

TD-106 Rev No. 00	Form No.	 HYDERABAD	PRODUCT STANDARD PUMPS HYDERABAD		FP60310 Rev No. 01 Page 1 of 5
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.		<u>AUXILIARY SKID FOR MECHANICAL SEAL</u> <u>(660MW & 800MW PROJECTS)</u> 1.0.0 INTENT OF SPECIFICATION : This specification covers the technical requirements of auxiliary skid for Mechanical seals. 2.0.0 SCOPE OF SUPPLY: 2.1.0 The scope of supply shall include design, engineering, manufacturing, inspection, testing, packing and supply of the mechanical seal auxiliary skid. 2.1.1 Duplex coolers (2x100%) with a changeover valve on seal water side of each mechanical seal on coupling side & end side. Isolation valves at Flushing water and Cooling water inlet and outlet of each cooler. 2.1.2 Duplex filters (2x100%) with a changeover valve for each mechanical seal on coupling side & end side. Isolation valves at Flushing water inlet & outlet of each filter. 2.1.3 Isolation valves (ball valve) at CW inlet & outlet and FW inlet & outlet of the skid. The valves shall be capable of handling process fluid at 120 degC. 2.1.4 Thermowell sinks at CW & SW inlet and outlet for temperature indicators & RTDs. Immersion length of RTD is 155mm with ½" NPT connection. 2.1.5 Flushing water and cooling water inlet and outlet connections shall be terminated with SWRF flanges along with counter flanges, Gaskets, Bolts & Nuts. Non-Asbestos gaskets at cooling water flange joints and metallic gaskets at flushing water flange joints. Bolts shall be made of ASTM A193 B7 & Nuts made of ASTM A194 Gr. 7. 2.1.6 Orifice with a pilot hole shall be provided at cooling water outlet terminal flanges of the skid. 2.1.7 Flushing water, Cooling water piping, pipe fittings, valves & flanges made of SS316 material. 2.1.8 Pipe and pipe fittings of schedule 80 shall be used. Pipe fittings shall be BW type as per ASME B16.5. Valves shall be SW type of class 800 as per ASME B31.1. Flange shall be SWRF type of class 600 for FW lines and class 150 for CW lines as per ASME B16.5. 2.1.9 All CW & FW pipe & pipe fittings shall be of size DN25 except for CW inlet & outlet header which shall be DN50. 2.1.10 Pressure gauge process connection, ½" NPT shall be provided at FW inlet & outlet, cooling water to jacket cooling, inlet & outlet and at CW inlet & outlet header of the skid (12 per skid). 2.1.11 Flow glass indicator of SW type shall be provided on cooling water outlet header. 2.1.12 Metallic threaded plugs to be provided for Thermowell and Pressure gauge process connections. No opening shall be left uncovered.			
