From: Rand Crafts
To: HP_DensePak
Date: Monday, February 05, 2001 2:22:07 PM
Subject: IPP Dense Pack Project - Construction Scenarios

PROJECT SCENARIOS: Various modification and operating issues.

I think that we (Parsons, DWP, and IPSC Environmental staff) can agree that for this small project, we should be able to avoid the expense of PSD NSR and BACT. However, under each of the given scenarios given, we would like to describe for Staff the permitting issues that lie with each, and the circumstances under which NSR and BACT could apply.

Project approval is expected at the next IPSC Coordinating Board & Steering Committee meeting in March. The Board and members would like to have all the scenarios and permitting issues spelled out for them so they can make an informed decision. That decision may include whether or not to proceed with the project; to what extent each portion of the project should be constructed, and if funding for any pollution control equipment should be approved. Those decisions will be based upon our (Parsons, DWP, and IPSC Environmental staff) recommendations and the economic analyses being done by the engineering group.

Scenario One: Replace only the high pressure section of each turbine with an improved blade design, called the HP Dense Pack upgrade. This alone will improve performance 3-7% and provide a corresponding decrease in fuel usage and emissions. Capacity can not be increased practically by this project alone due to bottle-necking at other points. Project cost for both units is $12M.

Scenario Two: The complete HP Dense Pack Project will include the HP Dense Pack upgrade installation, and all the corresponding modifications to improve reliability and to de-bottleneck flow problems, increasing performance further. This action will increase real capacity of the units by 50MW each, although operation will be limited to present load parameters of 875MW, resulting in less fuel usage and emissions. Project cost would double.

Scenario Three: Perform the full project installation and modifications as described in Scenario 2, and maintain current fuel usage, matching previous emissions. The result will be an increase in generation output from 875MW to approximately 895MW each.

Scenario Four: Same as scenarios 2 & 3 as far as full project installation and modifications, but fully utilize new capacity, resulting in a corresponding increase in fuel use and net significant emissions. Same costs (excepting potential pollution control equipment).

We need to review these options with an eye towards applicability under PSD NSR, along with other potential implications and permitting issues. I provided a recommendation to IPSC management to submit an NOI for the full project design (Scenario 4), calculate potential emissions impact, and strive for synthetic minor permitting. We would like to address the benefits (i.e., possibly no new pollution controls) and pitfalls (i.e., new lower limits) of this. Then we can compare pros & cons against adding pollution control for NOx. Also, I noted to Staff that under Scenarios 2 & 3, we would be required to have some enforceable limit in place to prevent use of increased capacity to forestall the full implications of NSR. Please correct me if I'm wrong.

We can discuss further on Thursday. Please call me if you have any questions.

Rand Crafts
Intermountain Power Service Corp

INTERMOUNTAIN POWER HP TURBINE DENSE PACK PROJECT
NOI / PSD Calculations

Operating & Production

Parameter	Average Value	UoM	Post-Change Value
Rated Output	875	Mwhe	925
Fuel Use (Coal)	5,264,292	tons/yr	5,578,473
Plant Operating Time	16,386	Unit hours	16,386
Heat Value	11,872	BTU/lb	11,872
Heat Input (Actual)	7,829	MMBtu/hr	8,083
Heat Input (Design)	8,352	MMBtu/hr	9,225
Heat Rate	9,564	Btu/KWhr	9,475

