b. Defense Aid:

NONE

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities

A. New Negotiations During Period Covered by this Report

AMMUNITION DIVISION

Quantity	Item
1,500,000	Fuze PD M57
5,000	Adapter Booster M110
500,000	Fuze PD M56
1,000,000	Projectile, Ball, 20 mm. Hispano Gun/A/
5,000	Adapter for Bomb A.P. #1000 M52
100,000	Projectile, Canister 37 mm. M2
140,000	Shell HE 37 mm. M63
14,000	Box, Wood Packing for Bomb, Chem. 100# M47
1,325,538	Case, Cartridge, 20 mm. M21
4,500,000	Shell HE 20 mm. MK I Hispano Gun/A/
5,225,000	Disc, Aluminum for Fuze BD M58 Pc. MK73-1-175K
1,500,000	Primer, Percussion M23A1
1,000,000	Primer, Percussion M28A
1,200,000	Fuze BD M58
875,220	Light, Signal, Very, MK II White Star, Complete
875,220	Light, Signal, Very, MK II Red Star, Complete
400,000	Fuze PD M52
100,000	Packing of 75 mm. H.E. Loaded Ammunition in Packing Crates for Overseas Shipment (12 rounds in in 4 bundles per crate, including procurement of crates
1,313,000	Primer, Percussion M33
600,000	Shell, H.E, 3" M42
225,000	Booster, M22
100,000	Case, Cartridge 3" MK II M2

ARTILLERY DIVISION

	Mount, Telescope, M19, D.A.
	Mount, Telescope, M19
	Clock, Message Center, M1, w/case
	Watch, Wrist, 7-jewel
	Watch, Pocket, 15-jewel
	Watch, Wrist, 15-jewel
2,400/mo.	Medium Tank Transmissions and Final Drive Assemblies
Unspecified	Generator, Auxiliary, Medium Tank, M3
1,490	75 mm, Pack Howitzer, M1A1, w/extra parts
2,000	37 mm. Guns, M6 w/extra parts
4,700	37 mm. Guns, M6 w/extra parts
835	37 mm. Guns, M3 w/extra parts
5,535	37 mm. Guns, M3 w/extra parts

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

B. Bids Submitted to Washington During Period Covered By This Report

AMMUNITION DIVISION

Date Teletype Submitted	Item	Facility	Quantity
11/26/41	Fuze, Percussion, D.A. #251 Mk I/L	Morse Lockhart & Morse, Inc.	100,000 (alt)200,000
11/26/41	Fuze, Percussion, D.A. #251 Mk I/L	Cohn & Rosenberger, Inc.	365,000
11/25/41	Fuze, Percussion, D.A. #251 Mk I/L	R. R. Simmons Co.	365,000
11/25/41	Fuze, Percussion, D.A. #251 Mk I/L	Warren Telechron Co.	365,000
12/1/41	Fuze, Percussion, D.A. #251 Mk I/L	Cohn & Rosenberger, Inc.	365,000 (Rev. Bid)
12/4/41	Loading and Assembly, Candle & Base Block; Assembly, Flare, Aircraft, Parachute M26	National Fireworks, Inc.	421,645
12/1/41	Shot A.P. 20 mm. M75	Whitin Machine Works	500,000
12/1/41	Shot A.P. 20 mm. M75	Pantex Pressing Machine Company	1,000,000
12/6/41	Shot A.P. 20 mm. M75	James A. Doran	240,000
12/5/41	Shot A.P. 20 mm. M75	Walworth Company	1,600,000
12/8/41	Shell H.E. 20 mm. Mk I /A/Hisp. Gun	James A. Doran	240,000
12/9/41	Primer Percussion M1B1A1	Arnold-Copeland Co., Inc.	3,000,000
12/9/41	Primer Percussion M1B1A1	Lew Mfg. Company	3,000,000
12/10/41	Primer Percussion M1B1A1	T. U. Foster & Brothers Co., Inc.	3,000,000
12/10/41	Primer Percussion M1B1A1	Automatic Machine Products Company	3,000,000
12/10/41	Shell H.E. 20 mm. Mk I	Whitin Machine Works	500,000 (alt)812,000
12/12/41	Aluminum Discs, Fuze B.D M58 Pc. Mk 73-1-175K	Waltham Watch Co.	5,000,000
12/12/41	Aluminum Discs, Fuze B.D M58 Pc. Mk 73-1-175K	Cohn & Rosenberger, Inc.	5,000,000
12/13/41	Case, Cartridge 3" A.A. Mk II M2	A. & J. M. Anderson Manufacturing Co.	100,000
12/13/41	Fuze B. N. M104	Warren Telechron Co.	250,000
12/17/41	Projectile, Ball 20 mm. Hisp. Gun/A/	Parsons-Majestic Manufacturing Company	1,000,000

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Date Teletype Submitted	Item	Facility	Quantity
12/16/41	Fuze P.D. M57	Wright Machine Co.	1,500,000
12/15/41	Beeswax	Whittemore-Wright Co., Inc.	26,300
12/15/41	Fuze P.D. M56	Wright Machine Co.	500,000
12/16/41	Fuze P.D. M57	Brier Manufacturing Co.	250,000
12/16/41	Fuze P.D. M57	Independent Lock Company	1,500,000
12/16/41	Fuze P.D. M57	Morse Lockhart & Morse, Inc.	1,500,000
12/15/41	Projectile, Ball 20 mm. Hispano Gun /A/	Fisher-Pierce Company	1,000,000
12/15/41	Projectile, Ball 20 mm. Hispano Gun /A/	Whitin Machine Works	500,000
12/17/41	Box, Wood, Packing for Bomb Chemical 100# M47	Chaffee Brothers	14,000
12/17/41	Projectile, Ball, 20 mm. Hispano Gun /A/	Whitin Machine Works	1,000,000 (alt)500,000 (Revised Bid)
12/18/41	Light, Signal, Very, Mk II Red Star, Complete	American Fireworks Co. of Massachusetts	875,200
12/18/41	Light, Signal, Very, Mk II White Star Complete	American Fireworks Co. of Massachusetts	875,200
12/23/41	Shell H.E. 37 mm. M63	Keystone Manufacturing Co.	140,000
12/23/41	Shell H.E. 37 mm. M63	Heywood-Wakefield Co.	140,000
12/23/41	Projectile, Canister, 37mm. M2	Gero Products Inc.	100,000
12/23/41	Projectile, Canister, 37mm. M2	Arnold-Copeland Co., Inc.	100,000
12/23/41	Projectile, Canister, 37mm. M2	Glenwood Range Company	100,000
12/23/41	Projectile, Canister, 37mm. M2	Artcraft Metal Products, Inc.	100,000
12/23/41	Projectile, Canister, 37mm. M2	Sexton Can Company	100,000
12/23/41	Projectile, Canister, 37mm. M2	Market Forge Company	100,000
12/23/41	Projectile, Canister, 37mm. M2	Howes-Woods	100,000
12/23/41	Projectile, Canister, 37mm. M2	Heywood-Wakefield Company	100,000
12/23/41	Projectile, Canister, 37mm. M2	Teiner-Torngren Company	100,000

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

Date Teletype Submitted	Item	Facility	Quantity
12/23/41	Projectile, Canister, 37 mm. M2	Whiting & Davis Company	100,000
12/23/41	Projectile, Canister, 37 mm. M2	Heinze Electrical Co.	100,000
12/23/41	Projectile, Canister, 37 mm. M2	H. E. Wright Company	100,000
12/23/41	Projectile, Canister, 37 mm. M2	Keystone Manufacturing Co.	100,000
	ARTILLERY DIVISION		
12/16/41	Mount, Telescope, M19	Lundquist Tool & Mfg. Co.	
12/16/41	(DA) Mount, Telescope, M19	Lundquist Tool & Mfg. Co.	
12/15/41	Clock, Message Center, M1 w/case	Chelsea Clock Company	
12/15/41	Watch, Wrist, 7-jewel	Waltham Watch Company	
12/15/41	Watch, Pocket, 15-jewel	Waltham Watch Company	
12/15/41	Watch, Wrist, 15-jewel	Waltham Watch Company	
12/10/41	Medium Tank Track Body C73918	H & B American Machine Co.	100,000/mo
12/8/41	Drive Sprocket, Medium Tank	Union Gear Works	
12/10/41	Drive Sprocket, Medium Tank	Underwood Machinery Co.	
12/17/41	37 mm. Carriage, M4 for Self-Prop. Mount	Saco-Lowell Shops	2,100
12/18/41	37 mm. Gun, M6	United Shoe Machinery Corporation	2,000

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

C. MACHINE TOOLS - DEFENSE AID

Company	U. K. Requisition No.

Prices have been submitted to Washington to cover the U. K. Requisitions shown opposite each of the following companies:

T. R. Almond Mfg. Co.	6599
Arter Grinding Machine Co.	5986
Brown & Sharpe Mfg. Co.	1847A-3, 5249, 5668, 5770,
Brown & Sharpe Mfg. Co.	5847, 5849, 5948, 5995, 6091,
Brown & Sharpe Mfg. Co.	6099, 6141, 6143, 6157, 6278,
Brown & Sharpe Mfg. Co.	6393, 6395, 6397, 6414, 6419,
Brown & Sharpe Mfg. Co.	6422, 6429, 6438, 6450, 6451,
Brown & Sharpe Mfg. Co.	6475, 6495, 6530, 6574, 6582,
Brown & Sharpe Mfg. Co.	6771
Bryant Chucking Grinder Co.	5461, 6305, 6491
Builders Iron Foundry	5931, 5934, 6069
S. W. Card Mfg. Co.	6336
Chadwick & Trefethen	6663
Circular Tool Co.	6723
Cone Automatic Machine Co.	5765, 6725
F. W. Derbyshire, Inc.	6220
Duplicate Parts, Inc.	7318
Fellows Gear Shaper Co.	5944, 6111
C. I. Hayes, Inc.	6745
The Heald Machine Co.	5738
Jones & Lamson Machine Co.	5812, 6352, 6656
The Lapointe Machine Tool Co.	6632
Norton Co.	5763, 5811, 6442, 6597, 6761
Potter & Johnston Machine Co.	5871
Reed-Prentice Corp.	5797, 5980, 6604
Rivett Lathe & Grinder, Inc.	5775, 5950
Scott & Williams, Inc.	6767

Request to proceed with the preparation and execution of the formal contract covering the approved award has been received to cover the U. K. Requisitions shown opposite each of the following companies:

Abrasive Machine Tool Co.	5554, 6018, 6348
B. C. Ames Co.	5692
Avion Machine & Tool Co.	6269
Brown & Sharpe Mfg. Co.	3047, 4498, 4503, 4580, 5125,
Brown & Sharpe Mfg. Co.	5202, 5235, 5247, 5469, 5493,
Brown & Sharpe Mfg. Co.	5515, 5588, 5693, 5700, 5807

5. Current Procurement (continued)

(2) Miscellaneous Current Procurement Activities (continued)

C. MACHINE TOOLS - DEFENSE AID (continued)

Company	U. K. Requisition No.
Circular Tool Co.	6317
Fellows Gear Shaper Co.	5464
The Heald Machine Co.	4370, 4542, 4672, 5056, 5431
Jones & Lamson Machine Co.	4539, 5054, 5676
The Lapointe Machine Tool Co.	5750, 5957
Norton Co.	5080, 5666
Reed-Prentice Corp.	4691, 5057
Sleeper & Hartley, Inc.	5863
The Taft-Peirce Mfg. Co.	6027
Trimont Mfg. Co.	5894
Union Twist Drill Co.	5315, 5256

Prices will be submitted shortly to cover the U. K. Requisitions shown opposite each of the following companies so that procurement authority can be issued:

Anderson Products, Inc.	7300
Arter Grinding Machine Co.	7315
Brown & Sharpe Mfg. Co.	5794, 5800, 5973, 6043, 6423,
Brown & Sharpe Mfg. Co.	6547, 6567, 6575, 6606, 6647,
Brown & Sharpe Mfg. Co.	6733, 6738, 6778, 6838, 7420,
Brown & Sharpe Mfg. Co.	7298
Bryant Chucking Grinder Co.	5897
Builders Iron Foundry	6434
Cone Automatic Machine Co.	5487, 6576
Fellows Gear Shaper Co.	6002
Fitchburg Grinding Machine Corp.	7358
Henry L. Hanson	7375
The Heald Machine Co.	5820, 6655, 6740, 7356, 7382
Jones & Lamson Machine Co.	6024, 6648, 6774, 6782, 6746,
Jones & Lamson Machine Co.	7314
The Lapointe Machine Tool Co.	7331
Morse Twist Drill & Machine Co.	5788, 5823, 6379, 6544
Norton Co.	7305
Potter & Johnston Machine Co.	6054
Reed-Prentice Corp.	5672

Company	R. Requisition No.
Cone Automatic Machine Co.	85
Fellows Gear Shaper Co.	62, 63, 64, 65, 66, 67

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Guanadine Nitrate	American Cyanamid & Chemical Corp., Maynard, Mass.	DA W-613-ORD-4	New York $ Ordnance District	640,000.00	
Case, Cartridge, 3" A.A. Mk 2 M2	Albert & J. M. Anderson Mfg. Co., Boston, Mass.	W-241-ORD-304	Boston Ordnance District	1,623,930.00	7/1/42
Primer Bodies for Primer, Percussion, M1B1A1	Automatic Mach. Products Co., Attleboro, Mass.	W-672-ORD-3476	Picatinny	591,294.00	2/5/42
Primer, Percussion, M1B1A1 (Metal Parts)	Automatic Mach. Products Co., Attleboro, Mass.	DA W-241-ORD-24	Boston Ordnance District	108,000.00	5/42
Primer, Percussion, M1B1A1 (Metal Parts)	Automatic Mach. Products Co., Attleboro, Mass.	W-241-ORD-332	Boston Ordnance District	621,756.00	5/42
Helmet Linings (Group Assemblies)	Bates Shoe Co., Webster, Mass.	W-741-ORD-7275	Rock Island	705,350.96	Completed
Helmet Linings (Group Assemblies)	Bates Shoe Co. Webster, Mass.	W-741-ORD-9150	Rock Island	278,800.00	12/31/41
Emergency Plant Facility	John Bath & Co., Inc. Worcester, Mass.	W-241-ORD-307	Boston Ordnance District	775,000.00	
Tools, Carbon Removing, For Cal. .30 B.M.G. M2 AC	Bay Products Corporation Newton, Mass.	W-852-ORD-9960	Springfield	219,002.41	3/23/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Scabbard, Bayonet, M3	Beckwith Mfg. Co., Dover, N.H.	W-241-ORD-350, DA W-241-ORD-102	Boston Ordnance District	$ 750,000.00	11/30/42
Machine Tools	Brown & Sharpe Mfg. Co. Providence, R.I.	DA W-241-ORD 35	Boston Ordnance District	719,325.00	3/42
Hole Grinders	Bryant Chucking Co., Springfield, Vt.	DA W-241-ORD-11	Boston Ordnance District	116,669.50	3/31/42
Emergency Plant Facility	Bryant Chucking Co., Springfield, Vt.	W-241-ORD-320	Boston Ordnance District	1,088,650.00	
Drilling Machines	Builders Iron Foundry, Providence, R. I.	DA W-241-ORD-68	Boston Ordnance District	105,367.50	1/42
Mount, Telescope, M23	Builders Iron Foundry, Providence, R. I.	W-314-ORD-9439	Frankford	436,830.60	12/31/42
Primer, Percussion, M23A1 (Metal Parts)	Cambridge Screw Co., Cambridge, Mass.	W-241-ORD-331	Boston Ordnance District	270,987.50	3/42
Case, Cartridge, 20 mm. M21 Hispano Gun/A	A. S. Campbell Co., Inc., E. Boston, Mass.	DA W-241 ORD-8	Boston Ordnance District	1,880,736.00	4/42
Fuze, B. D., M58 (Metal Parts)	Cohn & Rosenberger Co., Providence, R.I.	W-241-ORD-344	Boston Ordnance District	220,000.00	10/42
Auto. Screw Machines	Cone Auto. Machine Co., Inc. Windsor, Vt.	W-241-ORD-327	Boston Ordnance District	2,640,000.00	8/1/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Howitzer, Pack, 75 mm. M1A1	C. H. Cowdrey Machine Works Fitchburg, Mass.	W-ORD-363	Chief of Ordnance	$ 174,208.50	
Gun, 75 mm. M2	C. H. Cowdrey Machine Works Fitchburg, Mass.	W-953-ORD-1140	Watervliet	3,566,800.00	11/42
Mounts, Telescope, M24	Cummings Mach. Works, Boston, Mass.	DA W-314-ORD-122	Frankford	331,039.00	1/21/43
Mounts, Telescope, M26, M27, M28, M29	Cummings Mach. Works, Boston, Mass.	W-314-ORD-12470 DA W-314-ORD-204	Frankford Arsenal	725,252.70	4/30/43
Shot, S.A.P. 37 mm., M74 (Metal Parts)	Draper Corp. Hopedale, Mass.	W-241-ORD-365	Boston Ordnance District	132,500.00	6/30/42
Wooden Boxes for 20 mm. H5 Gun, Ammunition	Estey Organ Corp., Brattleboro, Vt.	DA W-241-ORD-62	Boston Ordnance District	115,625.37	5/5/42
Fuze, DA & Percussion, No. 119 MK IV/L & Exploder Shell "B" MK VI Loading	Excel Foundry & Machine Co. Fall River, Mass.	DA-W241-ORD-48	Boston Ordnance District	2,494,000.00	
Metallic Belt Links, Cal. 50 M1	Firestone Steel Prod. Co. Fall River, Mass.	W-741-ORD-6660	Rock Island	4,665,898.50	6/43
Universal Grinders	Fitchburg Grinding Mach. Co., Fitchburg, Mass.	DA-W241-ORD 66	Boston Ordnance District	109,620.00	3/21/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Boxes and Containers for 2 Pounder Ammunition	Florence Stove Co., Gardner, Mass.	DA W-241-ORD-86	Boston Ordnance District	$ 536,250.00	4/42
Shell, 20 mm. H.E. (Machining) for Hispano Gun /A/	Framanco Co., Framingham, Mass.	W-241-ORD-328	Boston Ordnance District	545,670.00	5/42
Cartridge Cloth, Cotton, Grade C	Glenlyon Print Works, Phillipsdale, R.I.	W-672-ORD-4521	Picatinny	605,590.00	2/25/42
Parts for Fuze, B.D., M58	H & H Screw Products Mfg.Co., N. Providence, R. I.	W-241-ORD-344-Cohn & Rosenberger P.O. 23125	Boston Ordnance District	126,400.00	8/11/42
Headspace and Timing Gages, Cal. .30 and Cal. .50 B.M.G. M2 AC	Hadley Special Tool Co., Boston, Mass.	W-852-ORD-9963	Springfield	131,524.24	3/31/42
Adapters, Belt, Cal. .30 B.M.G. M1919 A4	Hadley Special Tool Co., Boston, Mass.	W-852-ORD-10065	Springfield	562,009.80	3/15/43
#Pistol, Auto. Cal. .45, M1911 A1	Harrington & Richardson Arms Co., Worcester, Mass.	W-ORD-395	Chief of Ordnance	197,802.35	12/15/41
Pistol, Auto. Cal. .45, M1911 A1	Harrington & Richardson Arms Co., Worcester, Mass.	DA W-241-ORD-6	Boston Ordnance District	2,402,982.28	12/42
Grinding Equipment	Heald Machine Co. Worcester, Mass.	DA W-241-ORD -20	Boston Ordnance District	130,402.00	1/9/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Grinding Equipment	Heald Machine Co., Worcester, Mass.	DA W-241-ORD -50	Boston Ordnance District	$ 979,950.00	6/30/42
Machine Aluminum, Alloy Cast Plates for Tank, Medium	S. M. Howes Co., Taunton, Mass.	A-1960 Baldwin Loco. P. O. C-40012 -666-F	A.I.O. Baldwin Loco. Wks.	176,867.00	11/1/42
Machine Aluminum, Alloy Cast Plates for Tank, Medium	S. M. Howes Co., Taunton, Mass.	W-ORD-483 Baldwin Loco. P.O. C-40009-1497-F	A.I.O. Baldwin Loco Wks.	176,867.00	12/1/42
Fuze, P.D., M52 (Metal Parts)	Ind. Lock Co., Fitchburg, Mass.	W-241-ORD-302	Boston Ordnance District	965,000.00	1/31/42
*Lathes	Jones & Lamson Machine Co., Springfield, Vt.	DA W-241-ORD-75	Boston Ordnance District	172,512.00	5/31/42
Emergency Plant Facility	Jones & Lamson Machine Co., Springfield, Vt.	W-241-ORD-319	Boston Ordnance District	1,220,000.00	
Drilling Equipment	Kingsbury Mach. Tool Corp., Keene, N. H.	W-241-ORD-335	Boston Ordnance District	1,204,216.00	6/6/42
Cartridge Cloth, Grade E	Lonsdale Co., Providence, R. I.	W-672-ORD-3987	Picatinny	294,310.00	9/42
Ground Signals M20 and M21	Natl. Fireworks Inc., West Hanover, Mass.	W-241-ORD-308	Boston Ordnance District	665,632.00	5/42
Loading 2 Pounder Anti Tank Ammunition	Natl. Fireworks Inc., West Hanover, Mass.	DA W-241-ORD-5	Boston Ordnance District	1,500,000.00	6/43

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Ground Signal M17, M19, M20	Natl. Fireworks Inc., West Hanover, Mass.	W-241-ORD-348	Boston Ordnance District	$ 288,103.02	1/42
Shell, H. E. Streamline 6" Howitzer, Loading	Natl. Fireworks Inc., West Hanover, Mass.	DA W-241-ORD-110	Boston Ordnance District	231,600.00	1/42
Wooden Crates and Packing Mat. for 75 mm. H.E. ammunition	Natl. Fireworks Inc., West Hanover, Mass.	DA W-241-ORD-105	Boston Ordnance District	167,200.45	3/42
Load Shell, B.L.H.E. Streamline 5.5" MK. 1 D/L	Natl. Fireworks Inc., West Hanover, Mass.	DA W-241-ORD-147	Boston Ordnance District	627,900.00	2/43
*Fuze, Percussion, #231, MK III/L, Loading	Natl. Fireworks Inc., West Hanover, Mass.	DA W-241-ORD-163	Boston Ordnance District	470,400.00	
Plate, Top Assembly, C 76847 for Bayonet Scabbard, M3	New England Pressed Steel Co., Natick, Mass.	DA W-241-ORD-102, W-241-ORD-350, Beck with P. O. 5307	Boston Ordnance District	137,177.00	10/30/42
Grinding Machines	Norton Co., Worcester, Mass.	DA W-241-ORD-28	Boston Ordnance District	240,644.02	2/28/42
Grinding Machines	Norton Co., Worcester, Mass.	DA W-241-ORD-70	Boston Ordnance District	166,503.00	3/31/42
*Shot, A.P., 20 mm., M75 (Metal Parts)	Pantex Pressing Machine Co., Central Fall, R. I.	W-241-ORD-371	Boston Ordnance District	285,000.00	

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Lathes	Potter & Johnston Mach. Co., Pawtucket, R. I.	DA W-241-ORD-21	Boston Ordnance District	$ 194,785.00	3/19/42
Lathes	Potter & Johnston Mach. Co., Pawtucket, R. I.	DA W-241-ORD-25	Boston Ordnance District	179,284.00	6/30/42
Lathes	Potter & Johnston Mach. Co., Pawtucket, R. I.	DA W-241-ORD-124	Boston Ordnance District	538,910.00	6/30/42
Weldments for 90 mm. outriggers and bogie frame	Pullman Standard Car Mfg. Co., (Osgood Bradley Plant), Worcester, Mass.	W-952-ORD-4895	Watertown	178,500.00	5/2/42
Lathes	Reed Bros. Co., Inc., Beverly, Mass.	DA W-241-ORD -27	Boston Ordnance District	116,056.00	9/9/41
Milling Machines	Reed Prentice Corp., Worcester, Mass.	DA W-241-ORD -38	Boston Ordnance District	103,237.50	Completed
Lathes	Reed Prentice Corp., Worcester, Mass.	DA W-241-ORD -30	Boston Ordnance District	184,207.00	Completed
Lathes	Reed Prentice Corp., Worcester, Mass.	W-241-ORD-318	Boston Ordnance District	2,607,300.00	1/1/42
Lathes	Reed Prentice Corp., Worcester, Mass.	DA W-241-ORD-49	Boston Ordnance District	112,656.00	11/30/41
Lathes	Reed Prentice Corp., Worcester, Mass.	DA W-241-ORD-69	Boston Ordnance District	150,085.00	1/20/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Bands, Copper Driving for 7.2" B/L, S/L Shell	Revere Copper & Brass Co., Inc., New Bedford, Mass.	DA W-241-ORD -61	Boston Ordnance District	$ 364,100.00	6/42
*Cal. .30 Cartridge Case Cup, Cal. .30 Ball Bullet Jacket Cup, Cal. .50 Bullet Tracer Jacket Cup	Revere Copper & Brass Co., Inc., New Bedford, Mass.	W-271-ORD-577, Revere P. O. 103, 106, 111	Chicago Ordnance District	220,392.01	2/42
Cartridge Cloth, Grade E	R. I. Fabrics Co., Pawtucket, R.I.	W-672-ORD-3689	Picatinny	409,546.05	12/22/41
Cartridge Cloth, Grades C, D, E	R. I. Fabrics Co., Pawtucket, R.I.	W-672-ORD-4457	Picatinny	345,400.00	3/16/42
Lathes	Rivett Lathe & Grinder, Inc., Boston, Mass.	P.O.727-41-309 E. D.	Raritan	118,236.80	11/41
Data Transmission Systems, T18	Saco-Lowell Shops, Biddeford, Maine	W-314-ORD-10650	Frankford	6,439,500.00	8/42
Holder, Cartridge, Cal. .30 B.M.G. M1919 A4	Stevens-Walden Inc., Worcester, Mass.	W-852-ORD-10064	Springfield	1,033,106.25	4/42
Holder, Cartridge, Cal. .30 B.M.G. M1919 A4	Stevens-Walden Inc., Worcester, Mass.	W-852-ORD-9372	Springfield	126,272.00	12/31/41
Dies, Collets, and Punches	Stevens-Walden, Inc., Worcester, Mass.	DA W-241-ORD -19	Boston Ordnance District	174,688.35	2/1/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Emergency Plant Facility	Taft-Peirce Mfg. Co., Woonsocket, R.I.	W-241-ORD-305 W-241-ORD-338	Boston Ordnance District	$ 400,000.00 635,000.00	
Guns, 37 mm. M3 with extra parts	United Shoe Mach. Corp., Beverly, Mass.	DA W-241-ORD -1	Boston Ordnance District	1,265,680.50	7/42
Guns, 37 mm. M3 with extra parts	United Shoe Mach. Corp., Beverly, Mass.	W-241-ORD-325	Boston Ordnance District	1,928,275.95	10/31/42
Supplemental Parts for Guns 37 mm. M3 & M5	United Shoe Mach. Corp., Beverly, Mass.	W-241-ORD-324	Boston Ordnance District	128,514.88	4/21/42
Tubes for Gun, 37 mm. M4	United Shoe Mach. Corp., Beverly, Mass.	W-241-ORD-352	Boston Ordnance District	357,125.00	
Gun, 37 mm., M6	United Shoe Mach. Corp., Beverly, Mass.	W-241-ORD-357	Boston Ordnance District	160,251.40	
*Silk, Parachute, Pyrotechnic, Class A	U.S.Textile Weaving Corp., Central Falls, R. I.	W-241-ORD-364	Boston Ordnance District	119,000.00	3/42
#Fuze, Mech. Time, M43A1	Waltham Watch Co., Waltham, Mass.	W-ORD-425	Chief of Ordnance	356,085.00	6/13/42
Fuze, B. D. M58 (Metal Parts)	Waltham Watch Co., Waltham, Mass.	W-241-ORD-334	Boston Ordnance District	150,530.40	5/42
Shell, 3" A.A. M42 (Mach.)	S. A. Woods Mach. Co., Boston, Mass.	W-241-ORD-301	Boston Ordnance District	2,348,691.72	2/42

5. Current Procurement (continued)

(3) Current Inspection (Contracts over $100,000.00 in value.)

Item	Plant	Contract or Order No.	Ordnance Estab.	Value	Expected Completion Date
Shot, S.A.P., 75 mm. S.A.P., M72	S. A. Woods Mach. Co., Boston, Mass.	W-241-ORD-342	Boston Ordnance District	$1,696,400.00	6/42
*Booster, M20 (Metal Parts)	Wright Machine Co., Worcester, Mass.	W-241-ORD-368	Boston Ordnance District	187,200.00	5/42
Booster, M20 (Metal Parts)	Wright Machine Co., Worcester, Mass.	W-241-ORD-303	Boston Ordnance District	1,100,070.00	3/42

\# Educational Order
* Reported upon for first time

a. Number of Prime Contracts being inspected from all sources - Total 383

1. District	67
2. Arsenal	195
3. Defense Aid	117
4. Foreign	1
5. Chief of Ord.	3

b. Number of Sub-Inspection Requisitions - (Includes all Insp.-Req. not considered as Prime Contracts) - Total 649

1. Own District	53
2. Other Districts	429
3. Arsenals	132
4. Other Services (Air Corps)	1
5. Defense Aid	17
6. Foreign	17

c. Total number of all Inspection Requisitions and Contracts in force (a. & b.) - Total 1032

d. Number of Officers predominantly on inspection duties - 4

e. Number of Civilian Inspectors (all grades) - 304

5. Current Procurement (continued)

(3) Current Inspection (continued)

f. Number of administrative and clerical employees predominantly on inspection work - 24

6. Plant Protection Inspection

Plants assigned	169	
Plants selected by District for survey (not assigned)	6	
Total		175
Assigned plants covered by report of initial survey	154	
Reports submitted on other plants (not assigned)	6	
Total plants surveyed		160
Total plants resurveyed	24	

J. S. CRAWFORD
Lt. Colonel, Ordnance Department
Deputy District Chief

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San Francisco Ordnance District
Los Angeles Ordnance Region

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N. Ord. 4

IN REPLY ADDRESS
BUREAU OF ORDNANCE, NAVY DEPARTMENT
AND REFER TO No.
L4-3 (11)

(Pr6e)

NAVY DEPARTMENT
BUREAU OF ORDNANCE
WASHINGTON, D. C.

X on
378/Nos. 97123
Rough A
Conference
National Fireworks, Inc
Desk "Pr6e" (McDevitt)

3 June, 1942

MEMORANDUM

From: Pr6e
To : Files

Subject: Conference for negotiation of a supplies contract for the loading and assembling of 2-pounder ammunition, National Fireworks, Inc., West Hanover, Mass., contractor.

1. On 3 June, 1942 at 1030 a conference with held with the Bureau of Ordnance, the Bureau of Supplies and Accounts and the National Fireworks, Inc., West Hanover, Mass. Present at this conference were:

For the Bureau of Ordnance

Lt. (jg) C. F. Paul, Jr.
Lt. H. L. Mc Devitt
Lt. Comdr. T. Chatham

For the Bureau of Supplies and Accounts

Lt. Berger representing Pur. Div.
Mr. W. Browne Baker

For National Fireworks Inc.

Major Kaffke, plant manager at West Hanover, Mass.
Mr. G. Perkins
Mr. Willson

Lt. McDevitt: This conference has been called to negotiate a contract with the National Fireworks, Inc., West Hanover, Mass. for the loading and assembly of 2-pounder antiaircraft ammunition to fill the following Defense Aid requisitions in the following amounts:

U.K. 4021 for 1,000,000 rounds and
BAD 1039 for 2,000,000 rounds.

The company at the present time is loading and assembling 2-pounder ammunition in the amount of 1,000,000 rounds under an existing contract NOs-LL-97123, at a unit cost of $1.724 fixed price per round. The company has proposed to load the 3,000,000 rounds to fill the new requirements at unit costs as follows:

FOR VICTORY BUY UNITED STATES DEFENSE BONDS AND STAMPS

For loading, assembling and packing with pellets wrapped - $1.513
or with pellets unwrapped - $1.427

These prices are f.o.b. West Hanover, Mass.

061242 50148

10902495

Lt. Mc Devitt - con'd
The contractor has submitted the following proposal and breakdown of prices:

L4-3 (4)

June 2nd

"In accordance with your recent request, we are submitting the prices on loading, assembling and packing the subject ammunition. It is our understanding that furnished components and the necessary Cordite will be available in sufficient quantities to enable us to produce this ammunition at the rate of 500,000 rounds per month, and our costs have been so figured.

