Scope of Work

H.P Outer Casing- Inlet End of Steam Turbine in finish machined condition is proposed to be subcontracted for Finish Machining work as per machining details & technical requirements furnished in drg.no. 01052630500.

H.P Outer Casing- Inlet End raw material with material specification HW19688 and casting Drg.01052630901 will be sent.

A) **Scope of work at BHEL, Haridwar:**

- Control marking
- All the connection and plates (item no. 2 to 4) shall be weld and assembled before hydraulic test at BHEL Haridwar.
- Hydraulic testing after complete machining shall be done at BHEL Haridwar.
- All operations detailed in section Z1-Z1, Z2-Z2, and View-Z3 on sheet-3 shall be carried out at the BHEL Haridwar works.

B) Scope of Work for vendor:

Vendor to carry out complete finish machining of Outer Casing -Inlet end as per machining details & technical requirements furnished in drg.no. 01052630500 consideration of following points:

- Machining should be carried out taking care of Rough machined (Casting) drg. as well as finish machined drg. Technical requirements specified in the rough machined drg. should be taken care of before carrying out finish machining.
- Vendor to machine details with reference to Guide dia. 2120 +0.2+0.1 (D) (Detail J, H & L; Sheet- 3) in **one setting**, maintaining required relative accuracies as per drg. are:
  - I-ring groove detail (Groove detail with ID 1490+/-0.2. Refer Detail L, Sheet-3)

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TUM-PLG	Manoj Kr Gupta, Sr. Mgr.		02.08.25

- U-Seal sitting area & step detail (Refer Detail H, Sheet -3. Steps, faces & complete Detail with Dia. 1772 H7).
- Step face at 95-0.03mm from Top face (B) & details (Refer View H, Zone N-3, sheet -3).
- Shaft seal bores (Refer Detail J, Sheet -3. Inner dia. 840+0.09, 800 etc with steps & faces).
- Dimension 110 and all the bracketed dimension is a reference dimensions only (refer details G, Sheet-3).
- 50%-dimension values and dimension appears without brackets are to be maintained as per drg. after machining bosses as per drawing dimension.
- Buttress thread (Detail H & F. Thread with I.D 1865+0.2 mm & pitch 50 mm) machining is to be done before finish machining of the details as referred in point no.-1.
- Final machining cuts on these areas requiring high relative accuracy tolerances should be taken within short span of time in one go. These dimensions & runouts etc. should be checked & recorded by vendor's quality department after complete machining of job & before unloading job from machine.
- Other details requiring relative accuracies shall be as per drawing.

C) Important points: Vendor to note following important points:

- All other requirements of QP, Standards and technical requirements specified on the drawings to followed.
- No flaws like blow holes, shrinkage, inclusions etc. should open up during machining. However, if any flaw opens up during machining, vendor shall immediately intimate detail and location of flaw and corrective action

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proposed. Further machining will be suspended till BHEL approves corrective action.

- BHEL shall furnish clarifications, if any, w.r.to scope of work or drg. dimensions / technical requirements to the vendor to enable it to submit technical / commercial offer.
- Party must ensure that all requirements indicated in the drg. regarding:
  - Surface finishes (Ra value indicated in microns).
  - Sizes and tolerances.
  - Geometrical accuracies e.g. run-outs, concentricity, parallelity, perpendicularity etc. shall be fully met.
  - Reference surfaces are clearly marked in the concerned drawings.

D) After finish machining, inspection report is to be submitted to BHEL for final clearance.

E) Inspection of the job at supplier's works shall be carried out as per BHEL approved quality plan by BHEL/ agency authorized by BHEL for which adequate prior notice (min. 4weeks) shall be given by the supplier.

F) <u>Packing & Preservation:</u>

- Conserve components as per BHEL's conservation instructions (Table-1 of ST 33004) suitable for 6 months. ***PAINT IS NOT ALLOWED*** on any surface. If as per ST33004 the outer unmachined surface of any component is specified to be painted, this requirement should be disregarded. Instead, the unmachined surface should be conserved in the same manner as the machined surface, following the conservation requirements outlined in ST33004.
- Cover joint plane flanges with plywood + rubber sandwiching (e.g., 10 mm rubber + 20 mm plywood) using suitable bracket and other critical machined surfaces with plastic/rubberized caps/wooden protectors to prevent mechanical damage.
- Wrap large components with a minimum 90 GSM polythene sheet, and enclose them with industrial-grade shrink wrap.

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- Place components on strong suitable wooden skids or metal base frames with sufficient load-bearing capacity.
- Ensure that all lifting lugs and bollards are clearly marked and easily accessible, as lifting and handling of the component together with its skid shall be carried out using the bollards provided on the component.
- Use shock-absorbing materials (e.g., rubber pads) between the component and the skid/base to avoid impact damage during transport.
- Lock components with appropriate metallic strap/ slings or belts with skid after wrapping and placement on skids/base frames.
- Ensure packaging is durable enough to withstand the weight of the components and Packing of the finish machined component should be suitable to protect damage to machined surfaces during handling and transportation.

G) All cross-referred documents given in Annexure-I.

ANNEXURE-I

List of drawings / standards to be referred

1. **Casting for HP Outer Casing-Inlet End (Rough machined):** 0-10526-30901
2. **HP Outer Casing-Inlet End (Finish machined drawing):** 0-10526-30500
3. **Log Sheet:** 0-10526-30500 LS
4. **Material Specification:** HW19688
5. **Product Standard:** ST01013, ST01030
6. **Packing & Preservation.....** ST33004

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