MEMORANDUM

INTERMOUNTAIN POWER SERVICE CORPORATION

TO: Jerry Hintze

FROM: Aaron Nissen

DATE: July 15, 2002

SUBJECT: HP TURBINE- CONTRACT PENALTIES AND INCENTIVES

Based upon our interpretation of the HP Turbine Contract Incentives and Penalties, Alstom owes IPSC the net sum of $105,000.

SUMMARY

Item #1 HP Eff Incentive		$90,000
Item #2 HP WP	NO Penalty or Incentive	
Item #3 HP TF	Penalty	$195,000
Net Total (Alstom owes)		$105,000

Item #1 HP Turbine Efficiency
HP Eff guarantee= 92.2%
HP Eff test average= 92.80%
Difference= 0.60% (better)

Incentive: (division D1, section 8- liquidated damages/ incentives, 6th paragraph), for each complete 0.1% (not rounded) (corrected for actual operating conditions) above guarantee (no test tolerance applied on incentive), IPSC will pay $15,000 (up to a maximum of $200,000).

Incentive: =0.60% *($15,000 / 0.1%)= **$90,000**

Item #2 HP Wheel Power (or HP swallowing Capacity)
HP Wheel Power guarantee= 299.0 MW (U2)
HP Wheel Power test average= 303.0 MW
Difference= 4.0 MW (better)

HP Swallowing Capacity= 6900 kpph
HP Swallowing Capacity test average= 7071 kpph

Difference= 171.0 kpph or 2.48% (worse)

Incentive: (division D1, section 8- liquidated damages/ incentives, 8th & 9th paragraph), No incentives stated only penalties

Incentive: = **$0**

Item #3 HP Throttle Flow
HP Throttle Flow guarantee= 6975 kpph
HP Throttle Flow test average= 7071 kpph
Difference= 96.0 kpph or 1.38% (worse)

Penalty: (division D1, section 8- liquidated damages/ incentives, 7th paragraph), for each complete 0.1% (not rounded) (corrected for actual operating conditions) above guarantee (no test tolerance applied on incentive), IPSC will pay $15,000

Penalty: =1.3% (not rounded up)*($15,000 / 0.1%)= **$195,000**

U2 HP Turbine Upgrade Acceptance Test Results Summary

	Acceptance Tests		Confirmation Tests				Pre-
	Test 7	Test 8	Test 9	Test 10	Average	Guarantee	Upgrade
HP Turbine Efficiency (%)	92.85	92.83	92.72	92.80	92.80	92.20	83.48
HP Turbine Wheel Power (Mw)	302.9	304.5	300.4	304.4	303.02	299.0	259.4
Throttle Flow (kpph)	7,074	7,078	7,063	7,070	7,071	6,900	6,412
IP Turbine Efficiency (%)	92.01	92.06	92.17	91.05	91.82		91.23
Net Turbine Cycle Heat Rate (Btu/kwh)	7,701	7,636	7,671	7,676	7,671	7,683	7,807
Gross Power (Mw)	989.4	989.5	987.8	988.2	988.7	973.2	875.3

Notes:
All tests conducted at turbine throttle valves wide-open.
Tests 7 & 8 conducted by PGT with test instrumentation. Refer to the Thermal Performance Test Results on Intermountain Power Project (IPP) Unit #2 Turbine Cycle test report (April 2002) for additional information.
Tests 9, 10 & upgrade tested using station instrumentation corrected to test instruments readings.
HP turbine efficiency - PGT test uncertainty ±0.346%, enthalpy drop efficiency calculated with inlet conditions measured before stop valves, exhaust measured after balance gland leakage flow mix.
HP turbine wheel power - PGT test uncertainty ±2.508%, throttle flow corrected to design conditions (2412.2 psia, 1000°).
Throttle flow - PGT test uncertainty ±2.510%, corrected to design throttle conditions (2412.2 psia, 1000°).
IP turbine efficiency - Enthalpy drop efficiency calculated with inlet conditions measured before combined reheat valves and exhaust measured at LP-A turbine inlet (PGT), 14th stage extraction (Station).
Net turbine cycle heat rate - PGT test uncertainty ±2.554%, test heat rate was adjusted to PGT test values and corrected to design throttle & reheat conditions, design turbine back pressure, and contract cycle using station pepse model.
Gross power - PGT test uncertainty ±0.459%, station measurement corrected to PGT test measurements and corrected to design throttle & reheat conditions, design turbine back-pressure, 6.9% reheat pressure drop, and contract cycle using station pepse model.

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