At the present time we are in the process of completing a British Contract for 1,000,000 rounds of this ammunition, but have been unable to complete this due to lack of components, which would indicate that our contract LL Nos-97123 with the U.S.Navy will not be completed in accordance with the delivery schedule and might be produced at a lower production rate than when originally estimated. It will, therefor, be important that the delivery of the furnished components be so arranged to enable us to produce at the rate of 500,000 rounds per month, if we are to attain the low cost operation, which is the basis of our lowered price.

We are pleased to quote as follows:

	Selling Price ea.
Loading, Assembling & Packing- "Pellets Wrapped"	$1.513
Loading, Assembling & Packing- "Pellets Not Wrapped"	$1.427

(The above prices are net f.o.b. West Hanover, Mass.)

Materials to be furnished and work to be done, to be the same as the conditions in our Contract LL N_os-97123.

We have built up our production line to a point where we can easily attain a production rate of 500,000 rounds per month and the delivery schedule that would apply to this quotation is dependent on that we receive the necessary components to complete the above mentioned contract which we have with you."

June 2nd, 1942

Loading, assembling and packing of 3,000,000 rounds of 2-pounder antiaircraft ammunition with #7 igniter (breakdown of above costs)

	Estimated Cost each pellet wrapped	Estimated cost each pellet not wrapped
Materials	$ .0753	$ .0742
Labor	.3083	.2853
Overhead (except on furnished components)	.5806	.5373
Handling, storage and Insurance furnished components	.1948	.1948
TOTAL	$ 1.1590	$1.0916
Waste, tests, rejects	.1090	.1026
Shipping Expense	.0280	.0280
Administrative expenses	.0998	.0942
NET PROFIT	.1173	.1106
NET SELLING PRICE	$1.5131	$1.4270

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Lt. Paul: How fully performed is that first contract?

24-3 41

Lt. Mc Devitt: The first contract is just about going into production. The company has proposed a production rate of 500,000 rounds per month. At present the Department has planned a production schedule of 200,000 rounds per month, however the Department hopes to be able to step its production rate to 500,000 rounds per month, this rate being dependent upon the Department's ability to secure a stepped-up production rate on the necessary components.

Lt. Paul: Is this job for 7 days per week, 3 shifts per day?

Mr. Willson: We could assume that. We always do that when we have enough stuff to work with.

Lt. Paul: What is production rate of original contract, and will it run simultaneously with this?

Lt. Mc Devitt: This contract will commence immediately upon completion of present contract.

Lt. Paul: Will your contract propose wrapped or unwrapped or will you have an alternative and decide as contract is performed?

Lt. McDevitt: At the present time the British Admiralty Technical Mission is investigating the advisability of loading with pellets unwrapped. The tests are being conducted at the proving range in Canada, and as soon as the results are obtained by the Department, a decision can be made.

Lt. Paul: Presumably the original contract price is based on the rounds with pellets wrapped?

Lt. Mc Devitt: Yes, thats right.

Lt. Paul: What are the recommendations of your Section. Do you feel that this price is fair and reasonable, with sufficient reduction for preliminary experiments.

Lt. Mc Devitt: Considering that the contractor has already had experience in loading these rounds through a previous contract with the British Purchasing Commission, it would seem to this section that the proposed price is fair and reasonable, since it represents a considerable reduction from the original unit price of contract NOs-LL-97123.

Lt. Paul: How do you feel about it, Mr. Baker?

Mr. Baker: Do you have any other contractors on this item so we can get a comparison?

Lt. Mc Devitt: No, the National Fireworks Inc. is the only contractor so far.

Mr. Baker: This represents a reduction in price from $1.724 on 1,000,000 to $1.5131 on 3,000,000 - it looks all right to me. This item of "waste, tests and rejects" is your percentage based on actual experience?

Mr. Willson: This is a lot lower than actual experience has indicated. The metal rejects are bad. We have a fuze screwed together and we have to take it apart and sometimes threw it away. We have been through a lot of headaches due to metal parts being in a bad condition. Labor costs $.10 to $.15 to tear a fuse down and it takes considerable time.

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Lt. Paul: That amounts to about 7%.

L4-3(11)

Mr. Kaffke: We take them apart and sometimes can't get them together again.

Lt. Baker: This is actually your experience to date, but you are hoping in this larger contract, to get the bugs out of the picture?

Mr. Willson: We have no control over the metal parts. We have been working since August 1941 on 1,000,000 for the British and have encountered one problem after another. We are hopeful that this will not happen on future contracts.

Lt. Berger: Is this price break down worked the same as price breakdown in connection with 20 mm. I notice your profit percentage seems to be a lot higher than it was on the 20 mm.

Mr. Willson: We have 5.5 - that was on a tremendous program; on this type ammunition it is tricky and we would have to have a little lee-way.

Lt. Berger: I notice you have shipping expense in here, doesn't requisition provide for delivery?

Mr. Willson: Yes, f.o.b. West Hanover, but we have to truck the raw material from the railroad line, then ship it over to storage building when completed until release for shipment is received, load metal boxes on truck to and from siding. It covers shippingfrom production line to storage and over to freight.

Lt. Mc Devitt: The company's plant has expanded so that to go from the railroad siding to the other side is quite a little distance.

Lt. Berger: What about facilities on this contract - are they yours?

Mr. Willson: They were purchased by British. We have added a lot to them of our own. When it first came up we applied to the Bureau but didn't hear from you and put them in ourselves.

Lt. Berger: Then they are a combination of your own and the British.

Lt. Paul: On this item of overhead and administrative expense, call you tell us what goes into administrative and what consists of overhead?

Mr. Willson: On the overhead, we have what is called factory overhead, supervisors, foremen, factory officers, production managers, technical staff, engineers, social security on those people as well as social security on direct labor. Maintenance and trucking are usually factory overhead items. On the handling, these 2-pounders are stored and preliminary operation is in our Whitman plant where we have a railroad siding and where we store components. We have a bank of $6,000,000 of components on which we have to carry full insurance, guard service, etc. We show that in two separate items. If the value of the components were added to this cost the percentage of profit would be around 1/2%. We handle these just as though they were our own and have to do everything on those.

Lt. Berger: That is the handling, storage and insurance charges.

Mr. Willson: That applies on them.

Lt. Berger: That is based on your former experience on former contracts.

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44-3 (11)

Lt. Berger: What about advance payment on this?

Mr. Willson: None on this contract - this will be a concurrent operation.

Lt. Paul: What about administrative expense?

Mr. Willson: Administrative expense consists of officers, general office, general accounting, auditing, etc.

Lt. Paul: It differs from the factory overhead of insurance and plant.

Mr. Willson: Yes.

Lt. Paul: Is everyone in agreement, for price appears to be fair and reasonable.

Mr. Willson: You can work out delivery schedule, knowing our capacity and knowing how the components will come in, you can figure it out yourselves. We can make them as fast asyou can shoot them to us.

Lt. Berger: You will probably base your requisition on former basis and either/or whether wrapped or unwrapped. Assuming that the contract is going to be for the wrapped pellets at the higher price we could state to the effect that we have under consideration plan accepting them unwrapped and in case they decide to accept them unwrapped the lower price should apply.

Lt. Mc Devitt: That will be all right.

Conference then adjourned.

H. L. McDevitt

HLMcD:AS

Copy to:
Pr2 (Lt. Paul)
Pr6LL
BuS&A (Lt. Berger, Pur. Div.)
BuS&A (Mr. W. Browne Baker)

061242 50148

400.171/550 NAT'L FIREWORKS INC. (ORDER PLACED FOR THE
(12-10-41) LOADING & ASSEMBLING OF INCENDIARY BOMBS)

Dec. 11/41-Nat'l Fireworks, Inc. West Hanover, Mass. The U.S. of America, acting thru the undersigned Contracting Officer, hereby places with you an order for loading and assembling of 35,000,000 incen. bombs, type AN-M54 & AN-M54X. Price per unit bomb, 45¢, f.o.b. storage area at contractor's plant and deliveries made in accordance with schedule outlined in this ltr. If this order acceptable to you, you will so indicate on hereon and on 2 copies attached, and return all 3 copies to this off before Dec. 15/41.

10902497

Encl 7

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PM370:KHR:VD
PM 9261081

September 26, 1942

FILED
SEP 28 1942
PLEASE RETURN
TO FILES
Office of Procurement and Materiel

Assignment Section
Price Adjustment Board
War Department
4-C Room 528 Pentagon Bldg.
Arlington, Virginia

Gentlemen:

We refer to your letter of August 3, 1942, to which was attached a list of contractors, Supplement "D", dated July 22, 1942. The Navy Department apparently has no contracts with the companies listed except for the following.

The Navy Department has supply contracts with the following companies but the interest of the War Department appears to be predominant and we, therefore, assume that the War Department Price Adjustment Board will conduct the investigation.

Easy Washing Machine Corporation
Sigmund Eisner Company
Electric Household Utilities Corporation
Fairforest Finishing Company
General American Transportation Corporation
Gisholt Machine Company
Hamilton Watch Company
Hobart Brothers Company
International Shoe Company
Jones & Laughlin Steel Corporation
Kilgore Manufacturing Company
Kohler Company
Koppers Company
Leach Company
LaBlond Machine Tool Company
Lights, Inc.
Link-Belt Company
McCord Radiator & Mfg. Company
Meeta Machine Company
Minneapolis-Moline Power Implement Company
Mullins Manufacturing Corporation

10902498

L1C-S COST INSPECTION SEPTEMBER 1942

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Walworth Company. This company has already been assigned to the Price Adjustment Board of the Navy Department for investigation.

Shell Oil Company, Inc. According to our records the Navy Department has supply contracts of $57,757,003 with this company as compared with a total of $24,368,000 with the War Department. In addition, the War Department has granted this Company facilities in an amount of $4,000,000. In view of this the Price Adjustment Board of the Navy Department will conduct the investigation.

Square D Company. This contractor is under investigation by the Price Adjustment Board of the Navy Department.

Tennessee Coal, Iron & Railroad Company. This company is a subsidiary of the U. S. Steel Corporation which is under investigation by the Price Adjustment Board of the Navy Department.

Texas Company. According to our records the Navy Department has supply contracts of $35,066,000 with this company as compared with a total of $8,510,000 with the War Department. The War Department, however, has granted facilities to this contractor in an amount of $4,250,000. In view of the above, please advise us whether you wish the Navy Department to conduct this investigation.

U.S.L. Battery Corporation. This company is a subsidiary of the Electric Auto-Lite Corporation, which is under investigation by the War Department Price Adjustment Board.

Yours very truly,

K. H. Rockey
Chairman
Price Adjustment Board

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C

Kasnik Manufacturing Company
National Acme Company
National Cash Register Company
National Stamping Company
Norwalk Lock Company
Omaha Steel Works
Pacific Mills
Pearless Woolen Mills
Pittsburgh Steel Company
Republic Steel Corporation
U. S. Pipe & Foundry Company
Utica Knitting Company
Waterbury Clock Company
Wellman Engineering Company
West Point Mfg. Company
William Whitman Company, Inc.
Lewis Young Spring & Wire Corporation
Sparks-Withington Company
J. P. Stevens & Company, Inc.
U. S. Slid Battery Corporation
Union Oil Company of California
United Engineering & Foundry Company
United Shoe Machinery Company
United States Hoffman Machinery Corporation

X Gilbert & Barker Manufacturing Company. This company is a subsidiary of the Standard Oil Company of New Jersey, which has been assigned to the Price Adjustment Board of the Navy Department for investigation.

X Marietta Manufacturing Company. This company has been assigned to the Price Adjustment Board of the Navy Department for investigation.

X National Fireworks, Inc. According to our records the Navy Department has supply contracts of $55,839,000 with this company as compared with a total of $22,565,000 with the War Department. In addition, the Navy Department has granted this company facilities of $5,627,000 as compared with $2,500,000 by the War Department. In view of this, the Price Adjustment Board of the Navy Department will conduct the investigation.

X Robertshaw Thermostat Company. This company is a subsidiary of the Reynolds Metals Company, which company has been assigned for investigation to the Price Adjustment Board of the Navy Department.

Citing English to Production Services
Section,
Industrial Services Division,
Bureau of Public Relations,
~~Feb~~ Feb, 1, 1944
(Aberdeen Proving ground)
Dept of Army

Citing English to Production Services
Section,
Industrial Services Division,
Bureau of Public Relations,
~~Feb~~ Feb. 1, 1944
(Aberdeen Proving ground)
Dept of Army

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[redacted]

NATIONAL FIREWORKS, INC.

★

FACTORY AND EXECUTIVE OFFICES

WEST HANOVER, MASSACHUSETTS

November 15, 1944

S78 (20mm)
Pr 6

Bureau of Ordnance
U. S. Navy Department
Washington, D. C.

112214 00406

Subject: Loading, Assembling and Packing 20 MM A.P.Tracer Ammunition Mark 10 Projectile at West Hanover Plant, West Hanover, Mass.

Enclosures: Two Copies of "Price Analysis" Form
Two Copies of Schedule "A"

Gentlemen:

As per your request to submit a proposal for loading of subject ammunition, we quote as follows:-

1. A. Load, Assemble and Pack 20 MM A.P.Tracer Ammunition Mark 10 Projectile .....@ $.155 per complete round

F. O. B. West Hanover, Mass.

This price is predicated on the use of formula No.131 tracer composition and the application of varnish on the brass tracer closing disc.

B. Special tools, dies, jigs and fixtures and installation of same $17,500.00 - See Schedule "A" attached. This amount has not been taken into consideration in the unit price stated in Item A.

2. Delivery schedule as follows:-

November	approximately	5,000 rounds
December	approximately	20,000 rounds
January and thereafter per month	approximately	250,000 rounds

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3. United States Navy to furnish:-

A. Materials

All metal components except Brass Closing Disc
Loaded Detonators and Primers
Ammunition Tanks and Fillers
Smokeless Powder
Barium Peroxide
Strontium Nitrate

B. Equipment

1. Two (Navy owned) Logansport Presses, complete with pumps, motors, etc., at our Chillicothe, Ohio Plant, Tag Nos. NAC-H4 G & H. See our letter of October 24, 1944.

2. One (Navy owned) Binks Dual Paint Machine complete, at our Chillicothe, Ohio Plant, Tag No. NAC-H-66 E & F.

F. O. B. West Hanover, Mass.

4. National Fireworks, Inc. to furnish all other chemicals and materials including Brass Closing Discs, Magnesium Powder and Chipboard Packing Tubes.

We anticipate the loading of the first 5,000 rounds by hand methods and the delivery schedule from there on is contingent upon receipt of the Logansport Presses and Binks Dual Paint Machine.

We anticipate your acceptance of the above proposal and that we will be awarded a contract accordingly.

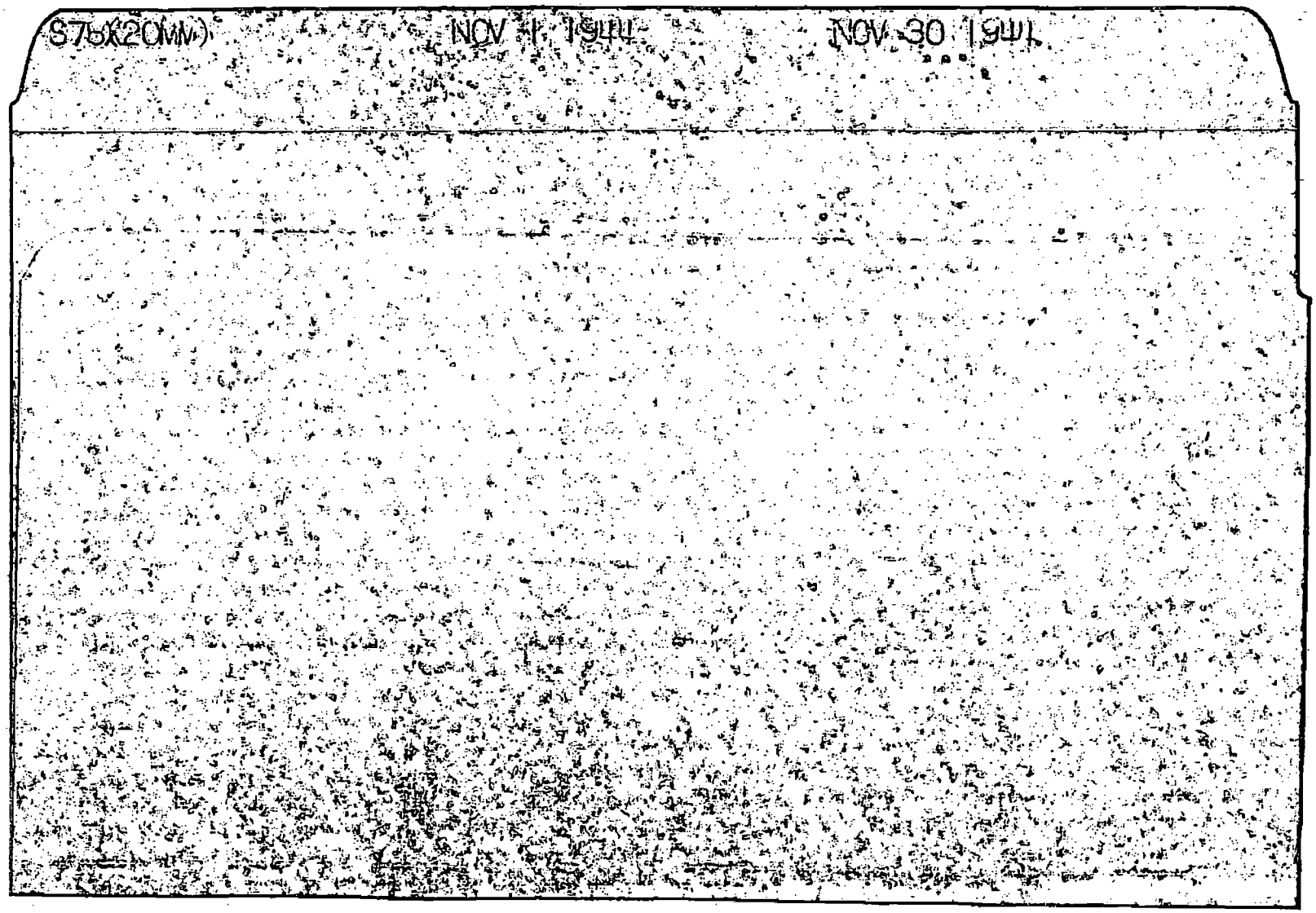
Very truly yours,

NATIONAL FIREWORKS, INC.

R. G. Braznor
R. G. Braznor

RGB/aff

NATIONAL FIREWORKS
NARA II, COLLEGE PARK, MD
RG 74 BUREAU of ORDNANCE
Entry 25V General Correspondence, Restricted, 1944
Box 549 S78(REAN 521) to S78(20mm) Oct. 1



REPRODUCED AT THE NATIONAL ARCHIVES

160/2065 NATIONAL FIREWORKS, INC. (PREFERENCE RATING APPLICATION)

Apr.25/42- 1st P. D. Subject Preference Rating Applications, National Fireworks, Inc. This Co. requires additional capital equipment at West Hanover, Mass., Cordova, Tenn., and Mays Landing, New Jersey in order to complete contract #1502-CMS-332 which covers the assembly of 35,000,000 incendiary bombs valued at $18,780.00, completion on April, 1943. We enclose for your review, countersignature and disposition certificates M-119345, M-119350, M-[illegible], M-[illegible]; M-[illegible]; M-[illegible]; M-[illegible]; M-[illegible] and M-119347.

160/2065 NATIONAL FIREWORKS INC (SUPPLIES FOR PALMER)

Apr.24/42-1st P.D.fwd.ltr.from1st P.D.Subj. Supplies for
1st Ind. National Fireworks,Inc.Plants at Cordova,Tenn.
May 1/42 and Mays Landing,N.J.Based on accepted construction schedules,National Fireworks have given me a memo.of the components and other materials they will require for their bomb loading schedule. Attaching a copy of this memo.for the Cordova plant.Informed that the Mays Landing plant will require 50% of this material.IN bothe cases the initial date should be advanced to May 15.

10902502

160/2085 NATIONAL FIREWORKS, INC. (CONCERNING RAIL FOR INCENDIARY BOMB PLANT)

Apr.1/42 National Fireworks Inc; Cordova, Tenn. This is with ref. to your ltr. of March 16th to the Priorities Div. of this office. Attention: Capt. Leggin, concerning rail for the Incend. Bomb Plant. This will confirm our advice of April 1 that arrangements have been made by WPB to release the necessary rail, switches, eddg. for installation of siding at the Cordova, Plant.

160/2095 NATIONAL FIREWORKS INC. (PREFERENCE RATING FOR

May 9/42-1st P.D. Subject: Preference Rating for National Fireworks, Inc. We enclose Pd-3A, M-418433, in quintuplicate, with PD-2O, in duplicate, requesting priority authority on Safety Shoes valued at $3,084.00 required by National Fireworks, Inc. New plant at Cordova, Tenn is nearing completion and the Safety Shoes are an essential part of the plant protection equipment in that no nails are used in their construction and all workers in the magnesium assembly are thus protected from the possibility of creating a spark. As the del.date is 5-20-42, this of. will appreciate your early action.

10902507

800.1/10-B NATIONAL FIREWORKS, INC. (APPLICATION TO SERVE, MEMPHIS LIGHT, GAS & WATER DIV.)

May 28/42 Memphis Light, Gas & Water Div. Memphis, Tenn. We are mailing today attn. of Mr. J. A. Krug, WPB, Wash. DC. our new and revised application to serve the National Fireworks, Inc. Cordova, Tenn. with a power connection utilizing an installation of three 333 Kva, 7200/2400 Volt transformers. We have been inf. their power requirements will be 265 HP for the 20 millimeter plant and 590 Hp for the incend bomb plant.

160/2088 NAT'L. FIREWORKS, INC. (CONTRACT W 1302 CWS-332, PREFERENCE RATING H-418618 FOR RATIO-MOTORS)

May 28/42-1st P.D. Subj: Preference Rating for Ratio-motors, National Fireworks, Inc.
We enclose herewith PD-3A, H-418618, Contract W-1302-CWS-332, covering 18 Ratiomotors, value $2,540.00, required by National Fireworks Inc., for West Hanover, Mass; Cordova, Tenn; and May's Landing, New Jersey. These are formulated in accordance with Priorities Instructions No. 3, Paragraph 10, (h) (i), for your approval, countersignature, disposition, and distribution.

10902508

REPRODUCED AT THE NATIONAL ARCHIVES

400.171/550 (Incend). NATIONAL FIREWORKS, INC. (TRANSFORMER BANKS)

June 9/42-ECMPD-Subj: Transformer Banks for National Fireworks, Inc., Cordova, Tenn. Natl Fireworks, Inc. is completing the construction of plant at Cordova, Tenn. which will form an important part of the 20mm Shell Program & of the Incend. Bomb Program. The Memphis Light, Gas & Water Div., Memphis, Tenn. has already installed 3 200 KVA transformers which will supply adequately the 20mm plant. The application has been carefully reviewed by this office & it is recommended that 3 333 transformer banks be installed & that application on Form PD-36 be approved.

10902509

463.1/48 NATIONAL FIREWORKS,INC. (POWER SUPPLY: CONSERVATION OF CRITICAL MATERIALS).

June 18/43-1st P.D.Subj:OWS Files 463.1/48;Power Supply; Conservation of Critical Materials. This office desires expeditious action on an application now pending before Mr.J.A.Krug,Power Branch,WPB, Wash.DC.,which covers transformers and power connections fr.Memphis Light,Gas & Water Div., Memphis,Tenn.to the immend.bomb plant,National Fireworks,Inc.Cordova,Tenn. We attach herewith a copy of the listed letters.

10902510

520/A64 NATIONAL FIREWORKS, INC (USE OF INLAND WATER WAYS)

June 9/42-1st P.D. Subj: Use of Inland Water Ways. Re your ltr of 6/5, relative to use of inland waterway routes to territory specified. Thar has been a movement of Serv. Masks fm Firestone Rubber & Latex Products Co. & incond fm. Nat'l Fireworks Inc. Consigned to Supply Officer, Memphis General. This ofc has not the facilities for checking the rate feature involved in a joint movement fm points specified to Memphis Tenn. for delivery via Inland Waterway Cargos this info. as to movements fm this area is extended to you as a matter of info. However we would still have to adhere to reoutings furnished by the ofs of QMG.

10902511

REPRODUCED AT THE NATIONAL ARCHIVES

400.171/550 Incend. NATIONAL FIREWORKS CO.(RE:M54 METAL COMPONENTS SHEDULED TO)

May 18/42-1ST.P.D. TT W-651-ord, RE M54 METAL COMPONENTS SCHEDULED TO NATIONAL FIREWORKS.DIVERT 900,000 SCHEDULED TO WEST HANOVER PLANT TO CORDOVA TENNESSEE PLANT & 2000,000 TO MAYS LANDING, NJ PLANT FROM AVAILABLE STOCKS.NOTIFY THIS OFFICE AMOUNTS & FROM WHAT PO'S THEY ARE DIVERTED. DIRECT REPLY TO LT. ALSTON.

400.171/552 Incend. (5-18-42) NATIONAL FIREWORKS CO.(M54 BOMB COMPONENTS)

May 18/42-2nd P.D. Subj: M54 Bomb Components for Cordova and May's Landing, National Fireworks plants in Cordova, Tenn and May's Landing, N.J. are now ready to load. N.Y.District is shipping components to National Fireworks at West Hanover, Mass. From the amounts scheduled to Nat.Firework at West Hanover, divert the components in amounts indicated below to the new plants. Notify this office at once of the action taken on each component and the Proc.Orders affected.
The list is as follows:

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REPRODUCED AT THE NATIONAL ARCHIVES

400.12/375 NATIONAL FIREWORKS. (M 200 A-1 FUSES)

AUG.12/42-1ST P.D. TT W-866-3-2A. RE M200 A-1 FUSES. DIVISION HAS BEEN MADE TO LOAD FUSES AT NATIONAL FIREWORKS, WEST HANOVER PLANT RATHER THAN CORDOVA. PO IS BEING AMENDED ACCORDINGLY. ADVISE ADJUSTED PRICE. DIRECT REPLY TO MAJ. OLSSON.

400.171/550 (Incend) NATIONAL FIREWORKS (AMENDMENT FOR P.O. 770-42)

Aug 12/42-1st P.D. Subj Amendment for PO 770-42. Washington TT W-725-3-2A, 8/11/42 advised to ship 200 gallons NRS Compound to National Fireworks, Cordova, Tenn. This material was shipped from Contract CWS 470PO 770-42. It is requested that subject PO be amended as to shipping instructions only.

400.171/553 NATIONAL FIREWORKS CO. (SHIP PETTMAN CEMENT TO,)

AUG.11/42-3RD P.D. TT W-724-3-2A. SHIP 100 GAL. PETTMAN CEMENT TO NATIONAL FIREWORKS, CORDOVA, TENN. PO BEING AMENDED TO COVER.

400.171/560 Incend. NATIONAL FIREWORKS CO. (NRC COMPOUND TO,)

AUG.11/42-1ST P.D. TT W-725-3-2A. SHIP 200 GAL. NRC COMPOUND TO NATIONAL FIREWORKS, CORDOVA, TENN. PO BEING AMENDED TO COVER.

10902522

400.171/552 Incend. NATIONAL FIREWORKS CO. (SHIPMENT OF M3 BOXES & CLUSTERS TO CORDOVA & MAY'S LANDING)

May 28/42- 2nd P.D. SUBJ: Shipments of M3 Boxes and Clusts to Cordova and May's Landing. Request 2nd P.D. be allowed to furnishe the M3 boxes and M3 Clusters reqd for packaging of 4#-M54 bombs, to be produced at May's Landing and Cordova plants of Mat'l Fireworks Co. Request is made in order to alleviate a storage condition, existing on the two items.

400.171/552 NATIONAL FIREWORKS INC. (PO 728-42)
(Incend)

May 26/42-2nd. PD-TT W-100-3-2. RE UR TT MY 5-376-S.
NATIONAL FIREWORKS INC., CORDOVA, TENN.
NATIONAL FIREWORKS INC., MAYS LANDING. N.J.
BOTH FOR USE ONPO 728-42.

10902513

400.172/552 Incend. NATIONAL FIREWORKS. (M54 BOMB COMPONENTS FOR CORDOVA & MAY'S LANDING)

June 23/42-HY-CWPD. SUBJ:-M54 Bomb-Components for-Cordova and-May's Landing,GWS 400.172/552-Incend.- Para. #2,our ltr. 6/18/42, on same subj., following is a report of shipments made on items 7,8,9 & 10:A.Sulfur,Grade B-8,700 lbs. ship. to Nat'l. Fireworks,Cordova,Tenn., 3,500 lbs. to Nat'l.Fireworks,May's Landing,NJ. REQST.THOSE AMNTS.BE DEDCTD.,FRM. AMNT.originally schdled.for West Hanover,Mass. and P.O.12 79-42 be amended accord.B.Castor Oil,2,895 lbs. to Nat'l.Fireworks,Cordova,Tenn.1,050 lbs.to National Fireworks,May'Landing, N.J. c.LISTED:

10902514

400.12/373 NATIONAL FIREWORKS (P.O. 10034-43)
(7-15-42)

July 7/42-1st P.D.,P.O.10034-43.Type II. Procure 68,000 lbs.,Nails,6d,cement coated,smooth box nail,zinc steel wire. Code 20 Priority A-1-a First Half " A-1-d Sec.half.
(AWSB approval 7/1/42;18-C-13,"LWR")
Ref: 43
Spec. FF-N-101,amt.3. Ship to: Natl.Firework, West Hanover,Mass. Natl.Fireworks,Scrocve,Texas P.B.A. in 10 equal monthly increments.

10902515

400.12/373 (6/20/42) NATIONAL FIREWORKS (P.O. 3012-42, AMEND #1)

July 16/42-1st P.D.Amend.#1.PO 3012-42 Type II. Amend order as to shipping instructions Only:
(a) 8,000,000ea.Container Assembly,
(b) 8,000,000 ea.cover
(For M-14 Incendi Grenade Code 20 Priority A-1-C. Ship to: Natl.Fireworks,West Hanover Mass. PO 10085-43 as req'd. Natl Fireworks, Cordova,Tenn. PO 10005-43 as req'd, P.B.A. NO 4001-43 as req'd. in 10 equal monthly increments.

400.171/775 Incend. NATIONAL FIREWORKS (CLUSTERING METHOD)

July 13/42-Atlanta P. D. TT (T-721-3-2).
"NAT'L FIREWORKS HAVE REQUESTED THAT THEY BE ALLOWED TO USE SAME CLUSTERING METHOD AT CORDOVA AS THEY USED AT WEST HANOVER. THIS IS APPROVED AS LONG AS SATISFACTORY CLUSTERS RESULT. NEW SPECIFICATION FOR THERMATE W 1ST FIRE MIX, THAT IS SPEC. 196-131-92, WILL BE USED. THIS REQUIRES THE BODY TO BE WELL VENTED."

10902516

323/320 NAT'L. FIREWORKS, INC. (E.A. GIVEN AUTHORITY TO SHIP COMPLETE SET OF GAGES FOR M50 INCENDIARY BOMB TO)

July 20/42-RA TT M-1186-3-5 THIS IS YOUR AUTHORITY AND INSTRUCTION TO SHIP ONE COMPLETE SET GAGES FOR M50 INCENDIARY BOMB TO NATIONAL FIREWORKS INCORPORATED CORDOVA TENNESSE. ADVISE THE ATLANTA CWPD WITH COPY TO THIS OFFICE WHEN SHIPMENT WILLBE MADE. ALSO ADVISE ANY MISSING GAGES TO COMPLETE SET SO ARRANGEMENTS CAN BE MADE FOR THEM TO BE SHIPPED FROM ANOTHER DISTRICT.

10902517

400.12/373 NATIONAL FIREWORKS, INC. (P.O. #10,014-43 AMEND. # 2)

Aug 10/42 B-CWPD. Subj: P.O. 10,014-43, Amend. #2. This District has already shipped 715 Gals. oil in 55-gal.drums to the following destinations:
275 Gals to Nat'l Fireworks, Inc., W.Hanover, Mass
275 " " " " Cordova, Tenn.
165 " " P.B.A., Pine Bluff, Ark.
This office is in doubt as to the proper procedure as to cancellation of amounts to Cordova & P.B.A.

400.771/552 NATIONAL FIREWORKS, INC. (P.O. 1397-42)

Aug.10/42- 1st.P.D. Subj: National Fireworks, Inc. P.O. 1397-42. The New York CWPD has awarded 7,584 pounds of Pettman Cement on P.O. 1397-42. Shipmts. are to
National Fireworks, Inc., West Hanover, Mass.
National Fireworks, Inc., May's Landing, N.J.
National Fireworks, Inc., Cordova, Tennessee.
Request quantities to be shipped to each destination.