		Ref. Doc	Revisions : Refer to record of revisions :	Prepared : ASK	Approved : MSR



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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company. Ref Doc 3.0.0 TECHNICAL REQUIREMENTS: 3.1.0 Technical Data: <table border="0"> <tr><td>Design Heat Load per cooler</td><td>:</td><td>36 kW</td></tr> <tr><td>CW inlet temperature</td><td>:</td><td>38 deg.C</td></tr> <tr><td>CW Design temp rise</td><td>:</td><td>3 deg.C</td></tr> <tr><td>CW supply pressure</td><td>:</td><td>10 kg/cm² max.</td></tr> <tr><td>CW operating pressure</td><td>:</td><td>6 kg/cm².</td></tr> <tr><td>CW downstream pressure</td><td>:</td><td>4.5 kg/ cm².</td></tr> <tr><td>Pressure drop across cooler</td><td>:</td><td>0.5 kg/cm² max. (*) design Pr. Drop to be indicated</td></tr> <tr><td>Pressure drop across filter</td><td>:</td><td>0.5 kg/cm² max. (*) design Pr. Drop to be indicated</td></tr> <tr><td>CW flow rate/cooler</td><td>:</td><td>(*) to be indicated by manufacturer</td></tr> <tr><td>Cooler tube material</td><td>:</td><td>SS316</td></tr> <tr><td>Cooler shell material</td><td>:</td><td>SS304/ SS316/ CF8M</td></tr> </table> 3.2.0 Skid shall consist of two Independent cooling circuits for coupling side mechanical seal and end side mechanical seal. Each cooling circuit shall consist of 2x100% coolers (one working and one standby) and 2x100% magnetic filters (one working and one standby) for each circuit. Magnetic Filter assembly shall have strainer element along with magnetic separator 3.3.0 Both coupling side and end side seal auxiliaries shall be mounted on one single skid along with necessary valves, piping and pipe fittings. Both circuits shall be separated along the vertical span of the skid to facilitate ease of operation and handling. Refer coordination drawing. 3.4.0 Coolers shall be designed suitably for the cooling water data given at 3.1.0. 3.5.0 Heat transfer area of each cooler shall have a margin of not less than 20% over the design heat load indicated at 3.1.0. 3.6.0 Coolers shall be vertically mounted and the general arrangement of the skid shall be as per the coordination drawing. 3.7.0 The Metal frame of the skid shall be painted as per code 'Bb' indicated at annexure II of HY0674162. Color shall be light grey (631) as per IS: 5. Painting shall not be done for Stainless steel components. 4.0.0 DRAWINGS/DATA TO BE FURNISHED ALONG WITH OFFER: - Seal cooler heat load sizing calculation. - Outline and sectional assembly drawing of Cooler. - Outline and sectional assembly drawing of Magnetic Filter. - Mechanical seal auxiliary skid P&ID and assembly drawing. - Details & schematic of the changeover valve & isolation valve. 