Emissions

Parameter/Pollutant	2 Yr Average Value	UoM	Post-Change Value	PSD Major	Trigger Value	Change+/-	PSD?
PSD							
SO2	3586.31	Tons	3513.10	40	3626.31	-113.21	N
SO2 % Removal	93.62	%	93.88				
NOx	25143.97	Tons	24346.10	40	25183.97	-837.87	N
CO	1317.06	Tons	1394.60	100	1417.06	-22.46	N
PM10	273.77	Tons	283.51	15	288.77	-5.25	N
Lead	173.51	pounds	245.50	1200	1373.51	-1128.01	N
VOC	25299.45	pounds	26808.92	80000	105299.45	-78490.53	N
Beryllium	2.03	pounds	2.76	0.8	2.83	-0.08	N
Mercury	162.23	pounds	210.68	200	362.23	-151.25	N
Fluorides (HF)	19393.97	pounds	20313.00	6000	25393.97	-5080.97	N
Sulfuric Acid	8124.47	pounds	8108.13	14000	22124.47	-14016.33	N
HAPs & Others				**ETV**			**Review?**
Metals							
Antimony	35.24	pounds	39.70	0.184	Any Increase	-0.184	
Arsenic	265.59	pounds	285.75	0.001	Any Increase	3.35E-07	Y
Barium	648.86	pounds	814.20				
Beryllium	2.03	pounds	2.23	0.00	Any Increase	-2.34E-04	
Cadmium	68.27	pounds	82.82	0.001	Any Increase	-3.42E-04	
Chromium	529.16	pounds	572.05	0.006	Any Increase	-0.004	
Cobalt	54.84	pounds	62.97	0.007	Any Increase	-0.007	
Copper	42.80	pounds	56.20				
Lead	173.36	pounds	210.39	0.018	Any Increase	-0.016	
Manganese	292.76	pounds	347.20	0.037	Any Increase	-0.033	
Mercury	162.22	pounds	210.98	0.009	Any Increase	-0.008	
Nickel	296.86	pounds	302.84	0.037	Any Increase	-0.006	
Selenium	3214.67	pounds	3213.20	0.074	Any Increase	-0.074	
Vanadium	771.68	pounds	40.35				
Zinc	47.22	pounds	53.32				
Organics							
Acenaphthene	2.68	pounds	2.85				
Acenaphthylene	1.32	pounds	1.39				
Acetaldehyde	3000.85	pounds	3179.73	13.863	Any Increase	-13.952	
Acetophenone	78.96	pounds	83.68	18.084	Any Increase	-18.084	
Acrolein	1526.64	pounds	1617.76	0.071	Any Increase	-0.068	
Anthracene	1.11	pounds	1.17				
Benzene	475.18	pounds	503.33	0.588	Any Increase	-0.586	
Benzo(a)anthracene	0.42	pounds	0.45				
Benzo(a)pyrene	0.23	pounds	0.24				
Benzo(b,j,k)Fluoranthene	0.58	pounds	0.61				
Benzo(g,h,i)perylene	0.14	pounds	0.15				
Benzyl chloride	3685.00	pounds	3904.93	1.905	Any Increase	-1.892	
Biphenyl	8.95	pounds	9.48	0.464	Any Increase	-0.464	
Bis(2-ethylhexyl)phthalate (	384.29	pounds	407.23				
Bromoform	205.31	pounds	217.56	1.902	Any Increase	-1.902	
Carbon disulfide	684.36	pounds	725.20	11.46	Any Increase	-11.457	
2-Chloroacetophenone	36.85	pounds	39.05	0.116	Any Increase	-0.116	
Chlorobenzene	115.81	pounds	122.73	16.942	Any Increase	-16.941	
Chloroform	310.59	pounds	329.13	17.968	Any Increase	-17.967	
Chrysene	0.53	pounds	0.56				
Cumene	27.80	pounds	29.57	60.45	Any Increase	-60.45	
Cyanide	13160.73	pounds	13948.18				
2,4-Dinitrotoluene	1.47	pounds	1.56				
Dimethyl sulfate	252.69	pounds	267.77	0.19	Any Increase	-0.189	
Ethyl benzene	494.84	pounds	524.38	159.783	Any Increase	-159.781	
Ethyl chloride	221.10	pounds	234.30	97.11	Any Increase	-97.109	
Ethylene dichloride	210.57	pounds	223.14	14.895	Any Increase	-14.894	
Ethylene dibromide	6.32	pounds	6.69				
Fluoranthene	3.74	pounds	3.96				
Fluorene	4.79	pounds	5.08				
Formaldehyde	375.14	pounds	397.37	0.045	Any Increase	-0.044	
Hexane	352.71	pounds	373.76	648.553	Any Increase	-648.552	
Indeno(1,2,3-cd)pyrene	0.32	pounds	0.34				
Isophorone	3053.29	pounds	3235.51	8.762	Any Increase	-8.751	
Methyl bromide	842.29	pounds	892.56	1.429	Any Increase	-1.426	
Methyl chloride	2790.07	pounds	2956.59	37.997	Any Increase	-37.986	
5-Methyl chrysene	0.12	pounds	0.12				
Methyl ethyl ketone	2053.07	pounds	2175.80	217.037	Any Increase	-217.03	
Methyl hydrazine	894.93	pounds	948.34	0.007	Any Increase	-0.004	
Methyl methacrylate	105.29	pounds	111.57	75.353	Any Increase	-75.353	
Methyl tert butyl ether	184.25	pounds	195.25	53.082	Any Increase	-53.082	
Methylene chloride	1526.64	pounds	1617.76	63.915	Any Increase	-63.909	
Naphthalene	68.44	pounds	72.52	19.294	Any Increase	-19.294	
Phenanthrene	14.21	pounds	15.06				
Phenol	84.23	pounds	89.26	7.082	Any Increase	-7.082	
Propionaldehyde	2000.43	pounds	2119.82				
Pyrene	1.74	pounds	1.84				
Tetrachloroethylene	228.36	pounds	239.87	62.387	Any Increase	-62.386	
Toluene	175.07	pounds	185.44	69.333	Any Increase	-69.332	
1,1,1-Trichloroethane	105.29	pounds	111.57	702.842	Any Increase	-702.842	
Styrene	131.81	pounds	139.46	31.355	Any Increase	-31.354	
Xylenes	194.78	pounds	206.40	159.783	Any Increase	-159.782	
Vinyl acetate	40.01	pounds	42.40	12.958	Any Increase	-12.957	
Total PCDD/PCDF	0.000250093	pounds	0.000264911				
Acid Gases							
Hydrogen Chloride	96244.72	pounds	100077.81				
Hydrogen Fluoride	19393.97	pounds	20313.00				

ASSUMPTIONS:
All increases / decreases based on coal use only. Fuel oil & other bulk chemical chemical use not expected to change.
Estimated 15% nominal reduction with new LNBs over old.
Estimated 4% nominal removal efficiency improvement in scrubber efficiency.
HAPs PSD triggers calculated per UDAQ Dispersion Modeling Guidelines.
VOC's calculated from HAPs list.

CALL: V. PETERSON - 1413
K. NAND - PARSONS.

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MARK SUEL - EPA OAQPS @RTP - INTRODUCTORY COURSE -
LEON LEONARD - AWMA LOCAL REP -
GARY McCUTCHEN - RTP ENV. ASSOC.
MARK JOHNSON - chem lime Co.
KEN WEISS - ERM

NOTE: - If Emission Factor changes - Look At Previous Work To Make Sure PSD Not Triggered.

FIND MEMOS on 51.166(23)(ii)

CHECK Regs For "Temporary" Sources - Guidance etc. Up To 2 yr still Requi BACT if major

⇒ Verifying State Regs & SIP Have Adopted - Using WEPCO Approach.