160/2085 NATIONAL FIREWORKS, INC. (SHIPPING LIST, CONTRACTS 31302 CWS 317 & 332)

Aug. 10/42-B-CWPD.SUBJ:Shipping List National Fireworks, Per TT W651-3-2 dated 5/18/42, and ltr. OC/CWS, 5/20/42, CWS 400.171/550 Incend., encl. list of shipments to Cordova, Tennessee and May's Landing, N. J. All items LISTED were originally scheduled to be used on Contracts 31302 CWS 317 and 332, P. O. 695-42 and 728-42.
31302 cws 317 Nat'l Fireworks, Ind, 160/1 Incend
31302 cws 332 " " " 160/2085

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400.12/373 NATIONAL FIREWORKS, INC. (P.O.#10,014-43 AMEND.# 2)

Aug 10/42 B-CWPD. Subj: P.O. 10,014-43, Amend. #2. This District has already shipped 715 Gals. oil in 55-gal.drums to the following destinations:
275 Gals to Nat'l Fireworks, Inc., W.Hanover, Mass
275 " " " " " Cordova, Tenn.
165 " " P.B.A., Pine Bluff, Ark.
This office is in doubt as to the proper procedure as to cancellation of amounts to Cordova & P.B.A.

400.771/552 NATIONAL FIREWORKS, INC. (P.O. 1397-42)

Aug.10/42- 1st.P.D. Subj: National Fireworks, Inc. P.O. 1397-42. The New York CWPD has awarded 7,584 pounds of Pettman Cement on P.O. 1397-42. Shipmts. are to
National Fireworks, Inc., West Hanover, Mass.
National Fireworks, Inc., May's Landing, N.J.
National Fireworks, Inc., Cordova, Tennessee.
Request quantities to be shipped to each destination.

160/2085 NATIONAL FIREWORKS, INC. (SHIPPING LIST, CONTRACTS 1302 CWS 317 & 332)

Aug. 10/42-D-CWPD.SUBJ:Shipping List National Fireworks, Inc. Per TT W651-3-2 dated 5/18/42, and ltr. OC/CWS, 5/20/42, CWS 400.171/550 Incend., encl. list of shipments to Cordova, Tennessee and May's Landing, N. J. All items LISTED were originally scheduled to be used on Contracts 1302 CWS 317 and 332, P. O. 695-42 and 728-42.
1302 CWS 317 Nat'l Fireworks, Ind, 160/1 Incend
1302 CWS 332 " " " 160/2085

400.12/373 NATIONAL FIREWORKS, INC. (P.O.#10,014-43 AMEND.# 2)

Aug 10/42 B-CWPD. Subj: P.O. 10,014-43, Amend. #2. This District has already shipped 715 Gals. oil in 55-gal.drums to the following destinations:
275 Gals to Nat'l Fireworks, Inc., W.Hanover, Mass
275 " " " " Cordova, Tenn.
165 " " P.D.A., Pine Bluff, Ark.
This office is in doubt as to the proper procedure as to cancellation of amounts to Cordova & P.D.A.

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National Fireworks, Inc., West Hanover, Mass.
National Fireworks, Inc., May's Landing, N.J.
National Fireworks, Inc., Cordova, Tennessee.
Request quantities to be shipped to each destination.

160/2085 NATIONAL FIREWORKS, INC. (SHIPPING LIST. CONTRACTS 1302 cws 317 & 332)

Aug. 10/42-D-CWPD.SUBJ:Shipping List National Fireworks, Per TT W651-3-2 dated 5/18/42, and ltr. OC/CWS, 5/20/42, CWS 400.171/550 Incend., encl. list of shipments to Cordova, Tennessee and May's Landing, N. J. All items LISTED were originally scheduled to be used on Contracts 1302 CWS 317 and 332, P. O. 695-42 and 728-42.
1302 cws 317 Nat'l Fireworks, Inc. 160/.1 Incend
1302 cws 332 " " " 160/2085

10902520

400.171/552 Incend NATIONAL FIREWORKS (GRAINED ALUMINUM FOR,)

June 17/42- 2nd P. D. Subject: Grained Aluminum for National Fireworks, Cordova, Tenn. This district is in receipt TT from Atlanta P.D. "CWS Plant Representative at National Fireworks Cordova advises there has been no grained aluminum received to date. Plant is threatened with delay in starting date. Please advise."Ref. made your ltr this P.D. 5-18-42 subj:M54 Bomb Components for Cordova and May's Landing,file number CWS 400.171552 and 1st Ind. thereto, 5-23-42. No further cor respondence has been rec with regard to ship ment of Grained Aluminum to Cordova.

10902521

NATIONAL FIREWORKS,(DISPOSITION OF MATERIALS).

July 19/42-Atlanta (WPB) Subj Disposition of Materials.
The uncompleted portion of the 110,000 AN-M54
and AN-M54A bombs which were to have been loaded
at Huntsville will be transferred to Natl Fireworks
Cordova, Tenn. and added to the 500,000 bombs whic
are to be loaded there. There will be 52,08[illegible] bombs
Available xcomponents at Huntsville will be fwded
and any other items which are required to fill
out this amount fwill befwded from other districts

10902523

Kent
EXHIBIT NO. 11
7-17-97
MICHELLE SYLVIA

COMMONWEALTH OF MASSACHUSETTS

IN THE MATTER OF THE NATIONAL FIREWORKS SITE

AFFIDAVIT OF EDMUND H. KENT

I, Edmund H. Kent, having been duly sworn, hereby make the following affidavit of my own personal knowledge:

1. I am a resident of the Commonwealth of Massachusetts and currently reside at 215 Williston Road, Sagamore Beach, Massachusetts.

2. I am 74 years old, and am currently retired.

3. I received a bachelors degree in chemistry from the University of Rhode Island in 1938.

4. I was employed for nearly thirty years at, and am familiar with, the property and associated manufacturing facilities commonly known as the National Fireworks Site ("the Site") located in Hanover, Massachusetts.

5. In July 1988, I returned to the National Fireworks site with representatives of the Environmental Protection Agency, Town of Hanover, Susquehanna Corporation and others in connection with environmental investigations of the Site. Thus, I am familiar with the condition of the Site prior to the recent removal work by Susquehanna Corp.

6. I began working at the Site on about February 15th of 1940 or 1941. At that time the Site was owned and

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operated by National Fireworks, Inc. Subsequently, the Site, or portions of it, were owned and operated by National Fireworks Ordnance Corporation and National Northern Corporation. All three of the "National" companies were related to each other and owned by essentially the same group of people. Later, the Site was owned and operated by American Potash and Chemical Company, Atlantic Research Corporation and The Susquehanna Corporation. Although several different companies were involved in the ownership and operation of the Site, the operation of the various manufacturing facilities was continuous. Changes in ownership or corporate structure did not cause changes in operations or manufacturing personnel.

7. I was continuously employed at the Site until 1970, except for a period of one to two years during the late 1940s when I worked at the New Bedford plant of Clark-Babbitt Industries (a company owned by the principal owners of National Fireworks, Inc.).

8. During my tenure, I held a variety of positions with the various entities that owned the Site, sometimes performing work for more than one of them simultaneously. I originally was hired as a chemist in the chemistry laboratory, which was under the auspices of the engineering department (serving all of the "National" companies), and became chief chemist in 1943 or 1944. I subsequently worked as an engineer and was involved in preparing cost estimates for bids on U.S. government munitions contracts. I was plant manager of the

Hanover facility from about 1955 until the mid-1960s. I also worked in the sales area. As part of my various job responsibilities I became very familiar with the production of the various munitions and other products produced at the Site. I also am very familiar with the wastes that were produced during those manufacturing operations and the disposal of those wastes.

9. Various types of munitions were manufactured on the Site for the United States military, including the Department of the Army, the Department of the Navy, the Air Force, and the Chemical Corps, either under direct military contracts, or under subcontracts to other private companies which were, in turn, fulfilling military contracts. This manufacture of munitions for the U.S. military started in late 1941 or early 1942 and continued through the late 1960s. The munitions manufactured for the U.S. Armed Forces on the Site over the years included 20 millimeter shells (the plant's major product during World War II) 20 millimeter tracer ammunition, 60 millimeter illuminating rounds (M-112), various types of detonators (manufactured on site from the early 1940s until the late 1960s), bouchon fuses for hand grenades, incendiary grenades (manufactured on site during the Vietnam War), primers, igniters, rocket igniters, M1-A1 squibs (used to ignite rockets, and manufactured on site through the early 1950s), pop-up explosive charges for anti-personnel mines, "Gravel" non-metallic land mines (manufactured on site from the

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late 1950s until 1967), dispenser cannisters for C-S gas (manufactured on site from the 1950s until approximately 1967), tetryl explosive pellets (manufactured on site from the early 1940s until the late 1960s), MOX explosives (manufactured on site in the late 1950s), and flame thrower cartridges.

10. Munitions were manufactured at various locations on the Site. For example, 20 millimeter shells, MK-125 primers, detonators, pop-up explosive charges, and 60 millimeter illuminating rounds were manufactured in Building 307, which was located in the southwestern portion of the Site. Building 307 was originally designed and constructed for loading explosive pellets into 20 millimeter shells. It was used for that purpose from the early 1940s until the late 1960s, including the period from 1950 through 1957, during which it was also used for the manufacture of other types of munitions. Buildings 304 and 305 were used for manufacturing tetryl explosive pellets which were used in the production of 20 millimeter projectiles. The control laboratory -- where the United States Army chemist worked -- was housed in Building 295. The Army chemist had an office there, as was required by Army contracts. The research and development laboratory was located in Building 40. Among other things, experimental flares for the Navy were developed there. During the 1940s and 1950s, thousands of pounds per day of magnesium powder for U.S. Army tracer ammunition were manufactured in a line of buildings near Winter Street. Squibs were made in the "Fox Island" area

and in buildings 27 and 264. MOX explosives were also made in Fox Island. Detonators and C-S gas cannisters were made in buildings 80 and 82. The "Gravel" land mines were manufactured in Building 85 and others. Explosives and off-specification products containing explosives from the manufacturing activities from all buildings on the site, including Building 307, were disposed of on site by burning or detonation. The generation and disposal of wastes was continuous throughout the entire manufacturing period, including the period from 1950 through 1957.

11. Wastes resulting from the various manufacturing operations and off-specification materials, including black powder and lead azide, a highly sensitive primary explosive, and other types of explosives, were disposed of at the Site. Wastes generated off the Site also were transported to the Site for disposal.

12. Branches of the United States military -- the Army, the Navy, the Air Force and the Chemical Corps -- were extensively involved in the manufacturing operations on the Site. The federal government supplied many of the explosives and other materials, such as tetryl, smokeless powder and black powder, that were sent to the Site for incorporation into various munitions. The government regulated and accounted for all explosives which it shipped to the Site. The explosives were incorporated into the various munitions produced at the Site according to government specifications. The Army, Navy,

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Air Force and Chemical Corps controlled and took delivery of virtually all munitions manufactured at the Site. The government also directed that any unused explosives be returned to the government or be disposed of.

13. Through its contracts and its on-site inspectors, the government directed that all off-specification products on the Site, including those containing explosives owned by the government, be disposed of on the Site. Burning was the preferred method, but detonation was used as well. Most of those materials were burned or detonated in designated disposal areas, after having been collected in a holding area. For example, the area commonly known as the "burning trenches" was used for the disposal of waste materials. Those wastes were spread in rows and ignited. Other wastes, including lead azide, were placed in containers and detonated in Lily Pond.

14. Federal governmental personnel were on site at nearly all times during the production of munitions. The following are a few whose names I remember. Mr. Marshall Heanault[1] was the chief resident inspector for the Army from early in World War II until the mid-1960s. He was stationed full-time at the Site, and served as an inspector not only for the Army but also for the Navy and Chemical Corps. He had his own office on the Site, and had several other government inspectors working under him. He spent much of his time

[1] This and other names are spelled phonetically, based on the affiant's best recollection.

filling out government quality control forms for products manufactured on the Site. In the mid-60s, Mr. Heanault was replaced by another Army inspector, who also had several assistants working under him.

15. The Chemical Corps also had resident inspectors stationed on the Site to oversee the production of various chemical warfare items, including magnesium bombs and napalm bombs. One such inspector was Major Chenery Salmon, who was on the Site during World War II. Mr. Henry Walliczynski was stationed in Building 295 during World War II as the U.S. Army Chemical Ordnance Inspector. Mr. Al Durant was also an on-site chemical warfare inspector for the government. The Navy and Air Force stationed inspectors on the Site to oversee production of the "Destructor" underwater mine during the Vietnam War. In general, at least one inspector from the federal government was on site at all times. At the heights of production during World War II and during the Vietnam War, there were often over a dozen inspectors on site at once. During the Army's "Gravel" mine program in the 1950s and 1960s, there were as many as 18 to 20 federal government inspectors on the Site. The federal government also had a chemist stationed at the Site during most of the time while I was employed there.

16. The various inspectors checked dimensions, other characteristics, and performance of munitions, witnessed loading procedures of explosives into the various munitions, ordered and witnessed tests of samples, and had the express

power and authorization to stop production at any time. The inspectors also would order, oversee, and report on the on-site disposal of off-specification products containing explosives such as lead azide. They rejected off-specification munitions, condemned them for disposal, and directed that they be disposed of on site. On a periodic basis the military sent additional personnel to the Site to supervise destruction and/or disposal of wastes.

17. The events and the manufactured products mentioned in this affidavit cover a thirty-year period (1941-1971) and are recollected to the best of my ability.

Signed:

E. H. Kent

EDMUND H. KENT

Date: October 10, 1989

Signed before me by Edmund H. Kent this 10th day of October, 1989 at Bourne (Buzzards Bay), Massachusetts.

Joyce M. Lindberg

Notary Public
Joyce M. Lindberg

My commission expires: September 7, 1995.

Kent
EXHIBIT NO. 2
7-17-97
MICHELLE SYLVIA

1

AFFIDAVIT OF EDMUND H. KENT

I, Edmund H. Kent, being first duly sworn, depose on oath as follows:

1. I was born on February 15, 1915, and currently reside in Sagamore Beach, Massachusetts.

2. I received a bachelors degree in chemistry from the University of Rhode Island in 1938.

3. I was formerly employed by National Fireworks, Inc., at the munitions and fireworks manufacturing facility in Hanover Massachusetts ("Facility") beginning on or about February 15, 1940 or 1941. Except for one or two years during the late 1940s, I was continuously employed at the Facility until the 1970s. During my employment at the Facility, all or portions of the Facility came to be owned by various other companies, including, National Northern Company, American Potash and Chemical Corporation, the Susquehanna Corporation, and Atlantic Research Company.

4. For one or two years during the late 1940s, I was employed by Clark-Babbitt Industries at their plant in New Bedford, Massachusetts.

5. I held a variety of positions at the Facility. From about 1943 or 1944 until about 1950, I was the chief chemist at the Facility. From 1950 until 1955, I was an engineer. As part of my responsibilities as an engineer, I prepared cost estimates for bids on United States government contracts. From 1955 to 1970, I was Plant Manager of the Facility. As a result of my experiences at the Facility, I am familiar with the manufacturing process, the products and wastes produced, and waste disposal at the Facility.

8. Mercury fulminate was a common primary explosive used predominantly during World War II. Lead azide was used predominantly during the Vietnam War era. Both mercury fulminate and lead azide were used only in the production of munitions for the U.S. government. The use of mercury fulminate significantly declined after World War II because the production of munitions that use mercury fulminate declined. Mercury fulminate was the only form of mercury used at the Facility during my employment. The use of lead azide significantly increased during the Korean and Vietnam Wars because the production of munitions, especially land mines, that use lead azide increased during that time.

9. The United States government supplied most of the explosives, and some other materials, used in manufacturing munitions, including black powder, freon-15, smokeless powder, and tetryl. The United States government regulated and accounted for all explosives that it shipped to the Facility.

10. The United States government required the munitions to be manufactured in accordance with government specifications.

11. At least twenty to thirty United States government inspectors were assigned to the Facility. During World War II, the Korean War, and the Vietnam War, inspectors worked at the Facility during each of three shifts each day. These inspectors checked the dimensions and performance of the munitions, witnessed the loading of explosives into the various munitions, and ordered and witnessed tests of samples. The number of government inspectors was fairly consistent during the above-named wars.

12. The inspectors had the express power and authorization to stop production at any time.

13. The government inspectors would order, oversee, and report on the on-site disposal of products containing explosives that they had determined did not meet the United States government's specifications. On a periodic basis, the United States government would send additional personnel to the Facility to supervise the destruction or disposal of wastes.

14. I observed that explosives and off-specification products containing explosives were disposed of at the Facility by burning or detonation. During my employment at the Facility, mercury fulminate was disposed of either by exploding it in Lily Pond or by spreading the mercury fulminate over a layer of sawdust on the ground, and then setting it on fire. Lead azide was disposed of by exploding it in Lily Pond or burning it on sawdust in the dump areas.

15. I observed that floor sweepings from the manufacturing areas were collected by the explosives crew and taken to burning pits where they were burned. Tailings and black powder would occasionally be burned in the disposal area.

16. General waste, including paper and cardboard, was collected daily and taken to the disposal area near Factory Pond.

Subscribed and sworn under the pains and penalties of perjury this 18th day of December, 1996.

Edmund H. Kent

COMMONWEALTH OF MASSACHUSETTS

Plymouth County December 18, 1996

Then personally appeared before me the above-named Edmund H. Kent, who swore that the above statements were true to the best of his knowledge and belief.

Phyllis J. Viera
Notary Public
My Commission Expires: 5/2/97

183901.b1

KENT
EXHIBIT NO. 1
7-17-97
MICHELLE SYLVIA

Issued by the
UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MASSACHUSETTS

SUBPOENA IN A CIVIL CASE

V.

CASE NUMBER:[1]

In the Matter of Verified Petition to Take Depositions to Perpetuate Testimony Regarding the Fireworks Site

TO: Edmund H. Kent

☐ YOU ARE COMMANDED to appear in the United States District Court at the place, date, and time specified below to testify in the above case.

PLACE OF TESTIMONY	COURTROOM
	DATE AND TIME

☒ YOU ARE COMMANDED to appear at the place, date, and time specified below to testify at the taking of a deposition in the above case.

PLACE OF DEPOSITION	DATE AND TIME
15 Williston Road, Sagamore Beach, Massachusetts	07/17/97 at 10:00 a.m.

☐ YOU ARE COMMANDED to produce and permit inspection and copying of the following documents or objects at the place, date, and time specified below (list documents or objects):

PLACE	DATE AND TIME

☐ YOU ARE COMMANDED to permit inspection of the following premises at the date and time specified below.

PREMISES	DATE AND TIME

Any organization not a party to this suit that is subpoenaed for the taking of a deposition shall designate one or more officers, directors, or managing agents, or other persons who consent to testify on its behalf, and may set forth, for each person designated, the matters on which the person will testify. Federal Rules of Civil Procedure, 30(b)(6).

ISSUING OFFICER SIGNATURE AND TITLE (INDICATE IF ATTORNEY FOR PLAINTIFF OR DEFENDANT)	DATE
Christopher P. Davis — Attorney for Petitioners	6/30/97

ISSUING OFFICER'S NAME, ADDRESS AND PHONE NUMBER

Christopher P. Davis, Esq., Goodwin, Procter & Hoar
Exchange Place, Boston, MA 02109 - Tel: (617) 570-1

(See Rule 45, Federal Rules of Civil Procedure, Parts C & D on Reverse)

[1] If action is pending in district other than district of issuance, state district under case number.

AO 88 (Rev. 1/94) Subpoena in a Civil Case

PROOF OF SERVICE

DATE	PLACE
SERVED 1:00 PM July 3, 1997	215 Williston Road Sagamore Beach, MA 02562
SERVED ON (PRINT NAME)	MANNER OF SERVICE
Edmund Kent	By leaving in hand with $40.00 witness fee and $0.00 travel fee = $40.00.
SERVED BY (PRINT NAME)	TITLE
Robert S. Barlow	Constable and a disinterested person

DECLARATION OF SERVER

I declare under penalty of perjury under the laws of the United States of America that the foregoing information contained in the Proof of Service is true and correct.

Executed on July 3, 1997
DATE

Robert S. Barlow
SIGNATURE OF SERVER

3 Cove Creek Lane - P.O. Box 276
Marshfield Hills, MA 02051
ADDRESS OF SERVER

Comment: Deposition is to be at his house so no travel allowance was tendered.

Rule 45, Federal Rules of Civil Procedure, Parts C & D:

(c) PROTECTION OF PERSONS SUBJECT TO SUBPOENAS.

(1) A party or an attorney responsible for the issuance and service of a subpoena shall take reasonable steps to avoid imposing undue burden or expense on a person subject to that subpoena. The court on behalf of which the subpoena was issued shall enforce this duty and impose upon the party or attorney in breach of this duty an appropriate sanction which may include, but is not limited to, lost earnings and reasonable attorney's fee.

(2) (A) A person commanded to produce and permit inspection and copying of designated books, papers, documents or tangible things, or inspection of premises need not appear in person at the place of production or inspection unless commanded to appear for deposition, hearing or trial.

(B) Subject to paragraph (d)(2) of this rule, a person commanded to produce and permit inspection and copying may, within 14 days after service of subpoena or before the time specified for compliance if such time is less than 14 days after service, serve upon the party or attorney designated in the subpoena written objection to inspection or copying of any or all of the designated materials or of the premises. If objection is made, the party serving the subpoena shall not be entitled to inspect and copy materials or inspect the premises except pursuant to an order of the court by which the subpoena was issued. If objection has been made, the party serving the subpoena may, upon notice to the person commanded to produce, move at any time for an order to compel the production. Such an order to compel production shall protect any person who is not a party or an officer of a party from significant expense resulting from the inspection and copying commanded.

(3) (A) On timely motion, the court by which a subpoena was issued shall quash or modify the subpoena if it

(i) fails to allow reasonable time for compliance;

(ii) requires a person who is not a party or an officer of a party to travel to a place more than 100 miles from the place where that person resides, is employed or regularly transacts business in person, except that, subject to the provisions of clause (c)(3)(B)(iii) of this rule, such a person may in order to attend trial be commanded to travel from any such place within the state in which the trial is held, or

(iii) requires disclosure of privileged or other protected matter and no exception or waiver applies, or

(iv) subjects a person to undue burden.

(B) If a subpoena

(i) requires disclosure of a trade secret or other confidential research, development, or commercial information, or

(ii) requires disclosure of an unretained expert's opinion or information not describing specific events or occurrences in dispute and resulting from the expert's study made not at the request of any party, or

(iii) requires a person who is not a party or an officer of a party to incur substantial expense to travel more than 100 miles to attend trial, the court may, to protect a person subject to or affected by the subpoena, quash or modify the subpoena, or, if the party in whose behalf the subpoena is issued shows a substantial need for the testimony or material that cannot be otherwise met without undue hardship and assures that the person to whom the subpoena is addressed will be reasonably compensated, the court may order appearance or production only upon specified conditions.

(d) DUTIES IN RESPONDING TO SUBPOENA.

(1) A person responding to a subpoena to produce documents shall produce them as they are kept in the usual course of business or shall organize and label them to correspond with the categories in the demand.

(2) When information subject to a subpoena is withheld on a claim that it is privileged or subject to protection as trial preparation materials, the claim shall be made expressly and shall be supported by a description of the nature of the documents, communications, or things not produced that is sufficient to enable the demanding party to contest the claim.

AFFIDAVIT OF EDMUND H. KENT

I, Edmund H. Kent, being first duly sworn, depose on oath as follows:

1. I was born on February 15, 1915, and currently reside in Sagamore Beach, Massachusetts.

2. I received a bachelors degree in chemistry from the University of Rhode Island in 1938.

3. I was formerly employed by National Fireworks, Inc., at the munitions and fireworks manufacturing facility in Hanover Massachusetts ("Facility") beginning on or about February 15, 1940 or 1941. Except for one or two years during the late 1940s, I was continuously employed at the Facility until the 1970s. During my employment at the Facility, all or portions of the Facility came to be owned by various other companies, including, National Northern Company, American Potash and Chemical Corporation, the Susquehanna Corporation, and Atlantic Research Company.

4. For one or two years during the late 1940s, I was employed by Clark-Babbitt Industries at their plant in New Bedford, Massachusetts.

5. I held a variety of positions at the Facility. From about 1943 or 1944 until about 1950, I was the chief chemist at the Facility. From 1950 until 1955, I was an engineer. As part of my responsibilities as an engineer, I prepared cost estimates for bids on United States government contracts. From 1955 to 1970, I was Plant Manager of the Facility. As a result of my experiences at the Facility, I am familiar with the manufacturing process, the products and wastes produced, and waste disposal at the Facility.

6. The Facility produced munitions for the U.S. military, beginning in late 1941 or early 1942, and ending in the 1960s. The primary product produced at the Facility during World War II was 20 millimeter shells. From the early 1940s until the late 1960s, tetryl explosive pellets and various types of detonators were manufactured at the Facility. From the early 1940s until the early 1950s, M1-A1 squibs, which were used to ignite rockets, were manufactured at the Facility. During the late 1950s, MOX explosives were manufactured at the Facility. From the late 1950s until 1967, dispenser canisters for C-S gas and "gravel" non-metallic land mines were manufactured at the Facility. During the Vietnam War, incendiary grenades were manufactured at the Facility. Other munitions manufactured at the Facility include: 20 millimeter tracer ammunition, 60 millimeter illuminating round (M-112), various types of detonators, bouchon fuses for hand grenades, primers, igniters, rocket igniters, pop-up explosive charges for anti-personnel mines, and flame thrower cartridges. These munitions were manufactured during World War II, the Korean War and the Vietnam War. MOX stands for metallized high explosives. C-S gas is also known as tear gas.

7. Chemicals, including explosives, used at the Facility to manufacture munitions for the military included acetone, alcohol, amyl acetate, black powder, butyl acetate, freon-15, lead azide, mercury fulminate, smokeless powder, and tetryl.

8. Mercury fulminate was a common primary explosive used predominantly during World War II. Lead azide was used predominantly during the Vietnam War era. Both mercury fulminate and lead azide were used only in the production of munitions for the U.S. government. The use of mercury fulminate significantly declined after World War II because the production of munitions that use mercury fulminate declined. Mercury fulminate was the only form of mercury used at the Facility during my employment. The use of lead azide significantly increased during the Korean and Vietnam Wars because the production of munitions, especially land mines, that use lead azide increased during that time.

9. The United States government supplied most of the explosives, and some other materials, used in manufacturing munitions, including black powder, freon-15, smokeless powder, and tetryl. The United States government regulated and accounted for all explosives that it shipped to the Facility.

10. The United States government required the munitions to be manufactured in accordance with government specifications.

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15. I observed that floor sweepings from the manufacturing areas were collected by the explosives crew and taken to burning pits where they were burned. Tailings and black powder would occasionally be burned in the disposal area.

16. General waste, including paper and cardboard, was collected daily and taken to the disposal area near Factory Pond.

Subscribed and sworn under the pains and penalties of perjury this 18th day of December, 1996.

Edmund H. Kent

Edmund H. Kent

COMMONWEALTH OF MASSACHUSETTS

Plymouth County December 18, 1996

Then personally appeared before me the above-named Edmund H. Kent, who swore that the above statements were true to the best of his knowledge and belief.

Phyllis J. Viera
Notary Public
My Commission Expires: 5/2/97

183901.b1

In The Matter Of:

AUG 1 1 1997

The Fireworks Site

Edmund H. Kent
July 17, 1997

Vol. I
pp. 1 - 224

Doris M. Jones & Associates, Inc.
Professional Shorthand Reporters
59 Temple Place
Suite 406
Boston, MA 02111
(617) 542-0039

Original File 0717kent.v1, 224 Pages
Min-U-Script® File ID: 2461882223

Word Index included with this Min-U-Script®

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MASSACHUSETTS

IN THE MATTER OF VERIFIED
PETITION TO TAKE DEPOSITIONS TO PERPETUATE TESTIMONY REGARDING THE FIREWORKS SITE — Civil Action No. 97 10279 MBD — VOLUME I — PAGES 1 to 224

VIDEOTAPE DEPOSITION of EDMUND H. KENT, a witness called by counsel for Kerr-McGee Chemical Corporation, taken pursuant to the Federal Rules of Civil Procedure before Michelle Sylvia, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at 215 Williston Road, Sagamore Beach, Massachusetts, on Thursday, July 17, 1997, commencing at 10:02 a.m.

APPEARANCES:

WRIGHT, MOEHRKE & MACKIE
By John D. Beling, Esq.
283 Dartmouth Street
Boston, Massachusetts 02116
Counsel for National Coating Corporation.

PALMER & DODGE, L.L.P.
By Jeffrey B. Araten, Esq.
One Beacon Street
Boston, Massachusetts 02108
Counsel for the Massachusetts Institute of Technology.

GOODWIN, PROCTER & HOAR, L.L.P.
By Christopher P. Davis, Esq. and
Jeanine L.G. Grachuk, Esq.
Exchange Place
Boston, Massachusetts 02109
Counsel for Kerr-McGee Chemical Corporation.

(Continued)
FOR THE UNITED STATES OF AMERICA:

U.S. DEPARTMENT OF JUSTICE
By Daniel R. Dertke, Esq.
P.O. Box 23986
Washington, D.C. 20026

DEPARTMENT OF THE ARMY
By Carrie M. Greco, Esq.
901 N. Stuart Street
Arlington, Virginia 22203

ALSO PRESENT:
David Sebestyen, Videographer

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Videotape
Deposition of: Direct Cross Redirect Recross
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PROCEEDINGS

THE VIDEOGRAPHER: We are going on the record. Today is Thursday, July 17, 1997. The time is 10:02 a.m.

We're located at 215 Williston Road in Sagamore Beach, Massachusetts taking the deposition of Mr. Edmund Kent in the matter of Verified Petition to Take Depositions to Perpetuate Testimony Regarding the Fireworks Site for the United States District Court, Eastern District of Massachusetts.

My name is Dave Sebestyen. I represent Jones Communications Group located in Boston at 59 Temple Place, telephone number 617-542-0039.

At this time if we could go around the room and introduce the attorneys for the video record. Please state your name, the firm you work for and who you represent starting to my left.

MR. DAVIS: My name is Christopher Davis with Goodwin, Procter & Hoar in Boston. I represent Kerr-McGee Chemical Corporation.

MR. DERTKE: Dan Dertke with the United States Department of Justice. I represent the United States.

MS. GRECO: Carrie Greco with the

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United States Army, Environmental Law Division. I represent the United States Army.

MS. GRACHUK: Jeanine Grachuk. I'm with Goodwin, Procter & Hoar, and I also represent Kerr-McGee Chemical Corporation.

MR. ARATEN: Jeff Araten. I'm with Palmer & Dodge in Boston, and I represent MIT, Massachusetts Institute of Technology.

THE VIDEOGRAPHER: The court reporter will now swear in the witness.

EDMUND H. KENT

a witness called for examination by counsel for Kerr-McGee Chemical Corporation, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION
BY MR. DAVIS:

Q: Good morning, Mr. Kent.

A: Good morning.

Q: My name is Chris Davis. I represent Kerr-McGee Chemical Corporation, and I'll be taking your deposition on behalf of the cooperating parties, which are Kerr-McGee Chemical,

Page 7

Massachusetts Institute of Technology and National Coating Corporation.

We appreciate your having us in your home today and allowing us to take your deposition. We'll try to minimize the inconvenience and move as quickly as possible.

I'm going to ask you a series of questions. If you don't hear or understand my question, please let me know and I'll repeat it or rephrase it.

If at any point you need to take a break, please let us know. We'll be as flexible as possible, and we'll take a recess as necessary.

Please state your full name.

A: Edmund Hamilton Kent.

Q: And your address?

A: 215 Williston Road, Sagamore Beach, Mass.

Q: And your birth date?

A: February 15th, 1915.

Q: That makes you 82 years old?

A: That's correct.

Q: Mr. Kent, I show you a document which is entitled "Subpoena in a Civil Case." Do you recognize that document?

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A: No, I don't, but I don't doubt that I – Did I sign it? No.

Q: Was a document like this one delivered to you prior to this deposition?

A: Yes.

Q: Okay. Do you understand that your deposition is being taken pursuant to that subpoena?

A: Yes.

Q: And you're appearing based on the subpoena, correct?

A: Right.

Q: And did you receive a fee for appearing at this deposition?

A: Yes.

MR. DAVIS: Could we mark that Exhibit 1.

(Exhibit Number 1 marked for identification)

Q: Could you please describe your education starting with high school.

A: Yeah. I went to Newton High School, graduated in '33.

Q: That's Newton, Massachusetts?

