HP Turb Design Info
Alstom

INTERMOUNTAIN HP TURBINE RETROFIT

1. Assessment of Interfacing Systems

The contract with ALSTOM Power for the HP turbine retrofit includes for assessment of the following steam turbine auxiliary systems to ensure safe and efficient operation of the HP turbine retrofit:

Gland steam sealing system
Turbine drains system
Lubricating oil system
Governor and control system
Instrumentation and protection equipment

The contract includes for essential modifications to the steam turbine governing system to facilitate operation in full arc admission mode. Assessments of the remaining steam turbine auxiliary systems listed above are not expected to reveal any essential modifications specifically to permit safe and efficient operation of the HP turbine retrofit equipment. No allowance is included under the contract for any additional modifications or rectifications of steam turbine auxiliary systems.

The boiler main steam flow and steam conditions at other interfaces with the HP turbine as identified in (2) below) will be established at the start of the HP turbine retrofit contract. It is anticipated that IPSC may require the services of a boiler supplier/consultant to assess what modifications (if any) are required to the existing boilers to achieve the increased main steam flow at the nominated terminal conditions. ALSTOM Power, under the HP turbine retrofit contract, will assist IPSC by providing information on revised cycle conditions at boiler interfaces.

It is also anticipated that IPSC may wish to contract with other equipment suppliers/consultants to assess the need for modifications to other plant systems to permit operation with increased steam mass flow and increased electrical output (e.g. generator, boiler feed pumps, boiler feed pump turbines, feedwater heaters). Under the HP turbine retrofit contract, ALSTOM Power will assist IPSC in these studies by providing information on revised cycle conditions at interfaces with other equipment.

2. Definition of Thermodynamic Design Requirements

In order to ensure delivery of the HP turbine retrofit to the Intermountain site in advance of the March 2002 installation outage, design work has already started in order to provide definitions for purchasing the major castings and rotor forging. Definition of these major components necessitates establishing steam path details requiring confirmation of thermodynamic design data. The majority of these data have already been advised, as follows:

Main steam flow	6.9 Mlb/h at 2400 psig/1000 °F

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HP valve pressure drop	3% (derived from information supplied by IPSC)
Steam admission arrangement	Full arc admission
HP exhaust pressure	Derived from information supplied by IPSC on the basis that the IP capacity has been confirmed unchanged.

The only item outstanding which IPSC must define *as soon as possible* is the HP turbine extraction pressure. Information has already been provided to illustrate the effect of varying the extraction pressure on final feedwater temperature and on HP shaft power, unit output and unit heat rate. It is anticipated that IPSC will fix the HP turbine extraction pressure (i.e. from after HP Stage 4 or after HP Stage 5) by Friday 19 January, 2001. If IPSC requires any further advice in making this choice, ALSTOM Power will be pleased to assist.

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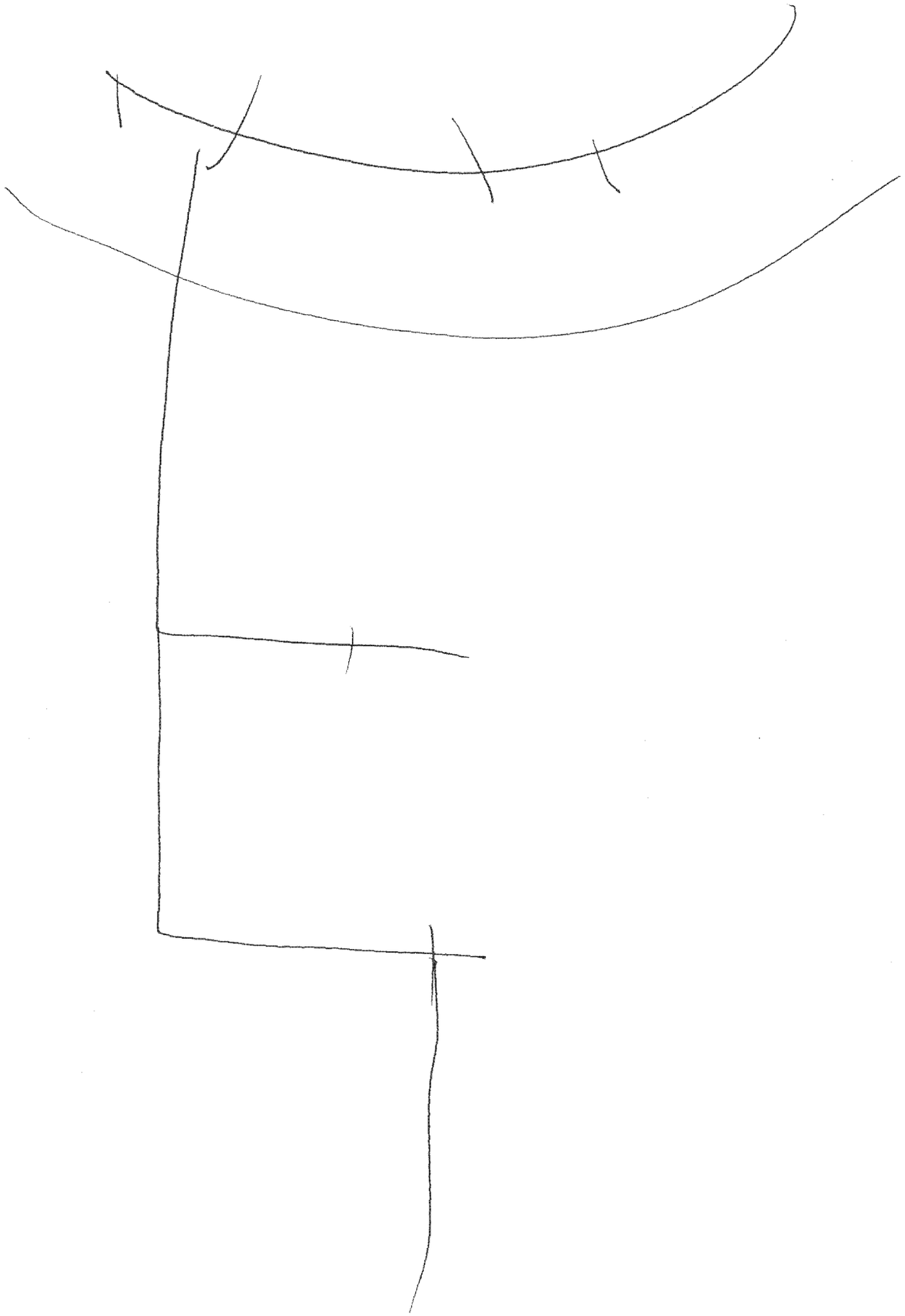

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