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**SPECIFICATION NO: BM/NBS: 001**

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	<b>SPECIFICATION FOR NITROGEN BLANKETING SYSTEM</b>	SPECIFICATION NO.: <b>BM/NBS:001</b>	
		SECTION: Boiler Mountings/PE (FB)	
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- I. This Specification covers the Design, Manufacture and supply of **Nitrogen Blanketing System** for Pressure Parts of Boiler for Preservation during short and long shutdown for both Dry and Wet Preservation.

## II. Scope of Supply:


1. Supply Manifold: Refer Drawing No.**2-24-865-01887**.
2. 21 no. High pressure cylinders of capacity ~47L, filled with Nitrogen at 160 kg/cm<sup>2</sup>(g).
3. Required connections from Nitrogen Cylinders to manifold including all the accessories (connectors, Pigtail hoses/ flexible hoses with suitable leak proof connectors/Couplings/flanges, gaskets for flanges etc.)
4. Isolating Ball Valves as per ANSI / ASME or equivalent Standard.
5. One Pressure Indicator (as per specification TCI:101) each in the manifold and in the downstream piping with required piping, condensing loop, isolation valve and 3-way valve.
6. Pressure regulating valve as per ANSI / ASME or equivalent Standard.
7. Pressure relief valve as per ANSI / ASME or equivalent Standard.
8. All necessary mating Flanges, Fasteners, Gasket, Sockets at the Terminal point. Kindly note that BHEL Terminal point will be NB50 pipe. (OD 60.3mm)
9. All necessary supports and supporting structures for the supply manifold and for piping which is in supplier scope. Structural base and support (incl. canopy), chain and hook arrangement for holding the cylinders should be provided by the supplier.
10. The system shall be complete within the scope of supplier. All the necessary equipment / attachments / peripheral members required for the erection & commissioning of the system shall be supplied.
11. No of System per Boiler: **1 Independent system** per Boiler.
12. One set of all gaskets, O rings, packing and seals applicable in the system shall be supplied for site hydraulic test.

## III. Design:

- The Nitrogen Blanketing system design parameters (Pressure, Flow etc.) shall be as per the P&ID 2-24-865-01887.

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- Supplier shall provide equipment and components in accordance with the supplier's standard vendors with proven track record, unless otherwise specified by BHEL. Equipment or components not listed shall be as per Supplier's standard.
- **Nitrogen cylinders should be supplied as per ISI standard. The capacity shall be approximately 47L. Design pressure of the cylinder shall be 160 kg/cm<sup>2</sup>g. The cylinders shall be designed as per the standard IS 7285: Part-II: 2004.**
- **The pressure throttling valve shall be self-regulating valves. The controllability range shall be 1:30. The valve inlet and outlet pressure are 30-160 kg/cm<sup>2</sup>(g) and 5-10 kg/cm<sup>2</sup>(g) respectively. Full pressure of 160 kg/cm<sup>2</sup>g will be available in the valve upstream side and gradually as the Nitrogen flows out, the pressure will reduce. The downstream pressure shall be constantly maintained in the range 5-10 kg/cm<sup>2</sup>(g) by the valve.**
- For Manifold design, enough clearance between the tapping's shall be provided consider the cylinder size for easy replacement/maintenance.
- The relief valve opening pressure shall be factory set at 15 kg/cm<sup>2</sup>(g) and same shall be adjustable at site if required.
- All piping furnished by the Supplier shall be provided in ASME standard sizes in nominal Metric units (DN sizes). All weld end preparations, socket weld couplings, threaded connections, flange sizes and ratings, at BHEL/Supplier terminal points shall comply with ASME/ANSI standards in Metric units.
- Valve design shall be in accordance with ASME B16.34.
- Material of Construction for Valves and Manifolds shall be SA106 Gr B/ SA06 Gr C/ SA105 or equivalent.
- All flanged connections, if applicable, shall be supplied in accordance with the requirements of ASME B16.5.
- All materials shall be new and in accordance with applicable ASTM specifications or with other recognized standards such as SAE.
- The use of asbestos or material containing asbestos shall not be permitted. The use of mercury or material containing mercury shall not be permitted. All non-metallic materials shall be submitted to BHEL for approval.
- The equipment and materials specified are intended to be the minimum suitable for the intended service. They are not intended to limit the Supplier's responsibility for

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proper design and selection of equipment. It is the Supplier's responsibility to bid a complete system for the intended service and the specification is only for general guidelines. Any changes in proposed equipment or materials during design shall be approved by BHEL.

- The Supplier shall be governed by the applicable regulations, codes, and standards, including their latest respective addenda, amendments, and errata. The supplier should satisfy the above internally before submission to BHEL.

#### IV. Terminal Points


As per the drawing **2-24-865-01887**.

#### V. Documents and Data by Supplier

- Supplier shall submit Arrangement drawings, Bill of material, calculations (if required), specifications (other than international standards/ codes if used) for approval. (1 set during offer stage and one after order placement)
- The Supplier shall provide dimensional outline drawings of the assembled unit(s). The drawings shall show overall dimensions, terminal box dimensions, mounting connections, clearances required for proper installation and maintenance shall state lifting requirements, and the weights of all major components. In addition to the sectional drawing, supplier has to provide isometric drawing also.
- All drawings, calculations, specifications, bills of materials and other data submitted shall be in Metric units. Metric units shall comply with the International SI System.
- Instrument list and Instrument data sheet(s) (ISA format or equal)
- Test certificates.
- O&M instructions for all items concerned.

#### VI. Testing

- Valves shall be tested in accordance with the latest applicable standards and codes.
- Complete system shall be hydraulically tested at 1.5 times the design pressure of the system (Cylinder pressure).

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- Complete system shall be tested for functionality of all the components including the pressure relief valve and regulating valve.

## **VII. Additional requirements**

- Painting shall be as per manufacturer standard.
- Machined surfaces shall be suitably protected.
- Valve ends shall be protected by means of metallic covers/polythene caps/rubber and protectors to prevent damage to ends & also to avoid foreign material entering the valve while shipment & storage.
- All components shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site.
- Valve tag nos. shall also be incorporated in all the dispatch documents.
- All unpainted surfaces shall be protected with a rust preventive, which can be removed by solvent washing. The use of grease or oil other than light grade mineral oil for corrosion protection is prohibited.
- All exposed machined surfaces shall be coated with suitable rust preventative coating prior to shipment.
- Supplier shall adequately crate, block, anchor and protect equipment as required to prevent damage during transit shipment and outdoor storage for a period of one (1) year at the site.
- All threaded connections shall be plugged or capped with standard pipe plugs or caps.
- List of spares shall be quoted if applicable.
- At the request of purchaser, vendor shall depute a Field engineer to provide technical assistance during erection and commissioning.