A: Yup. And then I went to University of

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Rhode Island in Kingston, Rhode Island, and I graduated from there in '38.
Do you want more?
Q: Yes.
A: Then I went to work for National Fireworks Corporation.
Q: We're talking your education, not your employment.
A: I'm sorry.
Q: Did you receive any other formal education?
A: Yeah. I've gone to MIT. I took a course in powder and explosives. I've also taken a course with University of Michigan on management. And I guess that's about it.
Q: Your degree from the University of Rhode Island, what field was your degree in?
A: BS in chemistry.
Q: Now we'll go into your employment. Could you please describe for us each of the jobs that you've held.
A: Sure. You mean going way back?
Q: Right after college, if possible.
A: All right. After college I went to work

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for – I got to think a minute. I went to work for National Fireworks Company.
Q: And approximately what year was that?
A: 1941.
MR. DAVIS: Maybe we could go off the record for a moment.
THE VIDEOGRAPHER: Sure. Off the record at 10:08.
(Off the record)
THE VIDEOGRAPHER: Back on the record at 10:09.
MR. DAVIS: I'd just like to note that Mr. Beling has arrived. Could you introduce yourself for the record.
MR. BELING: John Beling. I'm here on behalf of National Coating Corporation. Thank you.
Q: We were describing your employment. And I believe you just testified, Mr. Kent, that you went to work in about 1941 for National Fireworks Corporation?
A: Correct.
Q: What was your initial position with that company?

Page 11

A: Chemist.
Q: And where was your place of employment?
A: West Hanover, Massachusetts.
Q: And that's the facility that this deposition will discuss?
A: Correct.
Q: How long did you work at National Fireworks Corporation and its, we'll call them, successor corporations that operated at that same facility?
A: Approximately 35 years.
Q: And what year, if you recall, did you leave employment there?
A: Oh, boy. I think it was in – Gee, I don't remember.
Q: Well, could you – What's your best approximation?
A: Well, I left National Fireworks about 1971, and then I went to work for American Potash & Chemical.
Q: At another location?
A: No. Same location. The plant was sold three or four times, and I went with the sale.
Q: So you were still continuing to work at

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the West Hanover?
A: Yeah. I worked there for, as I say, about 35 years.
Q: Okay.
MRS. KENT: May I say something?
MR. DAVIS: Should we go off the record?
THE VIDEOGRAPHER: Off the record at 10:11.
(Off the record)
THE VIDEOGRAPHER: We're back on the record at 10:12.
Q: Mr. Kent, I'd like to show you another document and see if it helps refresh your recollection at all.
MR. DAVIS: We'll mark this one Exhibit 2.
(Exhibit Number 2 marked for identification)
Q: It's a document entitled "Affidavit of Edmund H. Kent" with a signature date of December 18, 1996. Do you recognize that document?
A: Yes.
Q: Could you tell us what it is.

A: Well, it's an affidavit that I made sometime ago about my work at National Fireworks and subsequent companies.
Q: Directing your attention to paragraphs 3 and 4 and asking you to read those. I wonder if that will refresh your recollection.
A: "I was formerly employed by National Fireworks, Inc. at the munitions and fireworks manufacturing facility in Hanover, Mass."
Q: I don't mean to interrupt you, but just read it to yourself. I don't need you to read it aloud. Just whether that refreshes your recollection.
A: Thank goodness.
(Pause)
A: Okay. I agree with all of that.
Q: So –
A: I'm talking about item 5. I finished that.
Q: Now I'll resume the questions.
A: Okay.
Q: If at any point you'd like to refer to that to refresh your recollection, let me know.
A: All right.

Q: So your initial position starting in 1941, I believe you testified, was as a chemist?
A: That's correct.
Q: And what were your responsibilities?
A: Well, I equipped the laboratory, bought – We were just getting underway. And my job was to buy chemicals, reagents, things of that nature to equip the lab.
Q: Okay. Now, you said you were just getting underway. What did you mean by that?
A: I mean, they didn't have a laboratory there. The plant when I went to work there was primarily a fireworks company. They manufactured fireworks.
It wasn't until later on that they got into making – The first two contracts were exploder bags for the British and – Let's see. Oh, tracer ammunition for the British, two pounder round.
Q: And when did that work begin, approximately?
A: Well, I'd say '42 or three.
Q: How soon after you arrived – Was that work in progress?
A: Making exploder bags was in process. The two pounder tracer was just getting started.

Q: And approximately how many employees were there at the facility when you arrived in 1941?
A: Well, since it was a fireworks factory, there were about 40 or 50, I would say.
Q: And did that number of employees change during your employment?
A: Oh, hell yes. The maximum employment was about 10 plants all over the eastern United States.
Q: Referring only to the West Hanover facility, however. About how many employees did that increase to?
A: Maybe 250.
Q: Only 250 at the peak at that –
A: Yeah. We had an auxiliary company over in Hanover called Pilgrim Ordinance. We manufactured magnesium powder over there. And we also had a detonator plant in Randolph known as American Fireworks.
Q: Okay. I believe Mr. Wolfert testified when we took his deposition a few weeks ago that there were as many as 5,000 employees at the peak in World War II at the National Fireworks facility. Do you disagree with that?

A: Well, maybe there were. I don't remember that number. We were running three shifts, but 5,000 seems high.
Q: When was the peak employment reached, if you know?
A: Well, I can't really tell you.
Q: Was it during World War II?
A: Oh, yeah.
Q: Did your job position change at any point during your employment at National Fireworks?
A: Yup.
Q: What did that change to?
A: Well, I was a chemist in the beginning, and then I went to the engineering department. I worked there preparing bids. Then I was sales manager. I went around to all our customers selling primers, detonators, things of that nature.
Q: Who were your customers?
A: Minneapolis Honeywell. Let's see. We made the 60 millimeter illuminating round. That was made for the government. We were the low bidder of about five or six bidders. And we manufactured that at West Hanover.
We also made over there mines, detonators,

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primers. Let's see what else. 60 millimeter illuminating rounds. That was a parachute flare. We made a lot of ordinances: incendiary grenades, bouchon fuses for hand grenades. We made gravel mines. That covers quite a bit of it.

Q: All of those products you just described, were they made for the United States military?

A: Yeah, primarily. Yes.

Q: So if another company was your customer were they a contractor to the military?

A: Well, maybe they were – Yeah, maybe they were making an item for which we made a primer, and they'd buy – Like, Honeywell bought primers from us for pop-up mines. Let's see. Well, there were many customers.

Q: Maybe we can go back into the World War II era –

A: All right.

Q: – at National Fireworks when you were a chemist. Approximately how long did you remain in the position as a chemist?

A: Well, maybe three years or four years. I then transferred to the engineering department.

Q: And approximately how long were you in the

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engineering department?

A: Quite a few years.

Q: Would your affidavit assist in refreshing your recollection as to your position?

A: It might.

(Pause)

Q: I direct you to paragraph 5 on the first page, in particular.

A: Yeah, that's all true.

Q: So how long were you a chemist, approximately?

A: Well, I was a chemist forever, but –

Q: How long were you called a chemist?

A: Very difficult to say. Once you're a chemist, you're a chemist.

Q: That your job title was chemist.

A: Yeah, but I later – I had a lot of titles: sales manager, head of engineering. I had many titles.

Q: Okay. I was just trying to get at the approximate time periods during which you had each of those jobs.

A: Well, I'm hazy on that, as you can tell. One of the big items we made were 20

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millimeters. That was our main – When I went there it was a fireworks company, and we gradually began loading 20 millimeter ammunition.

Q: I'm going to ask you about that in a few minutes.

A: All right. You don't want me to continue that, then?

Q: Not just now.

A: All right.

Q: Could you describe during World War II what you did as a chemist.

A: Yeah. I analyzed ingredients that went into munitions like potassium chloride, saltpeter, charcoal, you name it. All these ingredients had to meet military specifications, and we verified their compliance with those specs.

Now, the government also had people there, too. They had a chemical man. And we did work for the British Purchasing Commission. And they had a Canadian there. We had to supply facilities for these people to do the work in the lab.

Q: Now, at some point in World War II did all of the production of the National Fireworks facility in West Hanover shift to work for the United States

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government?

A: No.

Q: You were making munitions for the British during –

A: We made some for the British, minimal, and we made a lot of government contracts.

Q: For?

A: For munitions.

Q: For the United States government?

A: Yeah.

Q: At any point during World War II, if you know, was the United States the sole customer of the facility for munitions?

A: Not necessarily.

Q: What do you mean by that?

A: Well, I mean, if you had a contract to make something that required a mark 125 primer – I was making them, and I'd sell you any number if you wanted to buy them from me.

The competition was fierce. All those loading guys were down south. They had cheap help, and they gave us a run for the money.

Q: Okay. Maybe I wasn't clear. Were all of the products that the plant produced during World

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War II used either directly or indirectly for munitions for the United States government?
A: Yeah, I'd say that's true.
Q: Were you familiar with all of the products that National Fireworks made during World War II?
A: Yeah.
Q: Were you familiar with the layout of the facilities?
A: Yes.
Q: Why don't we move to the physical plant. I'm going to show you another document, which is a map with some markings on it.
MR. DAVIS: We will mark this one as Exhibit 3.
(Exhibit Number 3 marked for identification)
Q: How is the best way to do this? Should we slide the table over?
A: (No verbal response)
Q: Do you recognize this document?
A: Oh, yeah.
Q: What is it?
A: It's a plant map of the facility in West Hanover, Mass.

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Q: The National Fireworks facility?
A: Yeah.
Q: Is this map a fair and accurate representation of the physical layout of that facility?
A: Yes.
Q: During times that you were employed there?
A: Oh, yeah.
Q: As of what time period were all of these features and buildings that are shown on this map in existence? When you got there?
A: No. Building 307 was built by a foundation company.
Q: About when was building 307 built?
A: '41 or two.
Q: During World War II?
A: Yeah.
Q: Okay. Any others that were built while you were there or groups of buildings?
A: Building 305 I think was built during that time. That was a pellet press – Right here (indicating). That was a pellet press building.
Q: You're referring to approximately the center of the facility, to the buildings that are

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numbered?
A: Yeah.
Q: Okay.
A: This is a long, narrow – It had a lot of narrow stalls in it.
Q: Any other buildings that were built while you were employed, that you recall?
A: Well, the laboratory was built while I was there. I supervised that.
Q: You supervised the construction of the laboratory?
A: Yeah.
Q: Okay.
A: That was built by the foundation company, though, I believe. The foundation company came in here and built a lot of buildings for the plant.
Q: Who were the foundation company?
A: They're a big contractor that would build buildings on a plant site.
Q: Now, can we agree, just for purposes of orientation, on Exhibit 3 that where your left hand is, the left end of the map, is north?
A: Let me –
Q: That way (indicating). Does that sound

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right to you?
A: Yeah.
Q: That would make the right end south?
A: Yup.
Q: The left or the bottom toward you would then be west?
A: Yup.
Q: And over the top toward me would be east, correct?
A: Yup.
Q: Okay. Where were the production buildings located where munitions were manufactured?
A: Well, the whole damn plant was a munitions factory eventually. The fireworks got phased out, you know. They made skyrockets, snakes, aerial flash bombs.
Q: When were the fireworks phased out?
A: I'd say about 1942.
Q: And as of that time everything was munitions?
A: Yeah. They were making caps and sparklers up until '42 or '43, but after that they gave up. They made a lot of caps.
And they designed a cap pistol to look

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like an Army automatic, and the kids wanted a six shooter, so it went over like a lead balloon. We couldn't give them away.

Q: Could you indicate where you worked during World War II on Exhibit 3?

A: Well, I was all over the plant.

Q: Did you have a main office or base of operation?

A: Yeah. I was in building 295. I don't see it on here.

Q: Well, could you tell us generally where within the facility that was located?

A: Yeah. It was in this area right here (indicating).

Q: You're referring to an area south of the Drinkwater River?

A: Yeah.

Q: Was there a laboratory at that location?

A: Yeah. Building 295 was the laboratory. Whether it's on here, I can't really tell. It should be on here.

Q: I realize this exhibit is sort of hard to read. It's been photocopied. Were there any other buildings in which you worked during World War II?

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A: Well, I supervised operations all over the plant, so I –

Q: Could you describe what those operations were and where they were, generally?

A: Yeah, maybe. Well, let's see. Building 307, that's this building here (indicating). We made mark 125 primers. We made tetryl pellets for 20 millimeter.

And we assembled the 20 millimeter, I guess, in the far end of this building (indicating).

Q: You're pointing to building 307, which is this long building that runs from north to south in approximately the center of the map?

A: Right.

Q: And you supervised that operation at some point?

A: Well, no. I wasn't a foreman, but I had supervisory responsibilities down there.

Q: Well, what were you responsible for in building 307?

A: Pellet densities that went into 20 millimeter, graphite content in the pellets that went in the 20 millimeter, consolidating pressures that we used to reconsolidate the tetryl pellets

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into the rounds. Then we made tracer ammunition over in here (indicating).

Q: Can you describe from the map where "over here" is, what landmarks it was near, roads or whatever.

A: Yeah. Let's see.

Q: Were any buildings that you can –

A: Yeah. I'd say in this area here (indicating) we made tracer ammunition.

Q: You're pointing along the Drinkwater River?

A: River.

Q: And about the left center of the –

A: Yeah. We called this Tracer Island. It was swampy, but our tracer guy mixed all the powder over there. And he was the only guy that did it. And our tracer ammunition was better than anybody else's.

Q: Now, you called it Tracer Island. Sometimes there has been an area of this facility where it's referred to as Fox Island.

A: Same thing.

Q: Where is that?

A: Same thing.

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Q: And that's the northeastern part of the facility near the bend in the river?

A: Right. Right.

Q: By the way, on this Exhibit 3 there are a number of handwritten markings.

A: Yeah.

Q: Could you tell us what those are?

A: Well, that's my writing. And that says, "Warehouse of Chemicals." In other words, we had magazines out in the outskirts, and we stored the tetryl and all the high explosives there.

Now, this area here (indicating) –

Q: Could I stop you for a minute? When did you make the markings with the words and the arrows on the exhibit?

A: God, I don't know.

Q: Was it in your prior deposition?

A: Yeah.

Q: In about 1993?

A: Maybe.

Q: Why don't we go through the other things that you've marked here starting clockwise.

A: Well, all right. Let's go here (indicating).

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Q: Okay. The upper eastern center of the exhibit.
A: That was our magnesium powder manufacturing area. And we manufactured 5,000 pounds of magnesium powder a day.
Q: And you've written here "Magnesium Powder Area" on the map with an arrow toward the top eastern end?
A: Yup.
Q: What other things have you designated here? Would there be a more convenient way for us to spread that out?
A: I can see it. This is a magazine area (indicating).
Q: Now we're in the oblong egg-shaped area in the very center of the exhibit that you've written "Magazine"?
A: Yup.
Q: What else could you point out for us that you've shown on Exhibit 3?
A: (No verbal response)
Q: Let me go back. What happened in the magazine area?
A: Just storage of explosives.

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Q: Was this finished product or raw material?
A: Raw materials primarily.
Q: Were you familiar with all of the chemical raw materials that were used?
A: Yup.
Q: We'll get into that in a few minutes. So continuing clockwise around the map, the next thing you wrote?
A: Well, don't look at this casually. This was a big operation up in here (indicating). We made 5,000 pounds of magnesium a day, and it was ideal for making tracer ammunition.
In other words, the particles were dendritic and they took fire easily.
Q: And you were involved with the magnesium operation?
A: Yeah. I tested it all in my laboratory over here in building 295. I can't seem to find that.
Q: I have another map here I could mark as – Oh, okay. There is something designated as "Control Lab" that looks like your writing in the lower left.
A: That's it.

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Q: Can you see that?
A: Yup.
Q: Lower left right over the exhibit sticker there.
A: I don't see it.
Q: Do you see the word "Control Lab"?
Mr. Araten is pointing to it.
A: Oh, all right.
Q: Lower left.
A: I see it. Now, we had a bunch of chemists in there, the government chemists and our own, that did all the analysis of these materials that went into the munitions.
Q: Now, we're talking World War II era right now?
A: Yeah.
Q: About how many government chemists were there in that building?
A: Two to four. And then – That's American. And then there were two British chemists in there.
Q: At some point did the British chemists or the Canadians leave?
A: Well, yeah. They left when their interest

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subsided.
Q: Were they there through all of World War II, the British and the Canadians?
A: Not necessarily. The Army chemist was there for maybe three or four months – I mean three or four years.
Q: Army, is that U.S. Army?
A: Yeah.
Q: Were they there every day?
A: Oh, yeah.
Q: What was the job –
A: Our obligation was to furnish them laboratory facilities so they could analyze the chemicals used in the munitions.
Q: So the Army chemist or chemists did their own analysis?
A: Correct.
Q: Did they –
A: They checked on us.
Q: Did they ever give you any instructions or specifications?
A: Oh, sure. A lot of instructions.
Q: Could you give an example?
A: Like, "This is no good." No. I'm being

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facetious.
Q: Something specific that you can recall that they would have told you or directed you?
A: Well, okay. We had a lot of TNT that we stored over in that island that got wet, and we had to dry it out.
And we had to have the government chemist check the moisture content of these samples almost daily until we used it up.
So every now and then they'd say, "No. That's too wet. You got to dry it for another day or two" or "week or two."
Q: During World War II were there United States government chemists present?
A: No, not all the time. Whenever the need came up. Like, for instance, when we were making gravel mines we had as many as 30 or 40 government chemists there.
Q: Was that after World War II that you made gravel mines?
A: Yeah, I would say so. Yes.
Q: Approximately when? Was that the Korea or Vietnam era?
A: I would say Korea, but don't hold me to

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it.
Q: And as to the gravel mines, what was the role of the government chemists?
A: Well, the role of the government chemists was to check the manufacturing process of the mine. And it's a long procedure.
It had a strong back in it. It looked like a tea bag. It had gravel in it. It had RD 1333 lead azide. It had ground glass. And as I say, it looked like a tea bag.
And they were deployed from missiles. We ejected a whole load of those over different areas. And they were made insensitive by freon – liquid freon.
And as soon as they hit the ground, they started to dry out. And as soon as they dried out, they were very sensitive to friction; and if you stepped on one, no foot.
Q: Did the government – The government chemists, were they also inspectors?
A: Yes. There was a whole bunch of inspectors, though, who worked for the government who were not necessarily chemists.
Q: Could you describe them? We're going to

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talk World War II for now. Tell us about the government inspectors.
A: They were civil service employees.
Q: What government branch did they work for?
A: The Army.
Q: Were there ever any inspectors from the Navy or the Air Force?
A: Yes. The 20 millimeter project had a lot of Navy inspectors because that was a Navy item.
Q: And where were they located, those Navy inspectors?
A: Well, let's see. They worked out of building 295 and production buildings where the materials were manufactured. In other words, if you were inspecting gravel mines you'd be stationed in that building.
Q: Where was that building that gravel mines were made in?
A: Building 85, I think.
Q: Can we find that one, the 80s buildings?
A: I can't see it here. It was a production building.
What do I need to tell you?
Q: During World War II were there government

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inspectors in building 307 where the 20 millimeter work was done?
A: Yes.
Q: About how many?
A: I'd say five or eight.
Q: Were they all from the Navy?
A: Yeah.
Q: What did they –
A: Not necessarily. Sometimes the inspection duties crossed over. In other words, if you worked for the Army ordinance, they would station you in there and you might inspect Navy material.
Q: Maybe we could go through each of the military entities that these various inspectors worked for.
A: I hope not.
Q: You said Army ordinance.
A: Yeah.
Q: That's one group of inspectors?
A: Yup.
Q: Navy?
A: Yup.
Q: Any particular branch of the Navy?
A: Well, let's see. Where did they report?

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They reported down in the munitions building in Washington, and they inspected 20 millimeter.
Q: Okay. Were the Navy munitions inspectors civilian, civil service employees or military?
A: Yes, civil service.
Q: Army inspectors, were there any of them?
A: Yeah, plenty of them.
Q: What group were they with?
A: They were with the U.S. Army.
Q: Any particular branch?
A: Well, inspection corps or whatever. I don't know the exact title.
Q: What did they inspect?
A: Well, they inspected 60 millimeter illuminating rounds. They inspected gravel mines. They inspected primers, detonators. We made four or 5,000 detonators a day, and they'd draw a sample. We had a regular test that they blew a hole in a lead disk. And the hole had to be so big; and if it wasn't, they were rejected.
Q: What was rejected?
A: The detonators, the lot. There was lot 21, 25,000 dets. It might be rejected.
Q: So what would happen if the detonators

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were rejected, the whole lot of them? What would happen to the detonators?
A: Probably destroyed.
Q: Would the inspectors direct that they be destroyed?
A: Oh, yeah.
Q: And then what would happen to them?
A: We'd take them down to our disposal area and burn them. We'd put sawdust on the ground and put the detonators on top and got out of the way and let her burn.
Q: Okay. Now, let's find the disposal area. Where was that on Exhibit 3?
A: Well, where is the pond, Factory Pond? Yeah, I see it.
Q: There is some writing down here at the right end of the map.
A: Yeah, "Burning Area." There we are. We'd spread the dets out on sawdust or shavings and light them off.
Q: This is the rejected detonators?
A: Yes.
Q: Now, you've pointed to an area where – an approximate circle at the right or southern end of

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the facility. Can you read what you've written there?
A: Yeah. "Burning Area."
Q: And below that?
A: "Boundary of Disposal Area."
Q: And that you designated in your prior deposition?
A: I think so, yeah.
Q: As you sit here today, is that an accurate depiction of where the disposal area was located?
A: Yeah.
Q: Now, there is also an arrow that you have running into Factory Pond from the bottom of Exhibit 3. Could you read what you've written?
A: "Detonator, Lead Azide." Sometimes we would put a bag of lead azide in the pond because it was wet and detonate it in the pond if it was rejected.
Q: Why did you do that?
A: Get rid of it.
Q: But why in the pond as opposed to on land?
A: Because it cut down on the noise. It made it insensitive. The water desensitized the lead azide to a certain extent. And that's about it.

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Q: What products had the lead azide in them that would have been disposed of by detonation in Factory Pond?
A: A lot of primers, detonators. Detonators usually had three increments: an initiator, a middle portion and a high explosive. So you put three increments in, pressed them, put an aluminum cover on them, crimped them, sized them, painted them, put them in cardboard containers and shipped them out to the loader.
Q: Okay. Now, the detonators that were disposed of in Factory Pond, were those ones that were rejected by the government inspectors?
A: Yeah.
Q: Were there any other categories of detonators that were disposed of in Factory Pond?
A: Well, sometimes we had some that were defective on our own reasons, but normally they were ordinance rejected.
Q: About how often did disposal of rejected detonators occur in Factory Pond during World War II?
A: Every day up to – I can't give you the time frame, but they were rejected daily. They were

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collected by a refuse truck from the production buildings, taken down to this area here (indicating), spread out on the shavings and burned.
Q: How did you decide for rejected detonators whether they were burned on the ground in the disposal area as opposed to put in Factory Pond for detonation?
A: Well, usually we detonated them in these ponds because it cut down on the noise.
Q: Did the military inspectors tell employees of National Fireworks where to take their rejected items?
A: No.
Q: Were government inspectors, to your knowledge, present to watch the detonation or burning of rejected munitions?
A: If they wanted to be they could witness it.
Q: Were you ever down in the disposal or detonation area to witness -
A: Many times.
Q: Why were you down there?
A: I wanted to see what was going on.
Q: Were there military inspectors present

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when you were down watching the disposal?
A: Sometimes, yes.
Q: Were you aware if they gave any instructions down there about disposal?
A: Well, no, I'm not, but I'm sure they did. You know, they would say, "Lots 18, 20 and 51 are going to be disposed of" and, "What are you going to do about it? Are you going to do it here or what?"
Q: Can you estimate the percentage of detonators that were rejected by the military inspectors during World War II?
A: Very few.
Q: But yet it occurred daily?
A: Yup. Well, the disposal of surplus explosives were disposed of daily, but the detonators and primers were seldom. You know, they were - Let's see, how can I word it? I'm having a mental block here at the moment, but I'll resume in a second.
Q: Should I ask you another question?
A: Sure. Go ahead.
Q: You said surplus munitions were disposed of. How did munitions get to be surplus?
A: Well, we might have overbought on certain

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items or it was questionable as to whether we could use it or not. We didn't take a chance. We blew them up. That's about it.
Q: What items - Would you call them surplus if they were defective?
A: Yeah. Well, if they couldn't be reworked we would destroy them.
Q: Now, you talked about detonators as having three components?
A: Yeah.
Q: Where was the lead azide in the detonators?
A: At the initiating end.
Q: Okay. What else was in a detonator? Chemicals?
A: Well, lead azide, RDX.
Q: What's RDX?
A: That's an explosive developed by the British.
Q: Okay. What other chemicals?
A: Let's see. Tetryl was usually one of the final explosives crimped into the detonators.
Q: Can you spell "tetryl" for the reporter.
A: T-E-T-R-Y-L.

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Q: Okay.
A: And I can't spell.
Q: Any other chemicals that were used in detonators?
A: Yes. Lead azide, fulminate of mercury.
Q: What's fulminate of mercury?
A: Well, it's a primary explosive, mercury and nitrogen. And it's very sensitive and hard to handle.
Q: Any other chemicals that were in detonators?
A: Yeah.
Q: I think antimony sulfide.
Q: Antimony?
A: Yeah, antimony sulfide. A lot of different chemicals depending on - The government all had specifications on these items, so you can look them up if you'd like.
Q: Did the government supply National Fireworks with written specifications?
A: Yes.
Q: For each munitions product?
A: (No verbal response)
Q: Did you use those specifications yourself

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in any way?
A: Oh, sure.
Q: How?
A: I'd look at them, read them.
Q: For what purpose?
A: Well, to refresh my memory or to decide what we were going to do next or how we were going to handle it.
Q: Did the government specifications for a munitions product such as primers or detonators say what chemicals would be used to make them?
A: Absolutely.
Q: And how much?
A: Yup.
Q: And would it be put together?
A: Well, no. The mixing was left up to the contractor.
Q: But in terms of the various parts and how you assembled it, was that part of the specifications?
A: Yup.
Q: For a detonator, for example?
A: Yeah. Told how many increments, what the increment was, what the pressure was. Yes.

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Q: Okay. We've been talking World War II. Did the government continue to supply specifications for each of these munitions products after World War II?
A: Sure.
Q: So that would include the Korean War era?
A: (No verbal response)
Q: You have to answer out loud.
A: Yes.
Q: Vietnam War era?
A: Yup.
Q: Right up until the early '70s when you departed?
A: Yes.
Q: We'll take a break in about five minutes, or would you like to take one sooner?
A: No. That's fine.
Q: If you want to take one at any point, just raise your hand or say, "Let's stop." I just wanted to finish what you've written on this map, Exhibit 3.
A: Okay. Go ahead.
Q: Continuing clockwise here, we're past the lead azide detonator. At the bottom center of

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Exhibit 3 you've written something.
A: "Degreaser."
Q: And following the arrow up, where does it point from "Degreaser"?
A: 307. This end of 307. The projectiles would come in covered with grease, and we had to degrease them before we loaded them.
Q: These are 20 millimeter projectiles?
A: Yes.
Q: Any other kind?
A: Yes.
Q: What kind?
A: Well, 40 millimeter tracer. I can't seem to remember any others.
Q: These were what civilians like us might call the shells?
A: Yeah. We made a lot of 20 millimeter. That was our reason for existing.
Q: And were they all made in building 307?
A: They were consolidated. The pellets were made over here in this building (indicating). They were brought over here as pellets. And they were put in the projectile, and then they were reconsolidated, and then they were faced.

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Q: You said this building (indicating). Could that be building 305?
A: Yeah.
Q: I have another exhibit here.
MR. DAVIS: In fact, maybe we could mark that as Exhibit 4. This has clearer building numbers.
(Exhibit Number 4 marked for identification)
Q: I show you Exhibit 4. Do you recognize that map, what it shows?
A: Yeah. Same map.
Q: Of what?
A: The plant at West Hanover, Mass.
Q: The National Fireworks?
A: Yeah.
Q: The same facility that's shown in Exhibit 3?
A: Absolutely.
Q: Can you find building 307 here on Exhibit 4?
A: Yeah. Right here (indicating). This is a better map. Right there.
Q: Can you find the other building where you

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said the 20 millimeter – some of the work was –
A: Yeah. Right there, 305.
Q: You have another word or series of letters written here by building 307 on Exhibit 3. What does that say?
A: I can't really tell.
Q: I'm sorry. It looks like TCE.
A: I don't know what that means.
Q: Okay. What was used to degrease the shells in building 307?
A: Trichlorethylene.
Q: Is it possible that TCE is an abbreviation for that?
A: It might be. I don't see it that way.
Q: Is this your writing, "TCE," here?
A: I think it is, but I'm damned if I know what it is supposed to be.
Q: But if you had to write down what it was that was used to degrease the shells in 307, it would be trichlorethylene?
A: Trichlorethylene is correct.
Q: Is that a solvent?
A: Yes, it is.
Q: Were any other solvents used to degrease

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shells in building 307?
A: No.
Q: Was trichlorethylene used throughout World War II to degrease shells in 307?
A: I'd say so, yeah.
Q: How about after World War II?
A: Well, I don't know what – how many we loaded after World War II.
Q: Now, there was another word right to the right of "Degreaser."
A: "Vapor."
Q: What other words?
A: "Vapor Degreaser Storage."
Q: What does that refer to? You have an arrow pointing to the center of the map.
A: I built a still to reclaim trichlorethylene.
Q: When did you build that?
A: Oh, '42 or three.
Q: What was the purpose of the still?
A: I wanted to reclaim the trichlorethylene so I could use it again to degrease shells.
Q: About how much trichlorethylene was used in, say, a day for degreasing during World War II in

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building 307?
A: 100 gallons, maybe.
Q: When it became dirty did you send it to the still?
A: Yeah.
Q: Was there any waste product from the still?
A: A little sludge.
Q: In the course of a week, can you estimate how much sludge was generated from the still?
A: No.
Q: Would it have been as much as a drum?
A: No.
Q: No?
A: Very little. Half a bucket.
Q: Half a bucket in how long a period?
A: I don't know. You're splitting hairs.
Q: Well, I'm trying to get your best estimate.
A: Very little.
Q: What was done with the sludge that came from the still?
A: Taken to the disposal area and burned.
Q: Does trichlorethylene burn?

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A: I don't think so. We burned it anyway.
Q: Would you like to take a break now?
A: Yeah. Why not?
THE VIDEOGRAPHER: Off the record at 11:01.
(Recess taken)
THE VIDEOGRAPHER: We're back on the record at 11:17.
Q: Mr. Kent, just a couple more questions that refer to the map, Exhibit 3.
All of those handwritten markings that we've gone over that you made in your deposition in 1993, to the best of your recollection today, do those accurately show what you've depicted in terms of the locations?
A: Well, yeah. You could handle a lot more information, but basically what's there is correct.
Q: What you've written is correct?
A: Yeah.
Q: I just want to ask you about a couple more things and where they were produced. If you want to refer to building numbers either on Exhibit 3 or Exhibit 4 – We'll try 4 which has clearer writing.
Where were the gravel mines produced?

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A: Right here (indicating).
Q: You're also going to have to say what "right here" means.
A: Yeah. I'll get you pointed in a minute. That building there, 80 – I think it's 85. I can't read it. It looks like 85. That was the main production building for gravel mines.
Q: Those were the ones that had the freon in them?
A: Freon, RD 1333, lead azide, RDX, glass, ground glass. They also had an agent in them – in some of them to desensitize them after a given time because they were, you know – If you stepped on them, you lost your foot.
Q: Okay. Let's go through a couple of other products that were produced at the facility.
A: All right.
Q: Primers. Where were primers made?
A: Let's see. Where are we here? They were made – I got to get oriented here. All right. They were made over in here (indicating).
Q: Do you have building numbers? Can you read those? You're at the far left or northern end of – The top, I guess.

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A: Well, I'm not dead sure, but these were the general area.
Q: You're pointing to building 18 –
A: 186 and 340 something.
Q: 346. The two that are next door there on D Street at Third Street, it looks like?
A: Yeah.
Q: Where were detonators produced?
A: They were made all over the plant. In 307. I don't know where it is. We had two or three lines in there. And we had a number of lines in these buildings here (indicating), 176 and – Is that 113?
Q: Next to 176?
A: Yeah.
Q: There on Third Street at D Street?
A: 346. But in this general area we made detonators. And we also – That was it.
Q: How about flares? Where were flares made?
A: 307 primarily. The 60 millimeter illuminating round had a flare in it that burned for about five minutes or less.
It had a lanyard on it. You had to carefully assemble the thing. It was made of

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magnesium powder and potassium nitrate and polyester resin. And the resin would cure up and bind the thing together.
And it was a damn good flare. It burned fast and it put out a lot of candle power. I don't dare say how much because I'm not sure.
Q: Okay.
A: You couldn't look at it with your naked eye.
Q: Was anything made on Fox Island?
A: No. Fox Island was a primary explosives processing building.
Q: And what primary explosives were processed?
A: Lead azide primarily.
Q: Okay.
A: For primers.
Q: Was there anywhere that mercury fulminate was used?
A: Very seldom. We used to use it on some primer mixes, but it was gradually discontinued.
Q: During World War II was mercury fulminate used in the 20 millimeter shell-filling operation?
A: No.

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Q: Was it used anywhere else during World War II, mercury fulminate?
A: I don't know, but I don't think so.
Q: What would mercury fulminate have been used for if it was used?
A: It was an initiating explosive. It was used to initiate detonation in detonators, primers, et cetera.
Q: Okay. Could I direct your attention to paragraph 8 of your December 1996 affidavit and just ask you to read the beginning of paragraph 8 and see if that refreshes your recollection about –
A: "Mercury fulminate" – Do you want me to read it to myself?
Q: Why don't you read it to yourself, then I'll ask you a question about mercury fulminate.
(Pause)
Q: Let me just ask you a couple questions. Does that refresh your recollection at all about the use of mercury fulminate?
A: Yeah. We used very little of it.
Q: What was it used for when you used it?
A: Initiating explosive.
Q: For 20 millimeter?

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A: No. It was used in detonators and primers.
Q: Okay. Would it be accurate to say that to the extent it was used, it was used more earlier on, say, in the World War II era?
A: Yeah, I would say so.
Q: Okay. Was all the mercury fulminate that was used used to make munitions products?
A: Yes.
Q: Was all the lead azide that was used used to make munitions products?
A: Yes.
Q: Was the freon that was used used to make munitions products?
A: It was used to desensitize lead azide.
Q: To make mines?
A: Yeah.
Q: Was freon used for anything else at the facility other than that?
A: No.
Q: We're going to talk a little bit more about some of the products. I think you've indicated 20 millimeter ammunition was the main product made by this facility in World War II; is

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that correct?
A: That was our bread and butter.
Q: How much, if you can estimate, 20 millimeter ammunition was produced at West Hanover, say, in a given day or week or month, however you want to do it?
A: Gee, I can't give you an accurate number, but it was – I mean, we made a lot of 20 millimeter. We had our own azide plant that made primers for 20 millimeter. And we did the proof testing at our Halifax facility.
Q: During World War II was 20 millimeter ammunition the largest single product of the National Fireworks West Hanover facility?
A: I'd say it was, yeah.
Q: And who was the customer for that ammunition?
A: The Navy.
Q: What did they use it for?
A: Well, killing people.
Q: Was there any particular use for those shells?
A: Yeah. (Inaudible) gun.
Q: Are those aircraft guns?

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A: Yeah. That and personnel.
Q: On ships?
A: Yup. They used them a lot on ships, although they weren't too powerful. And they gradually gave way to using them on the two pounders or 37 millimeter, twin mounts.
Q: Okay. How about 20 millimeter tracer shells?
A: Okay.
Q: Were they made during World War II?
A: Many. We were the primary developer of the 20 millimeter tracer.
Q: And who were they made for?
A: The Navy.
Q: Okay. Incendiary grenades, were they made at West Hanover?
A: Yup. A minor product, but we made quite a few of them.
Q: Who were they made for?
A: Chemical Corps. You pulled a pin, threw it. And it had a bouchon fuse. And it had about a three-minute delay, and then it would burn.
Q: Is the Chemical Corps part of the Army? Who were they?

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A: Yeah, I guess you'd – Yeah, I think so.
Q: Okay. Tell me what a bouchon fuse is.
A: A bouchon fuse is a hand grenade fuse. You know, you pull the pin and throw the grenade. You've seen that in the movies.
Well, this bouchon fuse was a die casting housing with a column in it, and we put an engine – That was used to initiate a hand grenade.
It had a snap primer in it. And when you pulled that pin and threw it, that primer came over and started the delay column burning for about four minutes. And you had four minutes to get out of the way or throw it. And it detonated the grenade.
Q: Okay. What chemical materials were used to make a bouchon fuse?
A: Zirconium nickel powder and potassium dichromate, I believe.
Q: Were they made at West Hanover?
A: Yes.
Q: The bouchon fuses?
A: No. We bought the castings but loaded them there.
Q: Okay. Getting back to the 20 millimeter ammunition, can you describe each of the components

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that the National Fireworks facility put into them?
A: Yes. The 20 millimeter had a number of different categories. It had HEI, which was high explosive incendiary; it had AP, armor piercing; it had high explosive tracer.
It had a number of categories. We made them all. And they would intermix them in a charge - in a gun so that they could see where the shell was going and correct for it.
Q: Okay. Did you testify that lead azide was used as an explosive in the 20 millimeter shell?
A: Yes. It was used in the primer.
Q: In the primer?
A: Yeah.
Q: Is it true that mercury fulminate was used in the initiator?
A: 20 millimeter?
Q: Yes.
A: I don't know. It was used in the projectile - the primer that you sealed at the end of the shell. That was -
Q: It was used in the shell, whether or not it was in the initiator, mercury fulminate?
A: Right.

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Q: Just a quick question. During World War II how many shifts did this plant run?
A: Three.
Q: How many days a week did it operate, if you know?
A: I would say five days, four days. Maybe five days.
Q: Were you knowledgeable about the specific contracts that the National Fireworks West Hanover facility had with the military?
A: Some of them. We had a contract administrator who took care of those details.
Q: When would you become familiar with a particular contract, you, yourself?
A: Well, on the 60 millimeter I was very familiar with it.
Q: Why was that?
A: Well, I was involved in it. I made the rounds and did the proofing, went down to Aberdeen and witnessed the acceptance tests. And, you know, that's about it.
Q: Now, for the munitions products that we've talked about, do you know who owned the explosive materials that were used?

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A: By and large I would say we did. We bought them ourselves. Like the mining program. We bought the lead azide from Dupont.
Q: Do you know if at any point ownership of the explosive materials transferred to the government?
A: No, I don't really know that. No, I wouldn't say so.
Q: Do you know if any raw materials that were used at the West Hanover plant were supplied by the government?
A: No, I don't know.
Q: Were fuses made at National Fireworks?
A: Yes.
Q: Could you describe what a fuse is?
A: Well, a fuse is usually an item that screws into the nose of the projectile. And it has a time train in it. And you can adjust the time of detonation by turning the fuse. And it generally had a primer, detonator and booster.
Q: What chemicals would typically be used in fuses that were made at National Fireworks?
A: Primer mixers were used to initiate the explosion. And then booster pellets, like tetryl or

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RDX or some other primer explosive, was used to build the charge up.
In other words, you had a small charge to start with and a larger one next on the line. And then you got up to the tetryl charge in a 20 millimeter, for instance. When that detonated the whole round went up.
Q: Okay. Was mercury fulminate ever used in making fuses?
A: Yes.
Q: How about lead azide?
A: Yes.
Q: What is an M1 A1 squib?
A: That's a polyethylene initiating device, two wires out of it and a head. And the head had two cover wires.
And we soldered a bridge wire across the end. And then we put a dab of high explosive primer mix on that bridge, dried it and then buttered in an initiating composition that was dried and then dipped in aluminum paint. And that's basically it. We made millions of them.
Q: What were they used for?
A: They were used for Navy rocket ignitors,

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all sorts of munitions that required a flame to initiate the charge.
Q: Now, were the M1 A1 squibs made during World War II?
A: Yes.
Q: Were they made after World War II?
A: Yeah. I think we always made a few of them.
Q: Okay. Were they made for the Korean War era; do you know?
A: I'm sure we did, yeah.
Q: Okay.
A: We had our own plastics supplier and we had girls that soldered that bridge wire on. We had a pull test on the bridge wire. It was quite a complicated little process.
Q: Okay. Would the M1 A1 squibs have used any lead azide?
A: No.
Q: Or mercury fulminate?
A: I doubt it.
Q: Okay. The primers that you made, would they have used any lead azide?
A: Yes.

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Q: And mercury fulminate?
A: No.
Q: Powder?
A: No. Mostly lead azide.
Q: Okay.
A: We made an item called the NOL – the mark 125 primer which used NOL 130, which was a composition developed by the Naval Ordinance Lab.
Q: Does NOL by any chance stand for Naval Ordinance Lab?
A: Yes.
Q: Let me go through some chemicals that – and just ask you if they were used, to your knowledge, at the West Hanover facility and what they were used for. Methylene chloride?
A: Yeah. I think we used it, but I don't know what for. Maybe it was a cleaning solution.
Q: Would that have been used in your laboratory?
A: Yeah.
Q: Trichlorethylene?
A: Degreaser.
Q: That's what we've referred to out of building 307?

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A: Right.
Q: Tetryl chloral ethylene, do you know if that was ever used?
A: No, I don't.
Q: Xylene?
A: Yeah. That's an organic solvent.
Q: What was that used for?
A: Cleaning.
Q: Where?
A: Wiping off rounds, decontaminating benches.
Q: Would that have been used in the production facilities, Xylene?
A: Yup.
Q: During World War II?
A: Yup.
Q: After World War II?
A: It was a general laboratory chemical.
Q: But you said it was also used in the production areas for cleaning?
A: Yeah.
Q: Benzene, was that ever used at West Hanover?
A: Yeah, but that was a very toxic organic

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solvent. We tried to stay away from that. That gave you pernicious anemia if you breathed that too much, so we didn't do that.
Q: When it was used what was benzene used for?
A: Benzene or benzol was used for cleaning.
Q: In the laboratory?
A: Yeah.
Q: How about in the production areas?
A: No, I don't think we used it much in the production.
Q: Okay. Naptholene, was that ever –
A: Cleaning.
Q: In the laboratory?
A: Yeah.
Q: How about production areas?
A: A little bit.
Q: Benzol alcohol?
A: That sounds like something used in cosmetics. I don't think we used that.
Q: Were there any other cleaning solvents that you know of that were used in the production areas at West Hanover?
A: Acetone.

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Q: What was that used for?
A: Cleaning.
Q: Cleaning anything in particular?
A: Yeah. Well, general cleaning. If some substance wouldn't dissolve in acetone, it wouldn't do much for anything else.
Q: Do you know if trichlorethylene was ever used as a cleaning solvent?
A: Yup.
Q: Other than to degrease shells, was it used for anything else?
A: Maybe. It was very toxic, though. And you could absorb it through your skin and your hands and your nose.
Q: Freon, you've mentioned that being used in mines?
A: To desensitize lead azide.
Q: Now, where was freon used in the facility? What location?
A: Building 85.
Q: Building 85. Was it stored at building 85?
A: Yeah.
Q: How?

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A: We used a lot of it. We got it in in drums. We had a production line.
And the girl would have a mound of lead azide on the bench in front of her, and it would be wet down with freon.
And she'd cut out a bit and weigh it and then put it over here for the next person to put in the mine. It was a hazardous operation.
Q: Do you know how many drums of freon, say, would be used in a week or a month?
A: No, but we used a lot of it.
Q: Can you quantify "a lot"?
A: Well, I would say we used a couple of drums a week.
Q: Okay. Were there any chemicals that were ever stored in tanks either below ground or above ground at the facility?
A: Yeah.
Q: What chemicals were they?
A: Freon was one of them.
Q: And where was the freon tank?
A: Above – Right next to building 85.
Q: During what time period was the freon used at building 85? Was this after World War II?

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A: Yeah.
Q: Korean War era?
A: I don't know. I don't want to put a date on it. It was used during the gravel mine production.
Q: Did that include the Vietnam era, the '60s?
A: Yeah, I would say it did.
Q: I may have covered this. If so, I apologize. Where was lead azide used in the production part of the facility?
A: Well, it was used in 307 here (indicating). It was used down in Fox Island here somewhere (indicating).
Q: You're pointing to building 77 now, more or less?
A: No.
Q: Okay. I thought you did.
A: I did, but that wasn't the point.
Q: 80 or 82?
A: We're talking about, what, lead azide?
Q: Lead azide.
A: Yeah, it was used in '80 and '82 in detonator production. The girls scooped it. It had

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a little hard rubber conductive container. And they kept filling that and, you know, scooping it.
Q: Now, how did the lead azide arrive at the facility, if you know?
A: I know.
Q: Okay.
A: It was in bags from Pompton Lakes, New Jersey. And it was wet with water. And in the winter it was wet with alcohol and water so it wouldn't freeze.
Q: Can you describe the quantities, say, during World War II of lead azide that came into the facility, say, in a week?
A: Well, I can say that during the gravel mine program was our greatest consumption. And that was used a lot.
Q: A lot? How many?
A: Well, maybe four or five bags a week.
Q: And how big was a bag?
A: I think they were 50-pound bags, maybe 30-pound bags. But they were wet with freon. They came in drums.
Q: Do you know of any raw materials that came to the facility from military bases or facilities

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such as the Aberdeen Proving Ground or anywhere else?
A: Offhand I don't.
Q: Mercury fulminate, where would that have been used at the facility?
A: In detonator production.
Q: And again, refresh us where that occurred.
A: Well, that would be over here (indicating).
Q: We're on Exhibit 4 again?
A: Yeah. 82, 80, those were our primary detonator production hand lines. That's where it would be used.
Q: Building 82 and 80?
A: Yeah.
Q: How would mercury fulminate come into the facility?
A: That would come in also wet. I don't know how that came in. It was in bags. They opened it. We had a guy that did that. That was extremely hazardous.
He had to open the bag and take it out and wash it and put it on trays to dry. And at one time

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we had - the whole dry houses were blown up. We couldn't figure out why.
We had steam lines that went into these dry houses. And the chipmunks used to go in and nibble at the azide, and they'd detonate. All we'd find was a little fur.
Q: Now, buildings 80 and 85 where the detonators were made, were there military inspectors present in those locations?
A: Yes.
Q: During World War II?
A: Yeah.
Q: The Korean War era?
A: Yeah, I would say so.
Q: And the Vietnam era?
A: Gee, I don't know. You're pinning me down to too many eras. I don't know.
Q: Well, whenever detonators were being made were there long periods when there weren't military inspectors?
A: No. They generally took a sample and did a lead output test, which meant they took a lead disk and put the detonator in the holder against it, fired the detonator.

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And it had to make a hole in the lead a certain size. And if it was so big, it passed; if it was not, it was rejected.
Q: If a detonator was rejected would it go down to the disposal area?
A: Yup.
Q: I forget. Detonators that were rejected, were they exploded in Factory Pond?
A: No. Usually we put them on sawdust and burned the sawdust.
Q: Other than mercury fulminate, was there any other mercury compounds that you knew of that were used at West Hanover?
A: No.
Q: Was any arsenic used, to your knowledge?
A: No. We bought silver dollars from Mexico and we dissolved them in nitric acid and made silver fulminate, but I don't - What was your question?
Q: Whether arsenic was used.
A: No.
Q: Zinc? Was there any zinc?
A: Zinc? I don't recall any, per se.
Q: How about copper? Was copper used in the production?

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A: Yeah, we used a lot of copper cups.
Q: For what?
A: For making detonators. Here is a cup. You put the explosive in, press it, put a disk on it, crimp it over, size it, paint the end red and you have a detonator.
Q: How about any chromium materials, were they used?
A: I'm not familiar with chromium being used.
Q: Explosive materials that were used. You've mentioned RDX?
A: Yup.
Q: What other explosives were used in producing munitions?
A: Tetryl, TNT, pentaerythritol tetranitrate.
Q: That's a tough one.
A: Don't ask me to spell it. PETN will do.
Q: Was it called PETN?
A: Yeah, that was their abbreviation. I can't think of any others.
Q: Was there an explosive called MOX?
A: Yup.
Q: What was that?
A: That was a metal oxygen-bearing explosive

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that was developed at our plant. And we used it in 20 millimeter. And we claimed that it was more powerful than any other explosive that was currently being used.

And we would set up a target of aluminum panels and set off a detonator, 20 millimeter, and it would – ordinary explosives.

And then we would detonate one with MOX in it. And MOX were generally more powerful. It would blow all the panels off. We'd say, "See, that's better."

Q: What metal was used in MOX?

A: Aluminum, I guess. Yeah.

Q: Did the military inspectors direct how chemicals would be stored, for example, at the facility?

A: Well, they would check. And if they didn't meet their approval, they would, you know, say, "Hey, you can't store that stuff like that."

We had magazines with lightening arresters on them. And they were all wooden lined. And they had conductive rubber floors and generally met the codes for detonator – for magazines.

Q: Were the military inspectors involved,

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Q: Do you know what decade that would have been in? The '50s, '60s?

A: No, I can't tell you.

Q: After 1945?

A: Yeah, right. We had the – We had a manager who would promote these various developments, and he would – He had friends in the bureau.

Q: The Bureau of what?

A: Of Ordinance.

Q: The Bureau of Ordinance?

A: The Navy Bureau of Ordinance. And he'd go down there and tell them, "Look, we got a round that's better than this and better than that."

And the resin Naval guys in the labs didn't like this because it made them look like they didn't know what the hell they were doing. And sometimes they were right. But generally they supervised the use of these chemicals.

Q: The Naval inspectors?

A: Yup.

Q: Did the Naval inspectors oversee in any way the research and development projects?

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say, during World War II in accounting for the amounts of various materials that came into the facility and what was done with them?

A: I really don't think so. I think that was our responsibility.

Q: Were the military inspectors involved in determining whether finished products that were produced by National Fireworks were acceptable?

A: Yes.

Q: Would that be true of all of the different munitions products that were made at the facility?

A: Pretty much so if they were government, either the British or the Canadian or the American Army.

Q: We've talked about products that were made. Were you involved in any research and development efforts at West Hanover?

A: Yeah.

Q: Can you describe some examples of that?

A: Well, I worked on the development of MOX explosive in 20 millimeter.

Q: Was that after World War II?

A: Yeah. We had a contract with the Bureau of Ordinance.

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A: No. That was our responsibility. But if we had something to test and we wanted a witness, they would witness it for us.

Q: Okay. So the – Is it fair to say that the inspector's primary role was in overseeing munitions that were actually in production at the facility?

A: Yeah.

Q: Okay. Now, what was the role of the military inspectors in testing of products at West Hanover?

A: Well, if you had a detonator lot that had to be tested, they stood there and watched you do it and checked those disks with holes in them, measured them, said, "This is no good" or "This is good."

Q: Where were detonators tested at this facility?

A: In a building in the main plant. I don't know as I can find it. They were tested over in here somewhere (indicating).

Q: Over in here. You pointed to somewhere around 74, 43?

A: Yeah.

Q: 38?

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A: Yup.
Q: Okay. Was that just detonators that were tested there? Was anything else tested in that location?
A: Normally detonators.
Q: Okay.
A: We had these steel boxes with doors. And they'd open the doors and put the detonator in there with this disk and then close it and then detonate it and then measure the disk.
Q: Okay. What other products were the military inspectors involved in testing at West Hanover besides detonators?
A: Primers, bouchon fuses. We made fuses with delay compound for the hand grenade. You pull the pin and throw it.
And several contractors down south got careless, and they didn't put the delay pellets in those bouchon fuses so when you pulled the pin and threw it you lost your hand.
So there was a big investigation to see if we were involved. We weren't.
Q: In terms of the primers, where were they tested?

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A: Usually in that same area.
Q: The area you just described for detonators?
A: Yeah. I don't know the name of that building.
Q: Somewhere near 43 here south of F Street?
A: Where is the main gate?
Q: Is that off Winter Street up here (indicating)?
A: No. Down here somewhere (indicating).
Q: Down by the administration building?
A: Those detonators were tested in this area here (indicating). I can't read it. Is that 65 or 165?
Q: It looks like 165 or 166 on Fifth Street.
A: Yeah.
Q: You were mistaken when you were pointing down here off of F Street at 43 and 74?
A: Yeah.
Q: How about primers?
A: Same deal.
Q: The same deal. 166 on Fifth Street?
A: The primer tests were the same, but sometimes they used a detonator to initiate them.

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Q: Okay.
A: It was all called out in the military spec.
Q: The specifications?
A: Yeah.
Q: How they should be tested?
A: Right.
Q: In each instance for the primers, the detonators, the fuses, did they sometimes fail the tests?
A: Yes.
Q: Then what would happen?
A: We'd argue about it.
Q: With the inspectors?
A: Yeah.
Q: And if the – If you lost the argument –
A: We destroyed them.
Q: Would you destroy the entire lot that they came from?
A: Yeah.
Q: In each instance, primers, detonators, fuses?
A: Sure. Yeah.
Q: Was that a fairly routine occurrence that

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a lot would be rejected?
A: Not routine, but occasionally we had a lot that wouldn't pass.
Q: On a weekly basis would a lot of something be rejected at this facility?
A: Well, maybe, but not too often.
Q: Then they'd go to the disposal area?
A: Right.
Q: Were there particular people who were responsible for disposal?
A: Yes.
Q: Who were they?
A: Pierce was one of them.
Q: Richard Pierce?
A: Yup.
Q: Do you know anyone else?
A: Bill Dogett. He's dead. Let's see. There were a few others.
Q: Mr. Osborne?
A: No. Pat was – He didn't – He was in charge of safety for a while, but he wasn't a disposal man.
Q: Okay. The disposal people, were they stationed down here at the southern end of the

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facility?
A: Yeah. Down in the dump. They had a building down there. And they used to sit there and, you know, tell war stories.
Q: You've described rejected munitions that were disposed of by burning or detonating.
A: Yeah.
Q: Were there any wastes from the production process at West Hanover that were disposed of by burying them down in the southern end of the plant?
A: Not - The only ones I knew of were the Arthur D. Little pit. And sometimes they put stuff in there and didn't - it wouldn't detonate. It was a chemical or something.
Q: Were there ever any drums of any type of waste from the National Fireworks operation that would be buried or dumped?
A: No, not to my knowledge.
Q: How about general plant trash, floor sweeping?
A: That was taken down to the dump sometimes twice a day and burned.
Q: Were there any liquid wastes of any type that were generated from any of the production

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processes here?
A: I can't really think of any.
Q: Did you ever get trichlorethylene that got so dirty you couldn't recycle it any more?
A: Once in a great while. It would be taken from the degreaser and disposed of down in the dump.
Q: In a drum, for example?
A: Yeah, they might take it down in a drum.
Q: Do you know what they did with those drums?
A: Dug a pit and poured it into the pit.
Q: Would there ever have been an occasion where there was waste freon solvent?
A: Yes, but that was a highly volatile solvent and it would, you know, usually evaporate if you left it out. Of course, if it was contaminated with azide you had to burn it.
Q: Does freon burn?
A: I don't think so, no.
Q: Were you -
A: But the azide in there would. And that was one way of getting rid of it.
Q: Were you aware of any instances where drums of dirty freon were sent to the disposal area?

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A: I'm not aware of it, but I'm sure there were drums of it.
Q: In the routine production operation would the freon become dirty with lead azide?
A: Yeah.
Q: So in terms - This would be in the mine manufacturing, the gravel mine manufacturing?
A: Yeah.
Q: So that am I correct that that operation would produce a certain amount of waste freon?
A: That's correct.
Q: Any idea of the quantity, say, in a month?
A: Not too much. I would say maybe 20 gallons a month.
Q: That would be sent down to the disposal area?
A: Right.
Q: Do you know of any wastes from production at West Hanover that were sent off the premises, off the West Hanover facility for disposal during your tenure there?
A: Yeah.
Q: What was that?
A: There was some outfit in Hingham that was

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destroying wastes at sea. And they would barge it out and then dump it in the ocean.
Q: Did that occur during World War II?
A: Yeah.
Q: Do you know what wastes those were?
A: No.
Q: Did it occur -
A: It wasn't - It wasn't prevalent. We didn't - We hired this outfit two or three times, and then we did our own destroying.
Q: To your knowledge, did the military inspectors or specifications or manuals have any requirements about how the waste should be disposed of?
A: I'm not sure, but I know there are many manuals that deal with handling explosives. And one of them is TM 92900. That dealt with handling explosives, and it might be that that talked about destroying them. I don't know.
Q: Was the disposal of waste from production of munitions, to your knowledge, governed by military manuals at West Hanover?
MR. DERTKE: Excuse me. I'm going to object to that. I think he wasn't involved in the

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actual disposal.
Q: Do you know if the disposal process at West Hanover was governed by military manuals?
A: No. We had our own procedures and our own people to do it.
Q: Were you aware of any limitations on taking munitions waste off the premises at West Hanover?
A: No.
Q: You weren't aware of any?
A: No.
Q: Do you know –
A: All of it, to my knowledge, with the exception of those two deep water incidents, were down at Hanover or at the dump.
Q: The dump at West Hanover –
A: Right.
Q: – that we've talked about before?
A: Well, yeah. Right.
Q: Do you know if any branch of the U.S. military during your tenure at West Hanover ever owned any buildings?
A: No, I don't.
MR. DAVIS: Off the record.

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THE VIDEOGRAPHER: Off the record at 12:06.
(Lunch recess)

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AFTERNOON SESSION
THE VIDEOGRAPHER: We're back on the record at 1:03.
BY MR. DAVIS:
Q: Mr. Kent, I think we were talking about whether there were any government-owned facilities when we broke for lunch.
Do you know if there was any equipment that was owned by the government in any of the buildings at the Fireworks site?
A: I don't really – I can't think of any. It's possible. We furnished most of our own test equipment.
Q: Do you know –
A: The government – On the hand grenade deal, the government loaned us an x-ray machine that x-rayed the columns of delay in the bouchon fuse.
And that was set up by the government. The guy came down with a radioactive source and put it in, and then he would periodically test it to see that it was functioning all right.
And because – Some of these contractors left the delay comp. out of the fuse, and when you threw it it went off immediately and killed you and

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whoever else was around. So they wanted to stop that. And they did effectively minimize that.
Q: So am I correct there was a government inspector stationed at the Fireworks site responsible for checking these grenade fuses?
A: That's correct.
Q: During what period was that?
A: Well, let's see. I don't know.
Q: World War II?
A: Yeah, I'd say so.
Q: Continuing after World War II?
A: No, I don't think so.
Q: Do you know if there were any buildings or equipment that were paid for by the government, say, during World War II at the facility?
A: No, but I wouldn't be surprised by what – The government paid for a lot of it in one way or another.
Q: But –
A: Let's say no.
Q: You don't know?
A: No.
Q: Someone else might know that?
A: Would know, right. Wolfert would know

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that.
Q: Who is Wolfert?
A: He's somebody that you already interviewed. Not you. Somebody else in your gang.
Q: Okay.
A: He was factory manager for a period at West Hanover.
Q: Okay.
A: And he knew a lot about the finances.
Q: Okay. Was he the plant manager or supervisor, to your knowledge, during World War II?
A: Yeah.
Q: Did you report to Mr. Wolfert?
A: Sometimes.
Q: Did you deal with him on a frequent basis?
A: Yup.
Q: In what regard?
A: Well, I was chief engineer for a period. I dealt with him then. And I dealt with him on everyday problems of the running of the plant.
Q: Okay.
A: I can't think of anything else.
Q: What was the highest position that you had at the West Hanover facility?

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A: I was deputy director. That sounds like a big – That was just a made up title.
Q: What did it mean?
A: It means nothing.
Q: What did you do?
A: Nothing. No.
Q: Seriously.
A: I was running the plant. I had a lot to do with the everyday problems.
Q: And your affidavit, which is Exhibit 2, in paragraph 5 states, "From 1955 to 1970 I was plant manager of the facility." Is that what you're referring to?
A: Yeah.
Q: Why don't we refer to your recent affidavit here starting with paragraph 8. I'm going to read a few sentences from it and see if you agree with them today.
A: All right.
Q: I'm going to start in paragraph 8. "Mercury fulminate was a common primary explosive used predominantly during World War II." Do you agree that's true?
A: Oh, yeah.

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Q: Next it says, "Lead azide was used primarily during the Vietnam War era." Do you agree that that is true?
A: Yes, I do.
Q: You also testified it was used earlier, as early as World War II; is that correct?
A: Yeah.
Q: Both mercury fulminate and lead azide were used only in the production of munitions for the U.S. government. Do you agree that that's true?
A: That's correct.
Q: Next, "The use of mercury fulminate significantly declined after World War II because the production of munitions that used mercury fulminate declined." Do you agree with that?
A: Right.
Q: Paragraph 9 describes – of your affidavit, if you could look at that, states, "The United States supplied most of the explosives and some other materials," and it lists several. Do you agree that that is true?
A: I don't know as it is completely true. I believe we made our own black powder in a stamp mill.

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Q: Okay.
A: And freon was supplied by Dupont. We paid for it. Smokeless powder was purchased from the Naval propellant plant.
Q: Tetryl?
A: That was a high explosive. And that was bought by us.
Q: From?
A: I don't know who we bought it from. Maybe one of the arsenals – government arsenals.
Q: Do you recall any other materials that were purchased from government arsenals or government-owned plants?
A: Well, if we were making an item that used a primer it was made by somebody down in Georgia because they had cheap help and poor safety. We'd often buy from them.
Q: I'm talking about the ones that came from a government plant or a government facility as opposed to a private company. Can you recall anything else that came from a government armory?
A: Not offhand.
Q: Okay. Do you agree – I'm now focusing on the last sentence of paragraph 9, "The United States.

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government regulated and accounted for all explosives that it shipped to the facility"?
A: That's correct.
Q: You state in paragraph 12 of your affidavit that, "Government inspectors had the power and authorization to stop production at West Hanover at any time"?
A: Yeah.
Q: Was that true from your experience?
A: Yup.
Q: Can you recall any instances in which a government inspector directed that production be stopped?
A: No, I can't, but...
Q: Did you understand that they had the power?
A: Oh, yeah.
Q: And how did you know that?
A: Well, it was in the contract.
Q: It was in the various contracts?
A: Yeah.
Q: One more reference to this document. Look at paragraph 14. It talked about off specification products being disposed of.

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The second sentence says, "During my employment at the facility mercury fulminate was disposed of either by exploding it in Lilly Pond or spreading it on a layer of sawdust on the ground and setting it on fire."
The first question I had is - Now we're going to refer to Exhibit 4. Could you point out Lilly Pond?
A: Right here (indicating).
Q: Do you recall disposal of any munitions waste into Lilly Pond?
A: Not specifically, but I'm sure it was used for that purpose. This general area was all underwater facility that was - They detonate explosives in the pond to cut down on the noise.
Q: By "this general area," you're pointing to the left or southwestern portion of Exhibit 4 which included Factory Pond and Lilly Pond?
A: Yeah.
Q: And those are connected, aren't they?
A: Yup.
Q: Is that the Lilly Pond you were referring to in your affidavit?
A: Yeah. I'm referring to this general area

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(indicating). That's what we used for demolition.
Q: How did the National Fireworks facility determine how much of a particular munitions product to make? Let's say 20 millimeter shells.
A: Well, first of all, we get an invitation to bid from a certain arsenal. Picatinny, that's a good example.
Q: Picatinny Arsenal?
A: Yeah. They'd want us to, you know, bid on making 100,000 rounds of 20 millimeter, for instance.
And so we'd prepare a bid. Materials, labor, the whole works. And we'd cost it out, come up with a price.
And then we'd all sit around the table and say, "Well, that's too high." And then someone would say, "Yeah. We'll never get it at that." And we'd dicker around. We'd talk about it.
And then sometimes we'd all write our price on a piece of paper and put it upside down so nobody could see it, and then after the bids were open we'd look and see who was close. And if you were a winner, you wondered, What in hell did I do wrong?

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Q: Do I infer from that the level of production was determined by the contracts you got from the military?
A: Yeah, absolutely. It was a vicious process. You bid against five or six other contractors. They were down south. Their safety was terrible. They didn't have good facilities. They had many fatalities, and yet they expected us to run a tight ship, you know.
Q: Was this facility successful in continuously getting contracts from the military?
A: Yeah.
Q: Through World War II?
A: (No verbal response)
Q: How about the Korean War?
A: I think we got some from Korea, yeah.
Q: And the Vietnam War era?
A: Yup.
Q: Did each of these contracts include specifications for the products that were to be made?
A: Absolutely.
Q: Okay. Did the National Fireworks facility produce munitions that were not required to fulfill

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government contracts? Did they make them for any other reason?
A: Not that I know of. We were all government oriented.
Q: We talked at some length about disposal of off specification materials.
A: Right.
Q: Do you recall any spills of freon at the facility?
A: Yes, I do.
Q: Could you describe what you recall.
A: It seems to me I heard we lost a whole tank of freon. I've forgotten. I think somebody left the cock open or something. And that was hard to explain because freon was expensive. We had to pay for it ourselves.
Q: Okay.
A: But in the general run of the mine project, we used quite a bit of freon just for everyday safety because if the mines were wet with freon they were safe to handle, presumably.
Q: Well, I have an exhibit that I'll show you.
MR. DAVIS: We'll mark this Exhibit

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5.
(Exhibit Number 5 marked for identification)
Q: If you could look that over for a moment.
(Pause)
Q: This document on the first page of Exhibit 5 refers to a loss on July 27, 1966 of approximately 49,000 pounds of freon.
A: I think that's the incident I mentioned.
Q: Now, this document says it is from the United States Army, Picatinny Arsenal, Dover, New Jersey. Is that a government installation with which you dealt?
A: Yes.
Q: It is directed to the Atlantic Research Corporation on King Street in West Hanover, Mass.
A: Yes.
Q: Was that the company that was operating its facility in 1966?
A: Yup.
Q: So this document describes the freon spill you were talking about?
A: I don't know. It looks like it. Can you interpret it for me? What does it mean? Somebody

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left a pipe open and we spilled a lot of freon.
Q: I didn't work there, so...
A: Yeah, but you're a lawyer.
Q: It's not my deposition, though.
A: Okay. I do recall some talk of a spill, but...
Q: Attached there is another document called a release. That also relates to this freon spill and payment of $13,000 as full and final settlement for the aforementioned loss of freon. Were you aware of this circumstance?
A: Vaguely. I wasn't directly concerned with the mine program, but I remember there was a loss of freon and a big ruckus over it.
Q: Do you know where the loss of freon occurred?
A: Building 85.
Q: Okay.
A: There was a tank, an external tank storage there. I think that's the tank that leaked or they put a pipe on it or whatever the hell they did.
Q: And what was your understanding of what happened to the freon?
A: It evaporated or spilled on the ground.

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Q: You don't know if it soaked into the ground?
A: Well, I assume it did, but it would eventually evaporate.
Q: Can you recall any other spills of chemicals or solvents at the National Fireworks facility during your tenure?
A: Well, no. That's a big question.
Q: Any smaller spills or leaks that you remember?
A: No. I probably wouldn't be told.
Q: Who would know if there were leaks or spills of chemicals?
A: Pat Osborne might know.
Q: Why would he know?
A: Because he was involved in the hands-on – You know, he worked with the chemicals. He was our primary explosive man, and he had his fingers in a lot of pies.
Q: Was he involved with the handling of solvents as well, Mr. Osborne?
A: Somewhat but, I mean, he was a primary explosives man. He mixed primer mix and delay comp. and that sort of thing.

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Q: We're going to talk to Mr. Osborne, so I guess we'll find out what he knows.
A: He knows plenty.
Q: We'll tell him you said so. Other than wastes that were taken down to the southern end of the facility and disposed of, as you talked about earlier, do you know if there were any septic systems or dry wells or floor drains in any of the production buildings where waste liquids would go?
A: Sure. We had cesspools all over the plant.
Q: Would that be up in the northern production area?
A: Well, all the production buildings presumably had a cesspool.
Q: And other than the sanitary toilets, what would be connected to the cesspools?
A: Just sewage.
Q: Would there be any sinks, for example, in the laboratory that would be piped to a cesspool?
A: Building 295 had its own cesspool. And that was a laboratory.
Q: That was your laboratory?
A: Yeah. I ran that. And all the waste went

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into a big gizmo, and we pumped it out once a year. And it wasn't hazardous.
Q: Okay. Who pumped the waste out of the septic?
A: I think we had a waste truck that pumped it. Either that or we hired somebody.
Q: Do you know what was done with the waste once it was pumped out?
A: Down to the dump and flooded out onto the flat area there.
Q: Okay. Do you know of any other buildings that had cesspools or septic tanks?
A: Many of them.
Q: Okay. Could any waste water from the production processes have gone into the septic systems in any of the buildings? Not could they. Did they?
A: I really don't know, but I don't think so. I mean, we had - They were pretty well-defined.
Q: Were there any processes at the Fireworks facility that produced a waste water?
A: Well, when we got in lead azide Pat Osborne would open those bags up and wash the

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azide. And those tailings would be disposed of at the dump. And then he would take that azide and put it out onto a tray with a napkin and dry it. And when it got dry, he'd chop it up and get it ready to put into individual cups for the girls to scoop into detonators.
Q: I'm focusing on the waste, though.
A: Oh, all right.
Q: Do you know of any other waste waters from the production process that went into pipes that would have gone into any of these rivers or streams?
A: No. We did have a contamination problem with sewage.
Q: Could you describe that.
A: Yeah. There was a laundromat down the line from us on the Drinkwater River, and they complained bitterly that our effluent was contaminating their laundry. And we put in a chlorine system after that to assuage that problem.
Q: Where was the laundry referring to Exhibit 4? Was it off the map on the Drinkwater River?
A: Yeah. It wasn't on our property. It was down the line.
Q: Down - Which way is down? South?

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A: Well, let's see where that laundry is.
Q: Let's find the river. Here is one branch (indicating). Here is the other branch (indicating).
A: Well, they'd say that the effluent from the laundry was contaminated by our sewage. And we put in a chlorination system to clean it up.
Q: This laundry was somewhere downstream of the National Fireworks site on the Drinkwater River?
A: Yeah.
Q: How did this sewage get into the river?
A: Leakage from cesspools.
Q: Do you know where these cesspools were that leaked into the river?
A: No.
Q: Would it have been somewhere in the general area of the production area up at the northern part?
A: I think it would be down near the lower end and somewhere in here (indicating).
Q: Okay. Were you aware of any other instances of water pollution that resulted from the operations of the National Fireworks facility?
A: Well, I was aware that we put tetryl

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tailings from our 20 millimeter line into the swamp in back of building 307.
Q: Okay. Now, here in Exhibit 4, by "in back of building 307," do you mean -
A: Away from the plant.
Q: That would be west or toward the river?
A: That's it. You got it right in here (indicating).
Q: You're pointing to the area left or west of building 307?
A: Dr. Storm was concerned that we were putting so much tetryl into that waste place there that it might pay off to dig the tetryl out and recrystallize it. I said, "At 76 cents a pound, Doc, we aren't going to do it."
Q: Who was concerned about that?
A: Dr. Storm. He was the first man to distill nitroglycerin.
Q: To distill it?
A: Yeah. Brave man.
Q: What was his role at the facility?
A: He was an advisor, consultant. He worked in Maryland at the Naval Powder Factory. A smart guy.

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Q: Were there any other instances of land or water pollution that you are aware of at the facility during your tenure?
A: No, but I'm - I don't know. I can't recall any.
Q: Were you aware of any, other than the freon spill and this tetryl disposal at building 307 - any locations where the soils were contaminated?
A: No.
Q: Did you know of any oil spills or leaks?
A: No, I didn't.
Q: Or other chemical spills of any kind, even if they were small?
A: No, I didn't.
Q: We started to do this before, but I'd just like to make sure we identified each of the government organizations that were customers of the National Fireworks facility. Can you name all the ones you can recall.
A: Well, the U.S. Army, Picatinny Arsenal.
Q: And what products mainly?
A: We did development work for them. We made detonators. We made charges for them. We made a

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lot of things for them. And then there was the Navy. We made 20 millimeter for them in big quantities. We had 10, 12 plants.
Q: I'm talking just West Hanover now. That's all we're talking about today.
A: Okay. Navy.
Q: Anything else besides 20 millimeter for the Navy?
A: No, I don't think so. And then we made stuff for the Chemical Corps.
Q: What types of things?
A: Incendiary grenades. That's primarily it.
Q: Any work for the Air Force?
A: Yes.
Q: What was that?
A: We made an underwater destructor for the Navy.
Q: The Air Force?
A: I mean the Air Force. Yeah, we did. They - We built an underwater mine that they put in the rivers over in Vietnam, and it would blow up whatever.
Q: Okay. So that must have been in the '60s?
A: Yeah. It was later on. And that was

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supervised by the Bureau of Ordinance in Washington, the Navy department - the Air Force, I mean. They had their own guys up there. And they wanted us to put in a pert system. Does that sound right? It's when you trace everything back to the screw that goes into the gizmo.
Q: Pert chart, P-E-R-T?
A: That's right.
Q: A management system.
A: Yeah. That gave me a headache. God.
Q: So are you testifying that the Air Force had inspectors who were involved with that mine project?
A: Yes.
Q: That were in West Hanover?
A: Yes. They weren't there all the time, but they would periodically come up from Washington.
Q: Anything else for the Air Force that you know of that was made at West Hanover?
A: No.
Q: Any R&D projects for them?
A: Not to my knowledge.
Q: The Bureau of Ordinance, anything else for them?

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A: Yeah, we did something for the Navy department Bureau of Ordinance, right?
Q: You tell me. I don't know.
A: It was the Navy department Bureau of Ordinance.
Q: Can you recall what type of product or R&D?
A: Gosh, I can't. It was – Boy, I can't.
Q: The Chemical Warfare Service.
A: Okay.
Q: What did you do for them?
A: We made – Let's see. Well, we made incendiary grenades.
Q: Okay.
A: We made – I think that bouchon fuse was made for the Chemical Warfare Service.
Q: Who were the gravel mines made for?
A: They were made for the Picatinny Arsenal.
Q: The Army?
A: Yeah.
Q: The Bureau of Weapons?
A: Well, I don't know what we did for them. They weren't a very big – Do you know?
Q: No, not as I sit here.

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A: I don't either.
Q: I'm not trying to trick you.
A: No. That's all right.
Q: Was there any type of a school or a facility for military inspectors ever in operation at the National Fireworks site?
A: Yeah.
Q: Could you tell us about that?
A: Yeah. In the early days of the war –
Q: World War II?
A: – World War II we set up a school for officers and general people in the Navy. And they'd troop up to our plant. We had a regular classroom. We had guys that would lecture them on various weapons and so forth.
In fact, we had one guy that copied a lot of classified drawings and issued it out in a pamphlet with our name on it.
Geez, the War Department got ahold of that and said, "Hey, you guys can't pass this out." This guy was an Englishman, H.P. Oldham.
And so they called him on the carpet and said, "Get all these back and we'll destroy them."
Q: The inspector school, how long did that

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exist?
A: Probably a couple of years.
Q: Just during World War II?
A: Yeah.
Q: Did any of the inspectors who were trained there, to your knowledge, stay on and work at the facility?
A: Possibly. We had so many. I can't vouch for who stayed and who left.
Q: Are there any particular inspectors who you can remember today by name?
A: Yeah. Yup. Marshall Hennault.
Q: Who did he work for?
A: He worked for the Army. He was a resident inspector.
Q: During what period?
A: Early stages of the war.
Q: World War II?
A: Yeah.
Q: Any other inspectors you can remember?
A: Oh, there was a lot of them. Oh, I remember one. Gilotti. He lives out here on the Cape somewhere. What is his first name? I think Charlie Gilotti.

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Q: To your knowledge, he is still around?
A: Yeah. You could get ahold of him.
Q: What did he do?
A: He was an inspector.
Q: For what service?
A: The Army.
Q: Was he civilian or military?
A: Civilian.
Q: During what period?
A: I don't know, but he worked for Marshall Hennault.
Q: Can you think of any Navy inspectors?
A: Not offhand.
Q: If you think of any will you tell me?
A: I think the guy that put that pert system in.
Q: He was the Air Force?
A: Yeah. Boy, I couldn't stand him. He was on my back every minute.
Q: Do you remember any other inspectors, whatever service they might have been with, post World War II, Korea or Vietnam?
A: Well, I remember a guy named Gerrier. He was an Army inspecter.

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Q: Gerrier?
A: Cliff Gerrier.
Q: Any idea how you spell that?
A: G-E-R-R-I-E-R, I think.
Q: Okay. When was he there, more or less?
A: I don't know, but he lives over in Bridgewater somewhere or did if he is still alive.
Q: Which service was Mr. Gerrier with?
A: He was with the Army.
Q: During what period of time?
A: Well, I can't tell you. I don't know.
Q: Are there any other inspectors that you know of that are still around here?
A: No. Most of them are dead.
Q: How about any other employees of National Fireworks or its successor companies who are still around that you know? You've mentioned Mr. Wolfert, Mr. Osborne. Anybody else?
A: No. They're the survivors.
Q: Richard Pierce?
A: He's a bad survivor.
Q: What do you mean by that?
A: Well, he gave us a lot of trouble.
Q: How so?

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A: He'd set off these big charges down in our disposal area, and it would shake the neighborhood, break dishes. We'd go down there and say, "Hey, what the hell are you doing?" He'd say, "I didn't do anything."
Q: Do you know of any instances in which a government inspector directed that a production process be changed?
A: Not really.
Q: You just don't recall that happening?
A: Well, it would either be changed because of a spec change. You know, it wasn't something you did arbitrarily.
Q: Do you know if any military personnel were ever involved with any labor or employment issues at the facility?
A: Gee, I don't know. I don't – We had a union. And the union guy was pretty much under our thumb. He didn't give us too much trouble.
Q: Well, I believe there was a strike that was reported in the newspapers during World War II. Do you recall one?
A: Vaguely.
Q: Do you know if the government had anything to do with getting the facility back running?
A: Well, I remember they were going to have a union election. They called for an election. And they had him. They couldn't get enough people to go for the union, so it petered out.
Q: Do you know if the government was at all involved with hiring employees at the facility?
A: Just their own.
Q: Or deciding how many employees were necessary to make the products?
A: Well, I think that's a decision that they had to make.
Q: Who is "they"?
A: The government employees. If they had a certain line to inspect and a certain number of inspections to do, they had to figure out how many people they needed.
Q: How many inspectors?
A: Yeah. And put a requisition in for it.
Q: Was there anything that military employees did at the facility other than work as inspectors?
A: No, I can't think of any.
Q: Did uniformed military officers during World War II ever come to visit the facility?

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A: Yes.
Q: What floor?
A: Well, first of all, we had a British guy there. We gave him a car. He was a commander in the British Navy, and he was the biggest pain in the ass I ever did see. But he had a car, and he had plenty of amenities.
Q: I guess I'm referring to U.S. military personnel, uniformed personnel. On what occasions did they come to the facility, let's say, during World War II?
A: Many of them came on inspection tours or whatever. If we had trouble with a certain item, they might come down to look at it and decide what to do.
Q: Can you give an example of an instance that you're aware of a uniformed military personnel had come to the facility to deal with some problem during World War II?
A: I can't, but boy we had plenty of them.
Q: They came frequently?
A: Quite frequently, yeah.
Q: Now, what services were they from?
A: Well, Army and Navy. Those were the

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primary ones. The Chemical Corps because we made incendiary bombs.
We had trouble with the bombs. The first ones were made out of metal, and they didn't burn good. Then we got a magnesium extrusion, and that burned pretty good.
I had a friend who worked for the Chem Corps, and he delighted in grabbing an incendiary bomb when it was burning. He'd beat it on the ground and put it out.
And this was very embarrassing to the visiting dignitaries. But he rectified the situation by getting permission to put a tetryl pellet down in the column of the incendiary mix so you never knew when the burning charge would hit that tetryl charge and blow up.
And so the Germans desisted from beating out the bombs. They didn't do that any more.
Q: When these uniformed military personnel would come to the facility, what would their mission be? Why were they there?
A: Well, probably they were going to look over the facilities, see how they were handled, see what our production was, listen to their people

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there giving any complaints.
Q: They would confer with the military inspectors who were stationed at the facility?
A: Yeah, right.
Q: Were there ever any directives to change the operations based on the visits of the military personnel?
A: Yeah, but we didn't hear about them. In other words, they'd tell their own people. We didn't generally get involved.
Q: But things would change as a result?
A: Well, some, yeah. Not a hell of a lot.
Q: Would you like to take a break?
A: No.
Q: We talked before about military manuals.
A: Yeah.
Q: I'm going to show you a document.
MR. DAVIS: We'll mark this as Exhibit 6.
(Exhibit Number 6 marked for identification)
Q: It is stated at the top, "Technical Manual Number 9-1900, War Department, Washington, D.C., July 3, 1942" entitled, "Ammunition, General." Do

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you recognize that document?
A: Undoubtedly.
Q: Do you want to turn to the second page?
(Pause)
A: Yeah, I'm familiar with this.
Q: The third page entitled, "Destruction of Unserviceable Ammunition."
A: Okay. I'm with you.
Q: Okay. Is this a manual that was used during your tenure at the facility during World War II or part of a manual, I should say?
A: Well, I don't think we used any manuals. I think our people knew what the hell they were doing and didn't have to refer to these manuals.
Q: But when I first handed it to you you said you were familiar with it.
A: Well, I was. I'm familiar with the titles.
Q: Okay. Was this a manual that was on the premises of the facility when you were there?
A: Probably, yeah. Probably Marshall Hennault had a copy.
Q: Did the inspectors use this type of manual?

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A: Well, no, because usually they were told what to do.
Q: By whom?
A: By Hennault or by us.
Q: Well, what were these manuals used for, then, at the facility? Seriously.
A: Well, they were used occasionally when they were needed.
Q: Did these manuals establish the procedures that were used for handling the materials?
A: I doubt it. We had our own procedures.
Q: Do you know if the inspectors made any use or any reference to these manuals?
A: I'm sure they did, yeah.
Q: I'll just show you another one.
MR. DAVIS: We'll call this Exhibit 7.
(Exhibit Number 7 marked for identification)
Q: This one is dated October 1956. It is entitled, "Department of the Army Technical Manual" and "Department of the Air Force Technical Order." The title is, "Care, Handling, Preservation and Destruction of Ammunition."

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A: Yeah.
Q: Have you seen that one?
A: The one I'm most familiar with is TM 9-2900. We didn't generally refer to these. I think our people felt they knew what they were doing and didn't need to refer to these manuals.
Q: Did these manuals, the two I've given you, establish procedures for the destruction of off spec ammunition?
MR. DERTKE: Excuse me. Before you answer I want to interpose an objection to that question. Sorry.
A: I presume so. It said, "Destruction of Ammunition." These pamphlets didn't enter our everyday life. We weren't involved with them.
Q: Do you know if anybody else was, or are you talking for you?
A: I'm talking the plant in general.
Q: And again, why was that?
A: Well, I figure we knew what we were doing. We didn't have to refer to these government manuals. Maybe that's a blatant sort of statement.
I don't recall anybody ever running around the plant with a TM 9 bulletin in his hand saying,

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"We're going to destroy some hand grenade fuses, and here is how we do it." No.
Q: Do you know if off specification munitions were disposed of or handled in a manner inconsistent with these manuals?
A: No idea. We handled them with care. Our safety record was excellent. And I don't think we bothered with them.
Q: Do you know if you were supposed to follow these manuals from the military's perspective?
A: Perhaps we were. I don't know.
Q: I'm going to show you a document dated December 28, 1967 – It has your name on the front of it – entitled, "Appointment of Board of Inquiry."
MR. DAVIS: We'll mark this Exhibit 8.
(Exhibit Number 8 marked for identification)
A: Oh, boy. Oh, boy.
Q: Would you take a look at that.
(Pause)
A: This is from the president of our company.
Q: I didn't ask you a question, but I will.

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What is that document?
A: God only knows.
Q: Well, seriously.
A: It was from my president. It says, "An accidental explosion"...
Q: Could you read it to yourself.
(Pause)
A: I believe this was an explosion in the mine department.
Q: Do you recall the incident that that document refers to?
A: Yes.
Q: What was it?
A: It was an explosion of lead azide in the mine-loading building.
Q: This is the gravel mines?
A: Yeah.
Q: Can you briefly describe what happened.
A: Yeah. The man was – They used to take chunks of azide wet with freon and put them before the girls.
The girls would scoop out and weigh a charge. That charge would be put into the mine and the other ingredients, and it would be stitched up

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so it looked like a half moon.
And those would fit into a circle and fit into a nussile, a bunch of tea bags. And they would be deployed by blowing them out the end of the missile.
So anyway, this – They were loading these mines, and I believe the girl got careless and beared down on the spatula and pinched the azide and caused a detonation.
It blew the guy standing there beside her out the door. I remember he went out the door. And there were two or three other people injured but not seriously. The man that was blown out the door was dead but, you know, accidents happen.
Q: So were you appointed to investigate that incident?
A: I don't know whether I was or not.
Q: Does that document refresh your recollection?
A: Yup. Yeah, he wants me to investigate it. I guess I did.
Q: Do you recall if you were involved in that investigation?
A: Yes. I know the people here. Howard

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Scott, he was our safety director.
Q: I'll show you another document that I believe relates to that same situation.
A: What am I supposed to tell you as a result of this? Am I supposed to read this?
Q: No.
A: Thank God.
Q: You are actually supposed to give it back.
A: Good.
Q: I'm going to show you what we'll mark as Exhibit 9.
MR. DAVIS: This is a document entitled, "Company Private, Atlantic Research Corporation, Board of Inquiry Interim Report, West Hanover Plant, Fatal Accident." It begins, "On December 27, 1967."
(Exhibit Number 9 marked for identification)
Q: Could you please take a look at Exhibit 9.
A: Yeah, I'm familiar with this whole operation.
Q: What is Exhibit 9?

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A: I don't know. It's this exhibit, isn't it?
Q: What is that document in your hands which I'll tell you is Exhibit 9?
A: This one here describes the accident in building 85 that I just mentioned, lead azide in the mining department.
Q: Is that the report of the board of inquiry that you were on?
A: I'm not sure.
Q: Do you want to look at the back of it?
A: Yup.
(Pause)
A: You're not interested in all this detail, are you? I'm familiar with it.
Q: Is that document the report of the committee you were on that investigated the explosion?
A: So far I would say yes, but I haven't looked at all of it yet.
Q: I'm not going to ask you detailed questions about it. Perhaps you could just refer to the last page and see if –
A: All right.

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Q: – see if it refers to you.
By the way, where at the plant did that explosion take place?
A: Building 85. I pointed it out to you here a minute ago.
Q: Yes, you did.
A: Yeah, I'm familiar with all these probable causes.
Q: Have you determined if that was the report of the committee you were on?
A: I believe it was. Let me look at the end and see if there is any – Yup.
(Pause)
Q: Do you ever recall a report from September of 1943 that was called the "Truman Committee Report" that had to do with the National Fireworks facility?
A: No.
Q: You don't?
A: That isn't President Truman?
Q: Well, it might have later become President Truman.
A: No.
Q: You –

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A: Tell me more.
Q: I'll show you a document. Mercifully, I'm not going to ask you to read the whole thing.
MR. DAVIS: We'll mark this as Exhibit 10. It's a legal-sized document entitled, "National Fireworks, Inc., West Hanover, Massachusetts."
The author is a Thomas H. Carroll, Lieutenant Commander, SC USNR, 30 September 1943. Someone has written on the bottom of it, "Truman Committee."
A: Well, the only Truman I ever knew was an ordinance inspector.
Q: Apart from the use of the word "Truman" – Maybe you could look at the document on the first page and see if you have any familiarity with it. It appears to be a report about this facility.
A: Who did this report; do you know?
Q: I am told that it was done by the Truman Committee, but I can't tell you a lot about who they were.
A: It's a pretty thorough report.
Q: Tell you what. Let's trade. I'll give you the same document because I want to ask you

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about a couple things that I've marked with yellow tags on that one that you have.
MR. ARATEN: Can we switch copies?
THE WITNESS: Sure.
Q: I'll refer you to a particular place and ask you a couple of questions. I'm almost done.
A: You mean you are?
Q: I'm almost.
A: Holy smokes.
Q: There is a statement on page 2 on this document. The second page of text says "2" at the bottom. Right in the middle there there is a heading entitled, "Conversion to War Effort."
A: Yup.
Q: There is a statement – There is a very short paragraph that begins with the word, "About" that states, "By 1941 the entire facilities had been shifted to war production."
A: Boy, I don't know who the hell wrote this report.
Q: Let's just focus on the questions I'm going to ask you.
A: All right. It's a pretty good report.
Q: It is a document we got from the

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government archives. I'm just going to ask you a couple specific things.
A: Okay. Go ahead.
Q: That statement that refers to the facility procuring government contracts for loading and assembling ammunition and military pyrotechnics. Again, it says, "By 1941 the entire facilities had been shifted to war production."
A: Not true, but who cares? I went to work there in '41, and they were still making fireworks. There were only two contracts on war supplies. I don't want to beat that one to death. Who cares? Go on.
Q: At some point during World War II is it true that the entire facilities had been shifted to war production?
A: Yeah.
Q: You just don't necessarily agree with this date, '41?
A: No.
Q: Okay. And it lists a bunch of contracts with the Navy that were produced. Page 3 at the bottom.
A: Okay.

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Q: Under this heading Roman numeral II, "Performance, Prices and Contribution," the very last paragraph states, "The contractor," which I take it refers to National Fireworks, "is a very important factor as measured by the fact that it produces 28 million 20 millimeter high explosive incendiary and tracer shells out of the industry total of 40 million per month." Do you know if that's an accurate statement?
A: I wouldn't be surprised. We had eight or 10 plants going all the time, and they were running three shifts.
Q: Okay. This report is titled, "National Fireworks, West Hanover, Massachusetts."
A: Okay. Go ahead. In other words –
Q: I don't know if it talks about other plants or not.
A: It does. It mentions Chillicothe, Bristol, Virginia, Mayfield, Kentucky. I've been to most of those plants.
Q: Okay. Do you know what proportion of the 28 million rounds per month were made at West Hanover?
MR. DERTKE: I'm going to object

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based upon lack of foundation for that figure and his knowledge.
Q: Assuming the 28 million were made by the whole company, do you know what proportion were made in West Hanover?
A: No.
Q: Do you know if West Hanover was one of the larger producers of the National Fireworks plants?
A: Yeah.
Q: Do you know if it was the largest?
A: I don't know, but I assume it was.
Q: Based on what?
A: Based on my knowledge of the plant. It had extensive facilities for pressing 20 millimeter shells. We made all the pellets to load the shells. We made the primers over at American Fireworks. We did it all.
Q: Okay. Actually, looking at the top of page 3, there is a list of number of employees.
A: Okay.
Q: This may be the whole company. It says 31 August 1940, 175 employees. Does that sound like about the number that were working at West Hanover when you arrived?

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A: Right.
Q: And it goes up through 2,052. These are in August of '41. 5,851 in August of 1942. January 1943, 13,354.
Do you know or can you estimate how many of them were in West Hanover?
MR. DERTKE: Objection. Asked and answered.
A: I'd say no, I can't. We were running three shifts. We made a considerable number of projectiles.
Q: That is all I'm going to ask you about that one.
A: These are interesting figures. I've never seen them before.
MR. DAVIS: Maybe we can take a recess now.
MR. ARATEN: We can give him a copy. If you'd be interested, I'd be happy to mail you a copy.
THE WITNESS: Would you? Sure.
THE VIDEOGRAPHER: Off the record at 2:09.
(Recess taken)

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THE VIDEOGRAPHER: We're back on the record at 2:22.
Q: Mr. Kent, I have just a few more questions to follow up on things I asked you about. First, the incendiary grenades that you described.
A: Yes, right.
Q: Could you tell us what materials they were made of?
A: Yeah. It looked like a beer can. The incendiary mix was thermite and an oxidizing agent and (inaudible) on the top, and then it had a hole in it for a bouchon fuse.
That was a regular hand grenade that was used except instead of a detonator on the end it had a pyrotechnic igniter. So you pulled the pin, threw it and it burst into flames and burned copiously.
They used them in Vietnam. They'd fill the tunnels with gas and then they'd throw one of those down in the hole and it would detonate and blow the whole tunnel system up.
Q: What's thermite?
A: Thermite is a mixture of iron filings and – I can't tell you the exact formula, but it was used in the railroad era for welding ties together.
You'd make a mound of thermite over the rails and burn it, and it would fuse. It was used in grenades extensively.
The first grenade was a steel shell, and they'd pack that with thermite. And then it had a streamer on it made of cloth, and that would keep it oriented straight up. And they'd drop that from an airplane. And then they went to magnesium bombs.
Q: The device you talked about that was made for the Air Force, the underwater explosive device.
A: Yeah. That was a mine.
Q: Can you tell us what was in that?
A: I really don't know. It was a top secret. It was used in the rivers in Vietnam.
Q: You don't know anything that went into it?
A: No.
Q: Would freon have been used to –
A: We made the booster for it and we made certain parts of it. I remember I got behind. And they needed these like you know what.
I had to go down to the bureau and go before Admiral Groller. He sat at a desk as big as this room and said, "You're late, boy." And I was.

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Q: This was the Bureau of what?
A: Ordinance.
Q: Of the Air Force?
A: Navy department.
Q: Navy. In terms of these Air Force explosive devices, were you aware of any instances in which the inspectors would reject that as being off specifications?
A: Well, yeah. Those – Let's see. The Air Force items?
Q: Yeah.
A: No, I can't remember any.
Q: By the way, was it part of your job at any time to negotiate contracts with any military branches?
A: Yeah. I never was – We had a contract officer, and he did most of it. Once in a while I would do it on the spot.
Q: With whom would you negotiate on the spot?
A: The customer, like Minneapolis Honeywell. These were all nonmilitary customers.
Q: Did you negotiate with another defense contractor?
A: No, but we did plenty of it. And we had a

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guy named Norris Aikens. He did all the renegotiating.
(Interruption)
Q: Is it fair to say contracting was not a -
A: Not a primary function. I was sales and I was a troubleshooter.
Q: And a chemist?
A: And a chemist.
Q: Was it part of your job to know who owned the various materials that the company was working with?
A: Oh, yeah. You wouldn't think so from the way I answered some of these questions, but I did know most of the contracts. Like, Dupont furnished lead azide at Pompton Lakes.
Q: Do you know where the mercury fulminate came from?
A: No, I don't.
Q: The board of inquiry report here, this Exhibit 9 that you looked at before. At the end is that your signature on, I believe, the second to last page? Not the map.
A: I think it is. Yup.
Q: So you signed the original of that

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document?
A: Right.
Q: Now, the last page, is that a map of building 85?
A: Yes.
Q: Is that an accurate drawing?
A: Very accurate.
Q: Okay. When there was an explosion at the facility was it the practice of the company to conduct an inquiry?
A: Oh, sure.
Q: And to appoint a board of inquiry such as this to determine what happened?
A: Right.
Q: And was it the routine practice of those boards of inquiries to make a written report?
A: I don't know. I haven't - I don't recall any offhand, but they probably did.
In this explosion here there was 15 pounds of azide that went up on that table there, and it blew the man out the door. His body was right here (indicating).
Q: You're referring to the last page of the exhibit, the map?

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A: Yes.
Q: Was it the practice of National Fireworks and its successors to keep reports like that in their files, reports of incidents?
A: Gee, I don't know. I'm sure they did, yeah. The contract administrator probably kept them, but I didn't.
Q: Were such reports kept in the ordinary course of business of the company?
A: Yeah. You should be able to get those, maybe.
MR. DAVIS: I have no further questions at this time.
MR. ARATEN: I have nothing.
MR. BELING: Nothing.

CROSS EXAMINATION
BY MR. DERTKE:

Q: Mr. Kent, my name, again, is Dan Dertke. If you're up to it, we can go right into my questions.
A: Go ahead, Dan.
Q: I'll try to move along as fast as I can and get this finished.
A: That's all right.

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Q: Let me just remind you that you are still under oath. If you don't understand my question, please just ask me to rephrase it. If you don't know the answer, just say that. You don't need to guess or speculate.
A: Okay.
Q: I just want to know to the best of your memory.
A: All right.
Q: When you started as a chemist in 1941 at National Fireworks who did you report to?
A: I reported to John Hawkins, the only other chemist on the premises, and Tenney Davis, the great explosives expert who graduated from MIT and who wrote a book on the chemistry of powder and explosives. I say that somewhat facetiously.
Q: I've seen him referred to as the great Dr. Tenney many times.
A: Have you? He wasn't as great as he made out, but we'll let that lie.
Q: Were both of those gentlemen that you reported to National Fireworks employees?
A: Yes, they were.
Q: Do you know who they reported to?

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A: John Hawkins reported to Harold King. He was the man that hired me. I told him I'd go to work at $25 a week but after three months if he wanted to keep me raise me to $40, which he did.
Q: Was that Kane or King?
A: King.
Q: Was he a National Fireworks employee?
A: Yes.
Q: Was there a chemistry department that you worked in?
A: Yes. John Hawkins and I were the chemistry department.
Q: Were there other departments at National Fireworks at West Hanover when you started?
A: Yeah. We had an inspection department. We had an engineering department. We had a purchasing department. We had an inspection department. That's about all that I can remember.
Q: Did you have a personnel department?
A: Yes.
Q: Did you have some type of safety department? This is just in World War II.
A: I believe we did. I'm trying to think of who functioned as head of safety. In '41 we were

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just getting underway.
We were making fireworks - We were making fireworks still, and we only had two other items. They were military explosively oriented. So we were just on the verge of going from a little piddling outfit to a 12-plant operation.
Q: During World War II after operations had geared up do you recall if a separate safety department was established?
A: Yes.
Q: Do you recall if there was a separate waste handling department?
A: Yes.
Q: Do you recall if there was a separate traffic department?
A: Yes.
Q: Do you remember if there were any other separate departments in the company during World War II after operations had gotten geared up?
A: There was a machine shop. That's about it. A contracts department.
Q: That was separate from purchasing?
A: Yup.
Q: Did all - Were all these - Did all these

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departments consist of National Fireworks employees?
A: Yes.
Q: Were there any government or military people working in these departments?
A: No.
Q: Just in real general terms, what was the contracts department responsible for?
A: Well, let's see. We would write a proposal, issue it to the customer, and then our contract administrator would negotiate the contract.
In other words, more or less or whatever. And the delivery schedule would be called out, if different, and the whole thing would be, you know, defined.
Q: So writing proposals and negotiating contracts were done by National Fireworks employees?
A: Yeah. I did a lot of cost estimating.
Q: Did any government employees write proposals or negotiate contracts?
A: No.
Q: The engineering department, what did they do?
A: The engineering department designed

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machinery, tools and equipment for loading detonators and primers and whatever else we were making.
That was a small department. In fact, I was head of it for a while, about six or eight men.
Q: Were there any government employees in that department?
A: No.
Q: Did any government employees have responsibility to design machine, tools and equipment?
A: No.
Q: What about the purchasing department, was that all National Fireworks employees?
A: Yes.
Q: And what did they do?
A: They did purchasing and bought tools and equipment.
Q: Did they buy any kind of raw materials?
A: Yeah.
Q: Were there any government employees in the purchasing department?
A: No.
Q: Did any government employees buy tools or

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equipment or raw materials?
A: No.
Q: The personnel department, were they in charge of hiring and firing?
A: Well, let's see. This is purchasing?
Q: I'm sorry. Personnel now.
A: Personnel. Yeah, they did some hiring, but mostly it was done by the department heads. And they'd send the paperwork to the personnel department.
They'd do a checkup on the applicants, see if they were okay. If so, they'd say, "Hire him" or "Fire him."
Q: Did any government employees do the paperwork you described like checking on applicants?
A: No.
Q: At one point in World War II a safety department was established?
A: Right.
Q: What was their basic responsibility?
A: They were responsible at West Hanover for all the safety operations in the plant, the handling of explosives, the production of detonators or whatever. And we even trained some of our employees

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in the safety aspects of the job.
Q: Were there any government employees in the safety department?
A: No. Wait. They had - Yes. They could advise us, but they couldn't have any, you know - couldn't hire or fire or any of that.
Q: Did any government employees actually handle explosives or production of detonators or any of the other tasks you've just identified as the safety department's responsibility?
A: No.
Q: It was just National Fireworks?
A: Right.
Q: You said at one point a waste handling department was established?
A: Right.
Q: What were they responsible for?
A: They went around sometimes twice a day to all the buildings that were using explosives, collecting the waste. They took it down to the dump and either burned it or buried it or detonated it or whatever.
Q: Is it fair to say that the safety department handled explosives in the production

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phase and the waste handling department handled it in the waste phase, or am I misconstruing their responsibilities?
A: Try that again on me.
Q: You said the safety department was responsible for handling explosives.
A: Well, that isn't really true. They didn't handle any. They advised on the techniques of handling them.
Q: This is National Fireworks's safety department?
A: Right.
Q: Was there a separate production department that actually handled the explosives?
A: Oh, yeah.
Q: And they were Fireworks employees?
A: Yeah.
Q: So the production department actually produced the munitions?
A: That's correct.
Q: The safety department advised on safe handling?
A: Right.
Q: And the waste handling department was

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responsible for getting rid of the waste?
A: That's correct.
Q: Those were all National Fireworks employees?
A: Yup.
Q: The traffic department, did National Fireworks have a fleet of vehicles?
A: Yes.
Q: In World War II?
A: Yes.
Q: And was the traffic department's responsibility overseeing those vehicles?
A: Yup. We had a lot of trucks. We had tractor trailers, you name it.
Q: The machine shop, was that staffed entirely by National Fireworks employees?
A: Yes.
Q: What were their responsibilities?
A: They made tools and equipment for the detonator lines. Some of them we bought outside, but most of them we made in the shop.
Q: Did any government employees make tools or equipment?
A: No.

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Q: Looking from World War II forward in time, do you remember if there were any other departments that we haven't talked about that became established at the site?
A: Not offhand. I think we've covered them.
Q: The titles might have changed, but the responsibilities you've described are the same?
A: Yeah.
Q: You mentioned that you took a course at MIT about powder and explosives?
A: Yeah.
Q: Do you remember when that was?
A: Maybe '42 or three.
Q: Pretty early on?
A: Yeah. It was given by a guy named Dr. Thompson. It was a good course. I worked for a guy named Dr. Tenney Davis, and he didn't care for Thompson because Thompson was kind of, you know, doing the same thing.
Q: A bit of an academic rivalry?
A: Right. You got it.
Q: You also mentioned you took a management course at Michigan. Do you remember when that was?
A: No. I don't. I took another one at

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Harvard Business School, too.
Q: Do you remember when that was?
A: Nope.
Q: You mentioned that National Fireworks had auxiliary companies in other towns besides West Hanover.
A: Well, we had a magnesium grinding plant in West Hanover, I guess it was. Yeah.
Q: And was that magnesium grinding plant – Let me rephrase that.
What department ran that magnesium grinding operation?
A: It had its own manager and quality department.
Q: Did –
A: And it was – It did its own thing.
Q: Was that staffed exclusively with National Fireworks employees?
A: Yup.
Q: Which –
A: We called that plant Pilgrim Ordinance Works.
Q: So that was not at West Hanover?
A: Well, adjacent to it. I don't recall just

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where the division line was.
Q: Let me show you one of the maps for a second and see if we can pin down the location.
This is Exhibit 3. I'm directing your attention to the top of the exhibit, which is east. It's got some words there. Can you read the words?
A: Sure. "Magnesium Powder Area."
Q: Does that refresh your recollection as to whether there was any magnesium operations at West Hanover?
A: Oh, yeah.
Q: So there were?
A: We made 5,000 pounds a day.
Q: Just talking about the operation at West Hanover.
A: Right.
Q: Did National Fireworks get magnesium rods?
A: Yes.
Q: Do you know where they got them from?
A: Down in New Jersey somewhere. They were extruded about an inch and a quarter in diameter.
Q: Do you know if National Fireworks bought those rods?
A: Yeah.

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Q: And then did the company grind the rods to make powder?
A: Yup.
Q: That was all company employees?
A: Absolutely.
Q: And was that powder sold?
A: Well, we used it.
Q: Did you also sell any of it, or did you use it all inside?
A: I think we used most of it.
Q: You used it in your own operations?
A: Yeah.
Q: You mentioned at one point that you were a sales manager.
A: Yup.
Q: And you visited customers. Did you get to travel a lot?
A: Yeah.
Q: You mentioned one company was Minnesota Honeywell.
A: Yeah.
Q: Was that in Minnesota?
A: Yeah.
Q: Do you remember any other companies you

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visited?
A: Oh, boy. Let me think. Well, I went to Picatinny a lot and I went to Minneapolis Honeywell.
Q: Let me ask it this way: Do you remember any other places across the country that you visited as part of your job?
A: Places, yes. I went to – Boy, I got to get my mind sharpened up here. Yeah, I used to go everywhere. Yuma.
Q: Arizona?
A: Yup. I used to go to – You name it, I've been there. Almogordo, New Mexico.
Q: Do you remember – I'm sorry.
A: Go ahead.
Q: Do you remember if there was a private company you were visiting in Yuma?
A: No. We were proofing rounds in Yuma.
Q: So it was a test range?
A: Yeah.
Q: Same true for New Mexico?
A: Yeah, I would say so.
Q: You mentioned that one of the products made at National Fireworks in West Hanover was the 60 millimeter illuminating rounds. You said you

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were the low bidder out of five or six bidders?
A: Yeah.
Q: Was that a – That was a competitive process?
A: Yeah.
Q: Did you want that business?
A: Yup.
Q: The company wanted the business?
A: Sure.
Q: So they bid on the government contracts?
A: Right.
Q: And apart from contracts directly with the United States government, the company also had contracts with private companies?
A: Yeah. Minneapolis Honeywell.
Q: So you sold directly to Minneapolis Honeywell?
A: Yeah.
Q: Do you remember if there might have been other private companies and you just can't remember the names?
A: That's correct.
Q: Was all the production work done at National Fireworks that was done for the government

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performed pursuant to these contracts?
A: Yes.
Q: And were these contracts negotiated with the government?
A: Well, usually they were bid, and the lowest bidder got the job. And then they had an evaluation crew that they sent out. If you passed their inspection, they'd give you the contract.
Q: And the contract controlled what was going to be made?
A: Yeah.
Q: And it had what the requirements were?
A: Right.
Q: So the government – I'm sorry. So in order to get these contracts National Fireworks had to be an efficient operation?
A: Yeah.
Q: You mentioned there were some other competitors in the south?
A: We bid with people from the south. Their safety was very poor and their prices were low, so we didn't always win.
Q: But you did win a substantial number?
A: Yeah.

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Q: And you did it with a good safety record?
A: Yeah.
Q: Is it fair to say that National Fireworks employees were proud of the job they were doing?
A: Yup.
Q: You specifically mentioned that your tracer ammunition was the best and so was your 60 millimeter flares.
A: Yup.
Q: So you felt you were putting out a good product?
A: Oh, sure. We'd get Army, Navy E for some of these jobs, like 20 millimeter or whatever.
Q: And was that to signify that you did a good job?
A: Yeah.
Q: Was the company, to your knowledge, ever forced to do any work for the government?
A: No.
Q: Is it more accurate to say that the company welcomed the government business?
A: We welcomed it if we got it at the right price.
Q: You weren't going to work for free?

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A: Right.
Q: You were trying to make a profit?
A: Right.
Q: And on the contracts that you did successfully bid on and complete, do you know if the company did make a profit?
A: Usually.
Q: You mentioned that in 1942 - And I apologize for jumping around a little - that the actual production of fireworks was phased out in 1942.
A: Roughly that.
Q: You said that the last two things you could remember being made were caps and sparklers.
A: Yup.
Q: Do you remember what went into making a sparkler, what the components of a sparkler were?
A: Well, it was a metal powder. I think it was iron oxide. And the quill or the gizmo that - We dipped it into a composition.
And I think it was a - I can't remember what the adhesive was, but I think it was - What do you preserve eggs in? You don't know?
Well, anyway, we used to dip these steel

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spindles into this goop. Two or three dips and it would build up a - That was the sparkler.
Q: Do you know if any chemicals or elements were added to give the sparklers colors?
A: Yeah. Strontium nitrate was added to make them red.
Q: Do you remember any others?
A: Well, red was it.
Q: Would the company buy strontium nitrate for that purpose?
A: Yes.
Q: Do you know if there was any waste strontium nitrate produced?
A: I doubt it. I think we used it all up.
Q: You were asked about your responsibilities at one point. You said you were responsible for pellet densities and graphite content and things of that nature?
A: Yeah.
Q: Were you trying to ensure that those characteristics met the government specifications?
A: Yeah.
Q: Is that because if it didn't meet the government specifications, the government wouldn't

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buy it?
A: No. It just meant that if it didn't meet it, we'd increase the density of the pellet or whatever was required to bring it up to spec.
Q: You mentioned there was a guy that mixed tracer ammo over at Fox Island.
A: Right.
Q: Do you remember if he was part of the production department?
A: He was the production department.
Q: At that one time?
A: Right.
Q: I assume the production department got bigger?
A: It may have been tracers. His name was Warren Thrasher. And he knew how to make them.
Q: He was a Fireworks employee?
A: Yup. He was an original firecracker. And he knew how to make the compositions that worked. And he chewed tobacco. He went around like this (indicating).
Q: You also mentioned that you worked in the control lab when you were a chemist. And you said that there were government employees there as well

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as Fireworks employees?
A: Correct.
Q: Do you remember how many Fireworks employees in World War II were working in the control lab?
A: Yeah. I'd say I had six or eight people that were working for me, and then the British had a guy there and the Army had a man there. And we had to furnish facilities for him.
Q: So is it fair to say that the company had more people working in the control lab than the government?
A: Yes.
Q: Do you know if that ever changed over time?
A: Well, depending on what we were making. Those government employees would get up to 30 or 40.
Q: Would the company employees similarly increase in number?
A: No, I don't think so.
Q: Did the government employees ever outnumber the company employees?
A: At that point, yes.
Q: Was that just in the control lab?

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A: Yup.
Q: And what about the inspectors? Did the government inspectors ever outnumber the company inspectors?
A: Yes.
Q: When would happen?
A: Well, it depends on what we were making and how much of an inspection was required. It's hard for me to answer that.
Q: Were you in charge of the inspection department?
A: No. I was in charge of the laboratory.
Q: And you mentioned that you were - that the company was obligated to provide laboratory space for the government?
A: Correct.
Q: Was that obligation set out in a contract?
A: Yeah.
Q: You mentioned one of the things that government employees would do at the site would be to check the moisture content of TNT, and they might say, "No. It's too wet"?
A: Yeah.
Q: Did company employees also check the

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moisture content of TNT?
A: Yes.
Q: So the responsibility was not just the government's?
A: No. You couldn't heat TNT to dry the moisture out, so you had to do it in a desiccator over anhydrous sulfuric acid. So it wasn't an easy process.
Q: In the gravel mine production program, you said that the government checked the manufacturing process. Was that government inspectors?
A: Yes.
Q: Would you say that the government was actually performing the manufacturing process?
A: No.
Q: Was that done by Fireworks employees?
A: Yup.
Q: Were there also Fireworks inspectors checking the manufacturing process?
A: Yes.
Q: You said one of the government inspector's jobs was to take samples and to test them; and if the sample failed, a lot would be rejected of detonators, for example.

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A: Okay.
Q: Did company inspectors also draw samples to test?
A: Oh, yeah.
Q: Would they also reject lots if the test failed?
A: Yeah. We usually - The company tested the lots. And if they passed, we let the government test them or use our results, if they would, or give them new tests.
Q: So the first responsibility for testing was the company's?
A: You bet.
Q: If a lot were rejected did that mean that the customer wouldn't buy it because it was not according to the contract specifications?
A: Yeah. We wouldn't even submit it to the customer.
Q: You said if a lot were rejected government inspectors would direct that the lot be destroyed. And I'm not clear exactly in what way a government inspector would direct a company employee to destroy.
A: Well, if I had a lot of detonators that

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had failed, I would say, "Hey, look, this lot failed because of these conditions, and I'm going to destroy them." And he'd say, "Okay. Go ahead."
Q: The government inspector would say that?
A: Yeah.
Q: Would that lot be turned over to somebody in the waste disposal department?
A: Yeah, right.
Q: So as soon as the decision to reject a lot were made it was the waste disposal department's responsibility?
A: Right.
Q: You mentioned that some waste was disposed of in the pond because of noise and because the water desensitized the lead azide?
A: Right.
Q: So was the pond used because of safety concerns?
A: Yeah, but mostly to cut down on the noise. And because the azide was wet, it was less sensitive.
Q: So that's the safety aspect of it?
A: Yeah.
Q: And the noise aspect, were neighbors

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complaining about the noise?
A: Right.
Q: Complaining to the company?
A: Yup. I had to buy new dishes for people.
Q: And the company didn't like getting the complaints?
A: No.
Q: So the company took steps to ensure that the noise would be decreased?
A: Right.
Q: You mentioned that one element of detonators was RDX. Was that used from World War II on or was that a material that came later?
A: That was developed in Great Britain. We began using it near the end of the war, as I recall.
Q: The World War II?
A: That's a royal demolition explosive.
Q: And we're talking about World War II?
A: Yeah.
Q: Do you know if the company ever had any special orders for fireworks as opposed to munitions?
A: Oh, sure.
Q: Did the customer putting in the special

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order for fireworks have particular specifications?
A: Sure.
Q: Did those specifications have to be met in order for the lot to be accepted?
A: Well, yeah. I don't know how stringent these specifications were, but the guys that were making these pieces, and so forth, would go set up the shell and then fire it. Our guys would fire their own shell.
Q: So when a customer wanted to buy something, the customer would tell you what it was they wanted to buy?
A: Yeah.
Q: And that would be the specifications?
A: Yeah. So many aerial flash bombs, so many of this.
Q: And they might give you more detail about what should actually be in them and how they should be built?
A: Well, not too much. We had our own product, and they would either buy it or leave it.
Q: You mentioned that you actually were responsible for building a still to reclaim the TCE?
A: That's correct.

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Q: Did anybody tell you to do that?
A: Pardon me?
Q: Did anyone tell you to do that?
A: No. I thought it was a great idea. And the tobacco and alcohol people came, and I had a mouthy guy working for me. He said, "We have a still right over here."
Q: You didn't appreciate that. Was National Fireworks buying solvent?
A: Sure. Freon for one.
Q: Let's focus first on 1942 or '43 when you built the still.
A: Yeah. We were buying trichlorethylene.
Q: So by building the still were you able to save the company money because it had to buy less?
A: Oh, sure.
Q: And you mentioned there would be some sludge eventually left over that could not be reprocessed?
A: Well, yeah, but not much.
Q: Would that sludge be turned over to the waste disposal department?
A: Yeah.
Q: And they would be responsible for –

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A: They'd flush it out. It would be a tar-like residue.
Q: And would they take that tar-like residue and burn it?
A: To the dump.
Q: To the company's dump?
A: Yeah.
Q: You talked a lot about the lead azide portion of the plant and how it was scooped out and put to dry and the various steps.
A: Yeah.
Q: Was that all done by company employees?
A: Yeah.
Q: So when you said that the girls would scoop it out, those girls were company employees?
A: Yes.
Q: Did government employees ever actually do the manufacturing process?
A: Yeah. Girls would scoop the azide, dump it into a funnel. It would go into a loading fixture, into a cup.
They would press it. Another increment, they'd press it. And then they would face it. And then they would put an aluminum disk on it and crimp

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it.
Q: But those were all National Fireworks employees?
A: Yeah, right.
Q: Government employees didn't do that work?
A: No. In fact, we had rotary machines. They sat around the machine and did their operation.
Q: The employees?
A: Yes.
Q: You also mentioned 20 millimeter tracer shells as a product. You said the company was the primary developer?
A: Yeah.
Q: Do you mean that National Fireworks actually developed this product itself?
A: Oh, sure.
Q: You also mentioned the bouchon fuses as a product.
A: Yeah.
Q: You said you bought castings and loaded the powder into them?
A: That's correct.
Q: Do you know who you bought the castings from?

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A: Various vendors. I don't know who they are now.
Q: Those were private companies?
A: Die casters.
Q: Private die casters?
A: Yeah.
Q: And you said that you were particularly familiar with the 60 millimeter illuminating shell process because you were involved in it?
A: Correct.
Q: And that you witnessed the acceptance tests?
A: Correct.
Q: Was it a - Those acceptance tests were testing the product to make sure it was up to spec?
A: Yes.
Q: Was that a standard military procurement practice?
A: Yes.
Q: Another product we talked about briefly was the squibs.
A: Yup.
Q: You said it was a pretty complex process.
A: Well, we made millions of them.

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Q: But it was complicated, relatively?
A: Well, you had to get everything set right. We had girls that put the bridge wire on, soldered it on.
And then they put a sensitive explosive on the bridge. And then they buttered a composition in the thing. And then they dried it. And then they dipped it in aluminum paint and dried it, got the resistance. And that was about it.
Q: That was all done by Fireworks employees?
A: Yes. We had a lot of squibs going out to our plants. We were supplying our own plants.
Q: You mentioned that in the lead azide area there were steam lines, and chipmunks would cut into them?
A: Yeah, right. Yeah.
Q: Was someone from National Fireworks responsible for maintaining those steam lines?
A: Yeah. We were. We had our own maintenance department.
Q: That was one of the maintenance department's jobs?
A: Yeah. They didn't realize that the chipmunks could gain access to the dry building

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through the - You know, there was tar paper and insulation.
Q: You were asked about chemical storage and whether inspectors would direct how chemicals would store.
I believe you testified that government inspectors would check how the chemicals were stored and tell you if they weren't stored properly?
A: Yeah.
Q: That's accurate?
A: Yeah. They didn't - We didn't really ask them to check. It was - If somebody thought it was a safety problem, they'd say, "Hey, go check the way National is stirring their chemicals." If it wasn't up to snuff, they'd holler. We'd usually put up a vigorous argument.
Q: Because you felt you were storing them properly?
A: (No verbal response)
Q: You need to say yes or no.
A: Yes.
Q: Would anybody from the Commonwealth of Massachusetts check on how chemicals were stored?
A: Yeah. I think so, but I don't recall

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specifically what departments did it.
Q: Do you know if the state fire marshall ever checked on chemical storage?
A: Yes.
Q: Do you know if the local fire department ever checked on chemical storage?
A: Sometimes. The state fire marshall was the prime mover.
Q: So it wasn't just the federal government?
A: No.
Q: And is it fair to say that the federal government, the state fire marshall and the local fire department were all checking on chemical storage to ensure safety?
A: Yeah.
Q: You mentioned that in the research and development area the manager would promote various developments and say that the company was producing better items.
A: Pardon me?
Q: I'm going to ask you questions about research and development.
A: Yup.
Q: Was there a manager in charge of research

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and development?
A: Yeah.
Q: You testified that that manager would try and promote various products developed by the –
A: Yeah.
Q: So would the manager of research and development try and sell the company's products to the military?
A: Sure.
Q: So the company would actually seek out that business?
A: Oh, yeah.
Q: Now, at one point you said the primary role of military inspectors was overseeing actual production. Is it true that the military inspectors were there for quality control?
A: Yeah.
Q: Were the military inspectors production foremen?
A: Never.
Q: Was it the production department that was responsible for the actual production?
A: Right.
Q: When you said that the military inspectors

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oversaw production, did you really mean that they were quality control?
A: Yeah. They oversaw the inspection of the product.
Q: And there was also company inspectors?
A: Right.
Q: Doing the same thing?
A: Absolutely.
Q: You mentioned that at one point there was a batch of bad bouchon fuses which lacked the necessary pellets and were quite dangerous. Not that you produced, but that the –
A: That's correct.
Q: And National Fireworks was not involved in producing those?
A: No, but it caused a big flurry in the industry. And the Chemical Corps put in an x-ray procedure after that happened so that all the bouchons were x-rayed 100 percent and the x-rays read.
Q: But the National Fireworks Company had never had any problems?
A: No.
Q: And is it fair to say that that's because

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your company employees were doing good work?
A: Yes.
Q: Is it fair to say that the company's own quality control employees wouldn't let such bad fuses be produced?
A: Right.
Q: And just to be clear, you mentioned Mr. Pierce and Mr. Dogett were two people responsible for disposal. And I just wanted to double-check. Those were both company employees?
A: Yes.
Q: You also mentioned that wastes weren't really buried except for maybe at the Arthur Little pit. Do you remember referring to the Arthur Little pit?
MR. DAVIS: I object. I don't think that accurately characterizes the testimony.
Q: Do you remember whether any wastes at all were buried?
A: Yeah.
Q: Do you remember where they were buried?
A: Arthur D. Little buried some waste up there in that Arthur D. Little pit.
Q: Is Arthur D. Little the name of a company

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employee?
A: Yes. No. It is the name of a company.
Q: A separate company?
A: Yeah.
Q: Did they have a pit named after them?
A: No.
Q: I thought you referred to it as the Arthur D. Little pit.
A: We did. Arthur D. Little is a very reputable company in Cambridge. They're chemists, engineers and managers. They run a tight ship.
Q: Did that company ever send waste to Fireworks for disposal?
A: Yes.
Q: Did the Fireworks company dispose of it on site?
A: Yup.
THE VIDEOGRAPHER: I'm sorry to interrupt. I need to change tapes.
MR. DERTKE: We'll take a quick break. Off the record.
THE VIDEOGRAPHER: 3:15.
(Recess taken)
THE VIDEOGRAPHER: Back on the record

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at 3:16.
Q: Do you remember approximately when the Arthur D. Little company sent waste to National Fireworks?
A: No.
Q: Do you remember if it was later in your time or earlier, close to World War II?
A: I'd say about in the middle.
Q: Maybe the 1950s?
A: We had a man that handled it. His name was Harold Gammell. The truck would come down from Cambridge, and he'd meet it and take it over to that pit and unload it.
Q: Do you know if Harold Gammell is still alive?
A: No. He's deceased.
Q: But he was a Fireworks employee?
A: Yes.
Q: Do you know what was in the waste that was sent by Arthur D. Little?
A: No. It was laboratory waste primarily.
Q: Was Mr. Gammell responsible for disposing of that waste?
A: Yes.

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Q: Do you know if any government employees were involved in the disposal of that waste?
A: I don't think so. It was a private deal.
Q: Do you know if the Little company paid Fireworks for disposal?
A: Yes.
Q: They did?
A: Yes, I believe so. How much I don't know.
Q: You were asked about whether the Fireworks company produced any liquid waste. And I want you to think about the lead azide that was – that arrived on the site.
A: Yeah.
Q: Lead azide came in bags, right?
A: Correct.
Q: And the bags were in water?
A: Correct.
Q: Do you know if the water ever became contaminated with small amounts of lead azide?
A: I imagine it did.
Q: Do you know if that water would then have to be disposed of?
A: Yeah. I think they disposed of the bags. They burned the bags.

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Q: Do you know what happened to the water?
A: No, I don't.
Q: When you say, "They disposed of the bags," would that be the waste handling department?
A: Yeah.
Q: You also mentioned that if degreasers were unusable, they'd be poured into a pit. Do you recall that?
A: No. We had some residue in the degreaser, and that would generally be taken to the dump and poured in the pit. Is that what you mean?
Q: Yeah. In addition to that, do you remember if any batches of degreaser that the company would get would ever be unusable?
A: No.
Q: You mentioned that freon if it became dirty with lead azide and had to be disposed of would be burned?
A: Yeah.
Q: But freon generally doesn't burn?
A: Right.
Q: But the lead azide does?
A: Right.
Q: Would the mixture of freon contaminated

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with lead azide burn completely and consume the freon?
A: I really don't know. I imagine so.
Q: Would the person in charge of the freon portion of the gravel mine production decide if freon was too dirty to use?
A: I imagine so, yes.
Q: And that person would decide whether the freon had to be disposed of?
A: Right.
Q: Would that be someone in the production department?
A: Yeah.
Q: So that would also be a Fireworks employee?
A: Oh, yeah.
Q: You mentioned that you didn't know of any buildings that the United States government owned at the plant.
A: No.
Q: Do you know if the government owned any land?
A: I don't believe so.
Q: You mentioned that the government was

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responsible for checking grenade fuses at one point. Was the corporation also responsible for checking grenade fuses?
A: Well, I don't know whether the corporation was, but where we were making them we x-rayed them. They either passed or failed.
Q: These were the bouchon fuses we talked about?
A: Yeah.
Q: Is it fair to say that National Fireworks was ultimately responsible to produce the munitions correctly?
MR. BELING: Objection.
A: Yes.
Q: You talked a bit about Mr. Wolfert. Would you say Mr. Wolfert is a good source of information about how the National Fireworks Company ran the plant at West Hanover?
A: Yes.
Q: Would you say that Mr. Wolfert is a good source of information about the government's role at the West Hanover site?
A: Yeah, I'd say so.
Q: At one point your responsibilities

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actually were increased so that you were the plant manager?
A: Right.
Q: As manager, were you responsible for the day-to-day activities of the plant?
A: Yup.
Q: You said that the government regulated and accounted for whatever they shipped to the plant in response to a question. And I wanted to follow up on that to see what you understood by regulated and accounted for.
If a material came into the plant did someone in the National Fireworks Company have to unpack that?
A: Oh, yeah.
Q: Do you know what department would be responsible?
A: Well, if it was an explosive item it would be sent down to Tracer Island and Pat Osborne or one of those fellows would unpack it.
Q: So government employees weren't responsible for unpacking?
A: No.
Q: Would a company employee be responsible

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for putting the material into storage?
A: No.
Q: Who would put material into storage if that were necessary?
A: Company employees.
Q: And getting material out of storage, also company employees?
A: Yeah.
Q: And who would actually use that material in the production? Was that the production department employees?
A: Yes.
Q: When you say that the government accounted for what materials they shipped to the plant, does that mean that they'd have to fill out forms?
A: I don't know. I didn't work for the receiving department, but I'm sure it was received properly.
Q: So the company also had a receiving department?
A: Yeah. Oh, yeah.
Q: And they were responsible for the paperwork to show that materials were properly received?

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A: Yes.
Q: And that was National Fireworks employees?
A: Right.
Q: Was anybody from the government responsible for ensuring that the paperwork to show that materials were received was filled out?
A: That I don't know. I presume he had the right to inspect any documents.
Q: This would be a government inspector?
A: Yeah.
Q: But it was your understanding that Fireworks employees were the ones actually responsible?
A: Absolutely. We were a private company. We didn't depend on government employees.
Q: You had your own employees?
A: Yeah.
Q: Is it fair to say that the government was the customer and National Fireworks operated the plant?
MR. BELING: Objection.
Q: You can answer.
A: I think that's basically correct.
Q: That's a fair characterization of the

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relationship?
A: Yup.
Q: Was one of Mr. Osborne's responsibilities in the safety department - Let me back up. Was Mr. Osborne in the safety department?
A: Yeah. He was in the primary explosives department, and he also had a handle in safety because he handled hazardous materials.
Q: Was he also responsible for ensuring that spills in areas under his control were kept to a minimum?
A: Yeah, the people that worked for him.
Q: Was anybody in the government responsible for that task?
A: No.
Q: Did the company have a separate department responsible for emptying sewage tanks, or was that the waste handling department?
A: Sewage tanks?
Q: Yeah. Remember we talked about the cesspools and the tanks?
A: Yeah. They had a separate department to bleed off cesspools.
Q: Do you know what that department was

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called?
A: No.
Q: You mentioned at one point that a chlorine system was put in at the West Hanover site?
A: Correct.
Q: Who in the company, if you know, decided to put the chlorine system in?
A: I think I did by prompting from the town authorities.
Q: So did anybody from the federal government or the military tell you to put in this chlorine system?
A: No. As I told you, there was a laundry downstream from us; and they were getting bad vibes from the waste, so we had to put in a chlorination operation in the Drinkwater River.
Q: Was this when you were plant manager?
A: No. It was when I was a chemist.
Q: So this was relatively early on?
A: Yeah.
Q: So even at this early stage you, as a chemist, were responsible for dealing with complaints about water pollution?
A: Yeah. We didn't have many. That's the

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only one I can think of.
Q: And you as a National Fireworks employee took steps to address it?
A: Right. Correct.
Q: You also mentioned at one point Doc Storm suggested the possibility of digging out the tetryl and recrystalizing it. Do you recall that?
A: Yeah.
Q: And did you make the decision that it wasn't economically viable to attempt that?
A: I imagine Doc Storm and I made that decision.
Q: Do you remember what years this was?
A: Pardon me?
Q: Do you remember when this happened?
A: Way early in my, you know, employment.
Q: So you and - So you as a National Fireworks employee along with Doc Storm decided that this reclamation would not be commercially feasible?
A: Yeah. We probably went to see the factory manager and said, "Hey, we don't think this is feasible. We don't want to do it." He'd consider it and say yes or no.
Q: Did National Fireworks have oil tanks for

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heating oil?
A: Yes.
Q: Do you know if National Fireworks would buy heating oil?
A: Yes.
Q: Was that a responsibility of the purchasing department?
A: Yup. Or the maintenance department. I'm not sure which.
Q: You mentioned a fellow by the name of Charlie Galottay. Is that the correct pronunciation for a government inspector who is still living here at the Cape?
A: Try that again.
Q: Charlie Galottay?
A: No, that isn't it.
Q: Galotto?
A: G-A-L-O-T-T-I, I think. I think he lives in Chatham or somewhere out on the Cape.
Q: We touched briefly on Mr. Pierce setting off these large charges and breaking the dishes.
A: Yeah, right.
Q: Was Mr. Pierce the person responsible for destroying munitions at the site?

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A: Yup.
Q: And Mr. Pierce was a company employee?
A: Right.
Q: Did somebody from the company go out and tell Mr. Pierce to be a little bit quieter about this?
A: Yes.
Q: A little quieter in destroying the munitions?
A: Yes.
Q: You were asked a question about a particular board of inquiry formed when there was an explosion of lead azide?
A: Yes.
Q: And you were specifically asked if forming a board of inquiry was company practice after an explosion. Do you recall that?
A: Yeah, but - What did I answer?
Q: Well, let me ask it - Let me just ask it to you again. If there was an accident at the site would a company employee write up a report?
A: Yes, but I only remember one board of inquiry -
Q: So there might -

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A: - that I was on. That's the one in building 85.
Q: And you were shown Exhibit 8 or 9 about that?
A: Yeah.
Q: So is it fair to say that there could have been other accidents that generated reports but did not rise to the level of a board of inquiry?
MR. BELING: Objection.
A: Possibly, yes.
Q: That board of inquiry you served on, were there any government employees on it?
A: I don't think so. There were four people. I don't think there was a government man listed.
Q: Was it the government's responsibility to investigate accidents at the Fireworks plant?
MR. BELING: Objection.
A: Yeah.
Q: And for what purpose?
A: Well, Marshall Hennault was our main inspector for the government. If we had an accident, he wrote it right up and submitted it to Decas.

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Q: That was his boss?
A: Yeah.
Q: Was the government responsible for making any changes to ensure that accidents didn't happen?
A: No.
MR. BELING: Objection.
Q: Was that the company's responsibility?
MR. BELING: Objection.
A: Right.
Q: Did the - Do you remember if Mr. Osborne ever wrote up reports on accidents?
A: No.
Q: You don't remember?
A: No.
Q: Do you remember if Mr. Osborne wrote up reports on spills?
A: Stills?
Q: Spills.
A: Oh. Well, no, I don't. He may have. I'm sure he did.
Q: If Mr. Osborne did write up such reports, would he make recommendations on how to prevent future spills?
MR. BELING: Objection.

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A: Yes, he would.
Q: Would that be part of his job?
A: Yup.
Q: And those recommendations would go to the company?
MR. BELING: Objection.
A: Yeah.
Q: Would the recommendations - Scratch that.
You mentioned that at one point you had to go talk to an admiral.
A: Yeah. Admiral Groller.
Q: Did the admiral want to know why the items he was buying weren't ready according to the contract terms?
A: Right.
Q: When you were a chemist was one of your responsibilities to analyze the magnesium powder being produced?
A: Yes.
Q: And could you reject batches?
A: Absolutely.
Q: Did you have any voice in the administering of the magnesium production?

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A: No, but I was in charge of inspecting it.
Q: So there is a distinction between you inspecting it and the actual production?
A: Right.
Q: And your responsibility as an inspector was to ensure that it met the specifications?
A: Right.
Q: Did the company produce a toy called Poochie Dogs?
A: Yes.
Q: Were those painted?
A: Yes.
Q: Do you remember what kind of paint was used?
A: Yeah. It was a rubber cement paint with pigment in it.
Q: Do you remember what kind of pigments?
A: Well, no. Standard pigments, whatever. I bought that paint from some outfit down in Connecticut. I bought tons of it.
Q: Do you remember if the paint or pigment had any lead base?
A: I don't think so, but I don't remember.
Those toys were made out of neoprene which was

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2-chlorobutadiene.
You can still find pieces of that down there in that dump area. We made a million of those.
Q: Was the company's waste disposal department responsible for disposing of waste toys?
A: Well, those were the only waste toys we had. Yes.
Q: So the company worked the same way whether it was working on munitions or private products?
A: Right.
Q: At any time during your tenure at National Fireworks did waste ever come in for disposal from MIT?
A: Yes.
Q: Do you know what that waste was?
A: I don't, but I would tell you there would be general laboratory waste.
Q: Do you remember when that waste first started coming to National Fireworks?
A: No.
MR. DERTKE: Okay. Let's take a quick break so I can look at my notes. I think I'm almost done.

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THE VIDEOGRAPHER: Off the record at 3:38.
(Recess taken)
THE VIDEOGRAPHER: We're back on the record at 3:47.
Q: Mr. Kent, do you recall if any of the buildings at the West Hanover plant were painted?
A: Yes.
Q: Did the company have a department responsible for painting?
A: Yes. We had a sign painter, but we also had some of the buildings spray painted. And we contracted that out.
Q: To a private company?
A: Yeah.
Q: Do you remember what kind of paint they used?
A: No.
Q: Would they be responsible for cleaning up after themselves?
A: Yes.
Q: Two questions on detonators. Were detonators produced by National Fireworks at West Hanover primarily tested on site or were they taken

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off site for testing?
A: On site. By that I mean in the plant.
Q: Right. Were fuses primarily tested on site or off site?
A: 99 percent on site. Once in a while they'd go to the customer.
Q: What about the 20 millimeter shells?
A: Those were proofed down in Halifax. We had a range down there, which is 20 miles away. And we had a bunch of garages with open doors and a gun in each bay.
And we'd test our 20 millimeter down there. We took land by eminent domain. We had two to 3,000 acres, so we had a pretty good range.
Q: What about the 60 millimeter illuminating rounds, were those tested off site?
A: Yeah. Those were tested at Aberdeen Proving Ground.
Q: The gravel mines, were those tested off site or on site?
A: On site.
Q: And primers?
A: On site.
Q: The squibs that you made, were those

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tested on site?
A: Yup.
Q: And I might have asked you about incendiary grenades, but were those tested on site?
A: Yes.
Q: I think you mentioned one element of a detonator was a copper cup?
A: Right.
Q: Were any of those copper cups ever flawed or unusable?
A: They were made on an eyelet machine. We had a guy down in Rhode Island that made eyelets, and he made these cups.
Q: So those cups - I'm sorry.
A: For detonators.
Q: Those copper cups were not made at West Hanover?
A: No.
They were also made of aluminum and in some cases stainless steel.
Q: If a batch or lot of any particular product were deemed to be off spec, could it be reworked so that it were reusable?
A: Well, occasionally. Like, if a lot of

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detonators weren't dimensionally perfect we could squeeze them into shape. Most of our stuff was all right as it came off the line.
Q: Would you say a small percentage of the production was off spec?
A: Very small.
Q: A question about the process of bids being solicited for work.
A: Yeah.
Q: Were there some bids for government work that you did not participate in?
A: Oh, sure. We read the Commerce Daily every day and looked for the bids in there.
Q: If there were particular bids that had something in the specifications that National Fireworks either didn't like or didn't agree with, was National Fireworks free to stay out of the bidding?
A: Oh, sure.
Q: So you chose which projects to bid on?
A: Yeah.
MR. DERTKE: Thank you, sir. That's all the questions I have.
MR. DAVIS: But I have a few more.

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THE WITNESS: I knew you would.
MR. DAVIS: Sorry.

REDIRECT EXAMINATION
BY MR. DAVIS:

Q: You mentioned the use of sulfuric acid to desiccate wet TNT?
A: Right. You aren't familiar with that, huh?
Q: I'm familiar with sulfuric acid.
A: Are you familiar with a pyrex desiccator?
Q: Could you describe it.
A: It is a glass container with a ground glass rim. And the top goes on there with a little grease. And it has a spout on it for - to put a vacuum pump on. You'd put a vacuum pump on.
First you'd put sulfuric acid in the bottom, and then you'd put the samples in there obviously above the sulfuric acid, and then you desiccate it and leave it overnight.
In the morning you let the air back in through a sulfuric acid tower so it dehydrates, and then you weigh the samples and determine the loss of weight.
Q: What was done with the sulfuric acid after

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it was finished being used for this process?
A: God only knows. It was a laboratory amount. It was good for quite a while. You know, we'd use it for half a year.
Q: So there weren't large quantities?
A: No. There was a very small amount.
Q: To your knowledge, did the National Fireworks facility ever obtain any raw materials from the Picatinny Arsenal or any other government installation?
A: Yeah.
Q: Could you describe what that was.
A: Well, they were involved in research and development work. And they would send up warheads or explosive charges for us to test. And they'd send a man up, and he'd witness the test. But it wasn't a big production thing.
Q: Did any military installation ever send raw materials that were used in making products at National Fireworks?
A: I can't think of any.
Q: Did the government ever assist or get involved in helping National Fireworks, say, during World War II to obtain explosives?

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A: Not to my knowledge.
Q: Were there ever any shortages of any of the raw materials that you were using in World War II?
A: There was a shortage of titanium dioxide. I was using that in my toy business. And they used their license to get titanium, and I found out about it. I was madder than hell.
Q: "They" who?
A: The purchasing department at the National Fireworks. Without telling me they went and got - bought with their license titanium dioxide.
Q: What license are you talking about?
A: Well, it's a priority. You know, you got to - You're a war industry, so you can buy so much titanium dioxide.
We better forget this whole thing. It is irrelevant.
Q: Okay. Did National Fireworks use its license as a military contractor to obtain other raw materials?
A: Not to my knowledge.
Q: So if they were obtaining RDX or lead azide, that was not obtained using a license?

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A: I think they had to give their contract number.
Q: To who?
A: To the arsenal or wherever they were buying it.
Q: Okay.
A: In other words, if you wanted to buy lead azide you had to show what contract you were using it on, et cetera.
Q: Could just any company that was operating in World War II buy lead azide?
A: No. They had to be licensed to use explosives.
Q: By whom?
A: By the ordinance department, I would say.
Q: Would that apply to all the explosives that National Fireworks acquired?
A: Well, I think so. That's a pretty broad statement, but I would say yes. We had to buy them legitimately.
Q: And that was regulated by the ordinance department?
A: Yeah.
Q: How did National Fireworks come to have 10

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plants at the end of World War II?
A: They had more than that.
Q: How many?
A: Probably 12 or 14.
Q: Were all the other plants developed during World War II?
A: Sure. Soon as we got those 20 millimeter made down in building 307 we began to make them for other plants.
And then we'd set up the plants to make their own, and we'd put our guys out there on the plant to show them how to do it.
Q: Were all these 10 or 12 plants - Was the reason for their existence to make 20 millimeter shells for the military?
A: For the Navy.
Q: And what happened to all of those 10 or 12 plants besides the West Hanover facility after World War II?
A: Well, they went out of business and the buildings were sold. In some cases the buildings belonged to the Navy because the Navy built them.
Q: Was National Fireworks in West Hanover the only one of its facilities that continued in

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operation after World War II?
A: Yeah.
Q: What happened to employment at the West Hanover facility after World War II?
A: It got pretty sparse.
Q: Did that change when the Korean conflict came around?
A: Yeah. We went in – We made that rubber toy that I mentioned, the Poochie Dog. We had two plants going, one in New Bedford and one in Hanover.
Q: What did that have to do with the Korean War?
A: Nothing. We did it just to tie them.
Q: Just a coincidence?
A: Yeah.
Q: How about the Vietnam War, did that have any effect on levels of employment at the facility?
A: Some.
Q: Did it go up?
A: Down.
Q: Employment went down during the Vietnam War?
A: Yeah.
Q: Why?

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A: Well, maybe I'm wrong there, but I don't think we had as much to make in the way of munitions. We had some of these small items.
Q: Were the Poochie Dogs an economic success for the company?
A: Yes.
Q: For how long?
A: Quite a while. I got one percent of the net sales, royalty.
Q: You got one percent?
A: Yeah.
Q: You got rich?
A: No. I got screwed.
Q: I'll leave that one alone.
A: Okay.
Q: Besides Arthur D. Little and MIT, did wastes come onto the National Fireworks property in West Hanover over from any other source for disposal?
A: I would say these were the principal ones.
Q: Do you know of any others?
A: Not offhand. American Fireworks destroyed their own. That's it.
Q: Following up on something Mr. Dertke asked

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you, when there was an accident or explosion how did the government get involved?
A: They were notified immediately.
Q: By whom?
A: By the management. Usually the plant whistle went. That meant we had an accident. They'd go to the spot where the accident occurred to evaluate it.
Q: "They" being who?
A: Marshall Hennault, the government inspector.
Q: Would this continue after World War II with other government inspectors?
A: Yeah, they kept doing it.
Q: What did they do after they inspected and evaluated the site?
A: Wrote a report. You know, that's about it. Wrote a report and took corrective action if they could, the company did.
Q: Did the military agencies get involved in what corrective action was taken?
A: I don't think so. No, I don't think so.
Q: Do you know what was done with these reports that the military people wrote?

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A: I don't.
Q: At all times that you were employed at National Fireworks West Hanover was military – the production of munitions for the U.S. military the primary reason for the facility's existence?
MR. DERTKE: Objection.
A: Yeah, more or less.
Q: Could the company have survived without the military contracts to produce munitions?
MR. DERTKE: Objection.
A: I doubt it.
Q: Why was the plant shut down in the early 1970s?
A: No business. We had to sell off trucks to be able to meet the payroll. We had to do a lot of drastic things to survive.
Q: Did that coinside in any way with the winding down of the Vietnam War?
A: Well, I can't answer that because I don't clearly see these events in their proper sequence. I'm not knowledgeable on it. I'm not avoiding you, but I just don't know.
Q: That's a fair answer. Just one other question. Exhibit 4, which is this newer map, shows

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a range at the southern end of the facility.
A: Yeah. I'm quite familiar with it.
Q: What was done at the range?
A: The first 20 millimeter gun that was smuggled out of Switzerland was brought over here and set up on that range. And that's where we began to test our 20 millimeter that we made up here in 507.
Q: Now, for what period, to your knowledge, was the range used?
A: Well, it was always used.
Q: For shooting 20 millimeter ammunition?
A: Well, 20 and other items. I'm trying to think. A whole bunch of detonators, primers. The works.
Q: They were tested on the range?
A: Yeah.
Q: Were military inspectors, to your knowledge, present when these tests were conducted?
A: Yeah. Like, if we had a lot of primers, they'd draw a sample and fire them on the spot or in a steel cabinet.
Q: At the range?
A: No. Up in the buildings.

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Q: I'm talking about what happened at the range.
A: At the range, 20 millimeters. We did cook-off tests. We fired 250 rounds continuously and then would throw around the reach and let it sit there and see if it went off from the heat.
Q: And those were shot into that bank down there?
A: The bank, yeah. They call that a cook-off test.
Q: And were those tests overseen by military inspectors?
A: Yeah, I would say so. Yeah.
MR. DAVIS: I have no further questions.
MR. ARATEN: I have just two or three.

CROSS EXAMINATION
BY MR. ARATEN:

Q: Good afternoon. My name is Jeff Araten. I represent MIT.
A: Oh. Hi, Jeff.
Q: How are you?
A: Good so far.

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Q: Showing you Exhibit 3, earlier you identified a waste disposal area?
A: Yeah.
Q: The boundary of that?
A: Yup.
Q: Can you tell me, you also said some waste from MIT was disposed of at the facility?
A: Yeah, right.
Q: Was that waste disposed of within the boundaries of what you've identified or –
A: I don't know. I got to look here. I think – I'd say – It's not in this area here (indicating), I don't think. I can't really be sure.
Q: Let me, maybe, show you another map. I'm looking at Exhibit 4. Looking at this map, Exhibit 4, I point your attention to the south corner of the site labeled on this map "Demolition Area Pit, Waste Pit."
Do you know whether the waste from MIT was disposed of in that general area, if you know?
A: I don't think so. I think that was up in this area here (indicating). There is the demolition pit there (indicating). I'd say it's up

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in here (indicating).
Q: Okay.
MR. ARATEN: I have nothing further.
MR. BELING: I have just a couple questions for you.

CROSS EXAMINATION
BY MR. BELING:

Q: My name is John Beling. I represent National Coating Corporation. I just want to ask you a couple quick questions.
A: Okay.
Q: This isn't the first time you've testified regarding the West Hanover facility, is it?
A: No.
Q: You had your deposition taken once?
A: Right.
Q: And you supplied an affidavit a number of years back. Do you recall that?
A: Well, no.
Q: Let me just show you something. It's an affidavit. It's dated October 10th, 1989. If you could do me a favor and skip ahead to the last page and take a look at the signature on it. Is that your signature?

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A: Yeah.
Q: Let me ask you a very general question, sir. We're talking about things that happened up to 56 years ago, right?
A: Yup.
Q: Is it safe to say that your memory starts to fade after a while?
A: It sure does with me.
Q: Is it safe to say your memory may have been a little bit better in 1989 when you swore off this affidavit?
A: Maybe.
Q: I just want to direct your attention to paragraph number 12. It's on page 5 here. Take your time. It starts, "Branches of the United States."
MS. GRECO: Has that been marked as an exhibit?
MR. BELING: No, I'm not going to mark it. Do we need to? We can mark it if you'd like.
MR. DAVIS: Why don't we mark it as 11.
MR. BELING: We'll mark it as 11.

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(Exhibit Number 11 marked for identification)
Q: Let me know when you're done reading that paragraph.
A: Sure.
(Pause)
Q: Have you had a chance to finish reading paragraph 12?
A: Yeah.
Q: If you could go back to page 5 for a second. I just want to direct your attention to the second sentence in paragraph 12. I'll read it.
It says, "The federal government supplied many of the explosives and other materials such as tetryl, smokeless powder and black powder that was sent to the site for incorporation into various munitions." Do you see where I've read from?
A: Yes.
Q: Do you agree with that statement today?
A: No.
Q: You do not?
A: No.
Q: So your recollection today is that the government did not supply those materials?

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A: I know they didn't.
Q: Do you recall why you – Do you recall who you supplied this affidavit to?
A: Gee, I don't.
MR. BELING: That's all I have, sir.
MR. DERTKE: Mr. Kent, a couple more questions. Very few.

RECROSS EXAMINATION
BY MR. DERTKE:

Q: Would you have known if the government sent raw materials to National Fireworks to use in production?
A: Not necessarily.
Q: Who would know that?
A: The shipping department, purchasing department, inspection department.
Q: As plant manager were you responsible for overseeing those departments?
A: Yeah.
Q: Was the purchasing department trying to use your license to get titanium dioxide for use in toy production?
A: No. They were trying to get it to resell it, and I needed it for toys.

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Q: So your license was for use in toys, and they wanted to –
A: That's correct.
Q: – sell it to private companies?
A: I don't know what they were. They wouldn't talk to me about it.
Q: So even when the company was making toys for sale, the company needed what you term a license to get titanium dioxide?
A: I don't know whether "license" is the proper word, but they needed some sort of priority. That's the word.
Q: You said there were over 12 different facilities operating during World War II?
A: Right.
Q: Was World War II production profitable for National Fireworks?
A: I would say so. They had to return $9 million in excess profits.
Q: Under the law?
A: Yeah.
Q: You talked about tests at National Fireworks's range. Was there a department at National Fireworks responsible for running the

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160/2085 NATIONAL FIREWORKS CO. INC. (WEEKLY PROGRESS REPORT)

June 13/43—1st P.D. fwding ltr frm Natl Fireworks, Inc. Sub, Weekly Progress Report—June 12/43 Natl Firewks
1st Ind. June 16/43 Inc.—West Hanover, Mass. Prod Abstract (as Listed on June 8, 1st Lt. W.O. Adams, Mr. C.F. Veal & ten woman supervisors inspectors arrived frm Atlanta P.D. for 4 days training in inspec of substitute bombs, as well as magnesium bomb and in administrative duties. The purpose of the ch was to train this personnel to set up similar system of inspec. at Cordova, Tenn. plant of Natl Firewks Cross Ref:—
W1302-cws-317-Natl Firewks, Inc. 160/2 (Insend)
W1302-cws-332 " " " 160/2085

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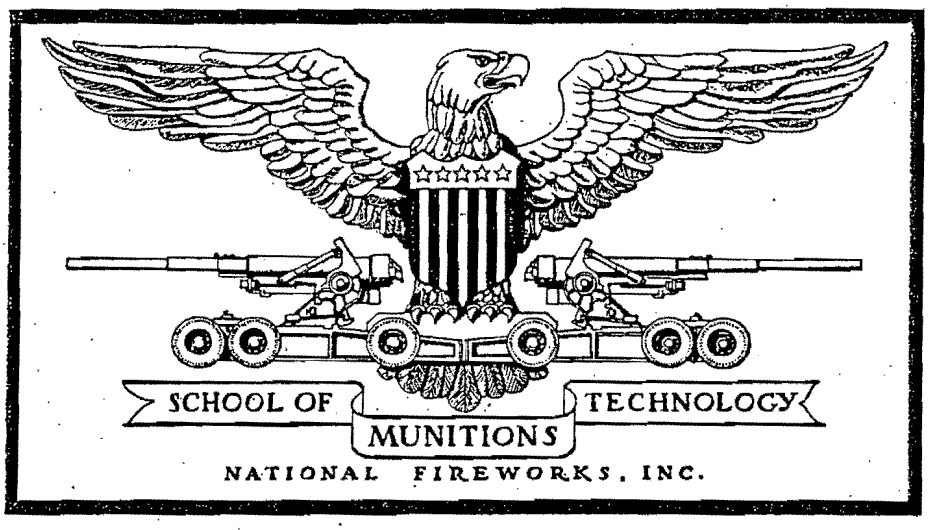

MANPOWER IN MUNITIONS

A FOREMAN'S MANUAL

10902528

should reap rich rewards in loyalty and friendship, not only to ourselves but to the Company we represent.

It must give a foreman a great sense of satisfaction to hear what I heard while driving a workman up to Rockland recently. The man was unknown to me, but his foreman wasn't, and during the course of our conversation, he told me he believed that his Foreman was the squarest man he ever worked for, and even went so far as to say, "If he fired me, I'd know that I deserved it". I believe that feelings such as this promote Teamwork more than all the lectures that could be given, and we should realize that it is within our power for each of us to have that same respect and cooperation, and in turn have the respect and cooperation of our superior officers.

J. W. V.

Government Procurement Step by Step

All requirements of the Army and Navy Bureaus of Ordnance must be approved by Congress, with funds appropriated.

Negotiations with Contractors

There are two kinds - sealed, competitive type and negotiated (price breakdown). Most contracts today are what is termed "Classified", meaning they are Restricted, Confidential or Secret, so far as outsiders are concerned, in gaining knowledge of our operations. If our Company reputation for handling the work, as to quality, facilities and price (which is developed by our Estimating Department after study), is satisfactory to the Government, then an award is made, which is set up as a new project in our records.

Setting up to Produce

Required buildings, tools and equipment are carefully studied by our Engineering Department, with others placed for these tools, jigs, fixtures and equipment with responsible suppliers, to be in our hands and installed within a period of time to meet the delivery schedule called for in the contract.

Component Parts and Materials

Here again our Engineering Department is called upon to turn out what we term the Project Sheet. This shows the total amount of parts and materials required to produce the contract. Of special interest is the fact that the Government supplies the component parts and materials for approximately 85% of our contracts, meaning that National Fireworks, Inc. furnishes only the approximate 15% remainder. Your logical inquiry is "From whom does the Government purchase our supplies?" The answer is, "From companies in New England and other parts of the U. S., who before

the war were engaged in the business of supplying similar parts and materials as are now required or have since converted their plants for war work. As you are aware, many of our largest war material producers are the companies which in peacetime manufactured automobiles, trucks, refrigerators, radios and the like. Fortunately, these companies are staffed with management and engineering personnel, mechanics and supervisors to make rapid conversion of their plants possible to meet the war requirements.

You may then query, "Why are we at times faced with a shortage of certain parts of materials, which causes us to retard production, and in some instances, to close a line?" That is the time when you foremen are called upon to make tactful explanation to the men and women working for you on the production line.

Here at National Fireworks we maintain a Production Planning and Purchasing Department, whose duty it is to keep us stocked with parts and materials. Likewise, the Boston War, Navy and Chemical Warfare Offices, and these same branches in Washington as well maintain Production Control Units, and it is with these divisions our company works and plans on parts and materials.

For each round of ammunition completed and posted to the credit of contracts at National Fireworks, the same posting and progress goes to our credit in the Government Branch holding the particular contract. Even with our combined planning efforts, as explained, due to the assorted lot of required parts and materials, we are obviously faced daily with an exhausted or low stock of certain items. Considering this situation closely, there is apt to be more criticism applied to National Fireworks than to the non-delivery supplier, since we do the final work on the ammunition, i.e., the loading, assembly, packing and shipping.

Other Factors Affecting Delivery of Parts and Materials

1. All parts and materials must closely adhere to rigid specifications of quality, as laid down by the Government on each item. It is one of the main duties of the Government Inspectors to see that the material used and produced by us comes up to specification standards. In these days of certain scarce materials, such as magnesium, aluminum, tin, copper, rubber, etc., some parts are held up until an available and satisfactory substitute is developed.

2. Each contract is given a priority standing by the War Production Board, and delivery of all items related to the contract is governed by the priority rating assigned. This rating is set according to the need for this article.

3. National Fireworks, Inc. was one of the first in private industry to convert their plant to Shell and Bomb Loading and assembly work. This was in the Fall of 1940. With all-out production under way for 1942, such tempo and large requirements naturally place a drain on the materials and equipment of all manufacturers as never before. It is

400.12/373 (6/20/42) NATIONAL FIREWORKS (P.O. 3012-42, AMEND #1)

July 16/42-1st P.D.Amend.#1.PO 3012-42 Type II. Amend order as to shipping instructions only:
(a) 8,000,000 ea.Container Assembly.
(b) 8,000,000 ea.cover
(For M-14 Incend.Grenade Code 20 Priority A.L.C. ship to: Natl.Fireworks,West Hanover Mass. PO 10005-43 as req'd. NatllFireworks, Cordova,Tenn. PO 10005-43 as req'd. P.B.A. MO 4001-43 as req'd. in 10 equal monthly increments.

400.171/775 Incend. NATIONAL FIREWORKS (CLUSTERING METHOD)

July 13/42-Atlanta P. D. TT (W-721-3-2).
"NAT'L FIREWORKS HAVE REQUESTED THAT THEY BE ALLOWED TO USE SAME CLUSTERING METHOD AT CORDOVA AS THEY USED AT WEST HANOVER. THIS IS APPROVED AS LONG AS SATISFACTORY CLUSTERS RESULT. NEW SPECIFICATION FOR THERMATE & 1ST FIRE MIX, THAT IS SPEC. 196-131-92, WILL BE USED.. THIS REQUIRES THE BODY TO BE WELL VENTED."

10902529

400.12/373 (6/20/42) NATIONAL FIREWORKS (P.O. 3012-42, AMEND #1)

July 16/42-1st P.D.Amend.#1.PO 3012-42 Type II. Amend order as to shipping instructions only:
(a) 8,000,000ea.Container Assembly.
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REPRODUCED AT THE NATIONAL ARCHIVES

400.171/775 NATIONAL FIREWORKS INC.(CASTOR OIL IN FIRST-FIRE MIX)

Aug 8/42 Nat'l Office Fireworks, Inc. Cordova, Tenn. thru
1st Ind. Atlanta P.D. Subj: Castor Oil in first-fire
Aug 13/42 mix. In our ltr of July 25, we explained reason why the use of cator oil in first-fire composition produces higher percentage of functioning bombs as compared to lubricating oil in its stead. Also req. permission to use castor oil. in regular prod. on incend. bombs at our Cordova Plant. To date rec'd neither permission nor any indication fr you as to whether or not our request is being considered.

400.171/553 NATIONAL FIREWORKS, (P.O. 1397-42)

AUG.4/42-2ND P.D. XXXX TT W.198-2-2 RE PO 1397-42. PLACE ORDER TO COVER PO, MAKE SHIP NOTES TO NATIONAL FIREWORKS AT MAY'S LANDING AND CORDOVA.

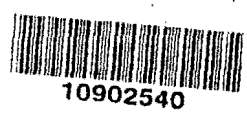
10902530

160/2085 NATIONAL FIREWORKS, INC. (PREFERENCE RATING APPLICATION)

Apr.23/42- 1st P. D. Subject Preference Rating Applications, National Fireworks, Inc. This Co. require additional capital equipment at West Hanover, Mass., Cordova, Tenn., and Mays Landing, New Jersey in order to complete contract W1302-CWS-332 which covers the assembly of 35,000,000 incendiary bombs valued at $15,750.00, completion on April, 1943. We enclose for your review, countersignature and disposition certificates M-119943, M-119950, M595253, M-695254; M595256; M-193848; M-595257; M 595259 and M-119947

160/2085 NATIONAL FIREWORKS INC (SUPPLIES FOR PALNTS)

Apr.24/42-1st P.D.fwd.ltr.fromlst P.D.Subj. Supplies for
1st Ind. National Fireworks,Inc.Plants at Cordova,Tenn.
May 1/42 and Mays Landing,N.J.Based on excepted construction schedules,National Fireworks have given me a memo.of the components and other materials they will require for their bomb loading schedule. Attaching a copy of this memo.for the Cordova plant.Informed that the Mays Landing plant will require 50% of this material.IN bothe cases the initial date should be advanced to May 15.



10902540

REPRODUCED AT THE NATIONAL ARCHIVES

160/2085 THE NATIONAL FIREWORKS, INC. (PREFERENCE RATING CERTIFICATES M-119943, M-119950, M-5595253, M-595454 M-595256, M-193846, M-595257, M-595259, M-119947)

Apr. 26/42--Priorities Divis., Army-Navy Munitions Board. Subj: Preference Rating Certificates. The National Fireworks, Inc. requires additional capital equipmt. at West Hanover, Mass., Cordova, Tenn., Mays Landing, N.J. in order to complete Contract W-1302-CWS-352 which covers the assembly of 35,000,000 incend. bombs valued at $15,750. Inclosed for assignmt. of rating and disposition find certificates M-119943, M-119950, M-595253, M-595454, M595256, M-193846, M-595257, M-595259, M-119947. Required delivery date for the various items of capital equipmt. is May 15/42, it is requested this be given immediate consideration. Incl. 53, (9PD-3A Forms in Quint. 8PC-20 Forms)

160/2085 NATIONAL FIREWORKS, INC. (CONSTRUCTION OF BOMB LOADING PLANT, MEMPHIS, TENN.)

May16/42- 1st P.D. SUBJ: Construction of Bomb Loading Plant Memphis Tenn. Inclosed is cy of ltr dated 12/20/41, concerning schedule for Nat'l Fireworks, Inc. Due to increased production at W.Hanover, the schedule is obsolete, but recommendation that info be given to dists was not acted upon, and plants fairly well along. Attached is cy of ltr fr Memphis Light, Gas & Water Div, stating the WP B has turned down request for auth to furnish power for Nat' l FireworksPlant at Memphis. Recommend OWS investigate this.

REPRODUCED AT THE NATIONAL ARCHIVES

400.171/550 Incend. NATIONAL FIREWORKS CO.(RE:M54 METAL COMPONENTS SHEDULED TO)

May 18/42-1ST P.D. TT W-452-342 RE M54 METAL COMPONENTS SCHEDULED TO NATIONAL FIREWORKS.DIVERT 900,000 SCHEDULED TO WEST HANOVER PLANT TO CORDOVA TENNESSEE PLANT & 2000,000 TO MAYS LANDING, NJ PLANT FROM AVAILABLE STOCKS.NOTIFY THIS OFFICE AMOUNTS & FROM WHAT PO'S THEY ARE DIVERTED. DIRECT REPLY TO LT. ALSTON.

400.171/552 Incend. (5-18-42) NATIONAL FIREWORKS CO.(M54 BOMB COMPONENTS)

May 18/42-2nd P.D. Subj: M54 Bomb Components for Cordova and May's Landing, National Fireworks plants in Cordova, Tenn and May's Landing, N.J. are now ready to load. N.Y.District is shipping components to National Fireworks at West Hanover, Mass. From the amounts scheduled to Nat.Firework at West Hanover, divert the components in amounts indicated below to the new plants. Notify this office at once of the action taken on each componen t and the Proc.Orders affected.
The list is as follows:

10902541

471.6/1069 NATIONAL FIREWORKS, INC. (SAFETY REPORT)

June 22/42-Atlanta P.D.Subj & ltr.fr.National Fireworks Inc.Cordova,Tenn.Subj:Safety Report.Reference in this letter are to designate par.and subpara.in mimeographed booklet:Safety Directive 1 for Loading and Handling of Thermate and Magnesium Bombs,MB,Office of the CWS,Wash.DC.May 25/42.
1st Ind. June 26/42

470.1/400 NATIONAL FIRE WORKS PLANT (ALUMINUM ALLOCATIONS FOR SEPTEMBER, TELETYPE NO. W-946-3-2)

June 20/42-Atlanta P.D.Subj:Aluminum Allocations for Sept.TT No.W-946-3-2. It is advised that there are no requirements for aluminum on present orders held by this District.National Fireworks Plant,Cordova,Tenn.,is being supplied requirements fr.other Districts Through Boston contract.

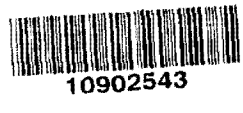
10902542

160/2085 NATIONAL FIREWORKDS INC(DAILY PRODUCTION AND INSPECTION REPORTS)

Aug110/42-National Fireworks, Inc., Cordova, Tenn. Subj: Daily Production & Inspection Reports. Attached are Daily Production and Inspection reports Nos.6,7,8,9,10 and 11. Serial numbers have been corrected and these are to replace the reports bearing incorrect numbers previously forwarded.

160/2085 NATIONAL FIREWORKS INC (DAILY PRODUCTION AND INSPECTIONS REPORTS)

Aug.8/42-National Fireworks, Inc., Cordova, Tenn. Subj: Daily Production and Inspection Reports. Attached are Daily Pro. and Inspection Reports Nos.5,6,7,8,9, and 10. Through error these were not attached to P-1A for July 31st.



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