5.0.0 INFORMATION TO BE FURNISHED AFTER AWARD OF CONTRACT 5.1.0 Drawings/Data indicated at 4.0.0 shall be furnished against PO for BHEL approval. 5.2.0 Quality assurance plan of the skid.					Design Heat Load per cooler	:	36 kW	CW inlet temperature	:	38 deg.C	CW Design temp rise	:	3 deg.C	CW supply pressure	:	10 kg/cm ² max.	CW operating pressure	:	6 kg/cm ² .	CW downstream pressure	:	4.5 kg/ cm ² .	Pressure drop across cooler	:	0.5 kg/cm ² max. (*) design Pr. Drop to be indicated	Pressure drop across filter	:	0.5 kg/cm ² max. (*) design Pr. Drop to be indicated	CW flow rate/cooler	:	(*) to be indicated by manufacturer	Cooler tube material	:	SS316	Cooler shell material	:	SS304/ SS316/ CF8M
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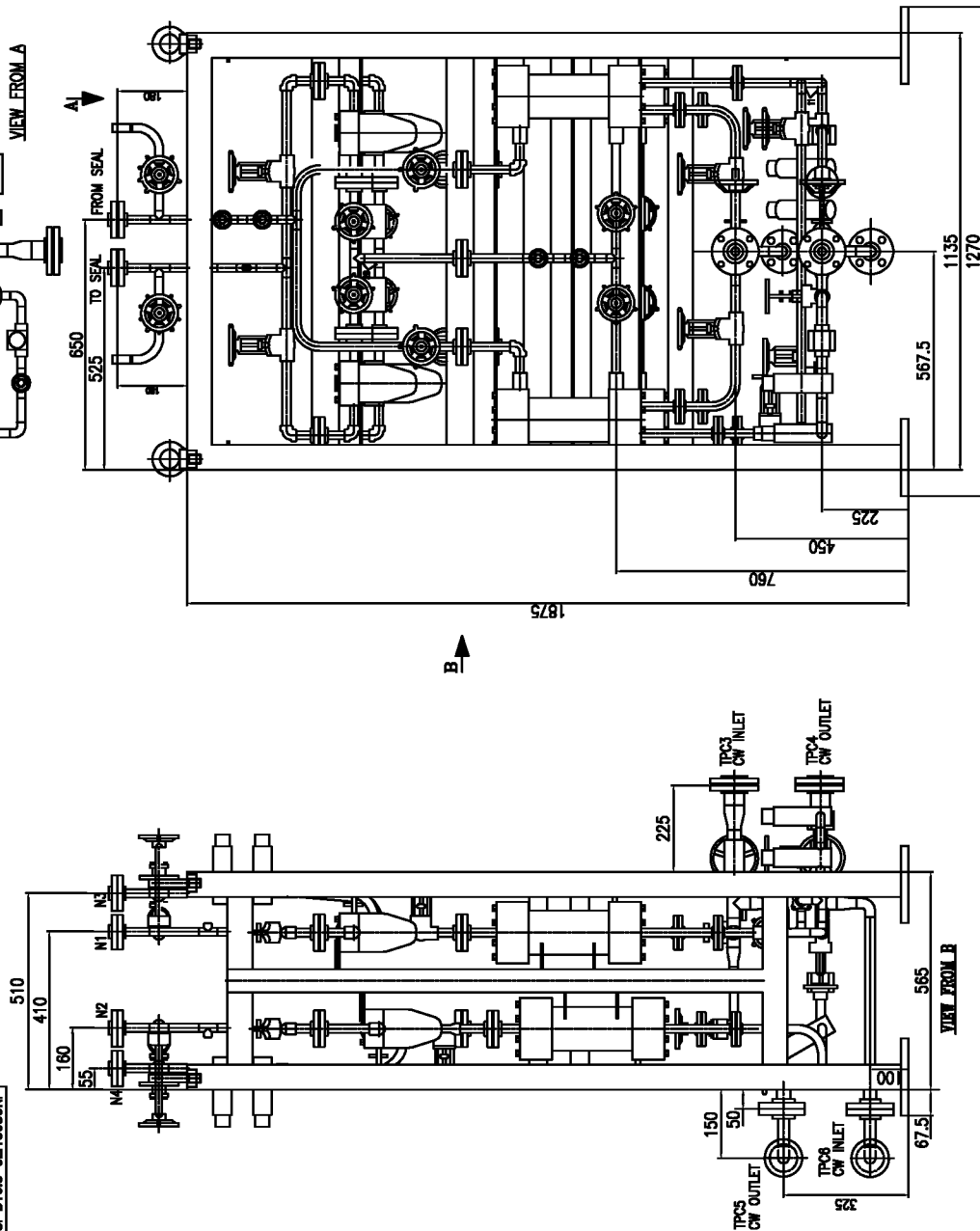
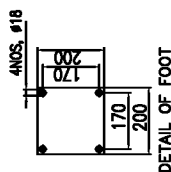
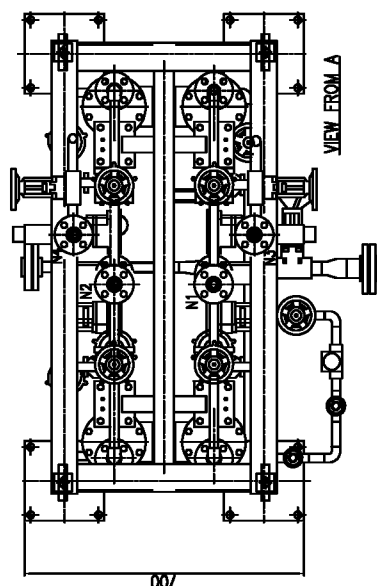
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company. Ref Doc 6.0.0 TESTS & CERTIFICATES: 6.1.0 Coolers, filters and thermometer sinks shall be hydro tested independently. 6.2.0 Hydro test on Cooler shall be conducted at 100 Kg/cm² on the shell side & 20 kg/cm² on the tube side and test report shall be furnished. 6.3.0 Hydro test on seal water piping shall be conducted at 100 Kg/cm² and 20 Kg/cm² on cooling water piping, along with pipe fittings and test reports shall be furnished. 7.0.0 PACKING: The auxiliaries skid shall be packed to ensure its capability to withstand transit risks without damage. The seal Skids shall be packed with polythene cover and wooden box/crate; additional GI sheet (1.6mm thick) covering either from inside the package or outside the package shall be carried out. 8.0.0 MARKING: 8.1.0 A name plate containing following details shall be riveted or fixed by screws to the metal frame of each auxiliary seal skid consignment. BHEL 12 digit material code, Description of the component, Purchase Order No., Name of the Manufacturer, Month and Year of Supply shall be clearly visible. 8.2.0 Following details shall be marked on the packing case. - Name of manufacturer - Material Code and Description of the component - BHEL Purchase order number. 9.0.0 VARIANT TABLE: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">VAR. NO.</th> <th style="width: 55%;">DESCRIPTION & MAKE OF SEAL</th> <th style="width: 30%;">MATERIAL CODE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">00</td> <td>Mechanical Seal Auxiliary Skid.</td> <td style="text-align: center;">FP9760310007</td> </tr> </tbody> </table>					VAR. NO.	DESCRIPTION & MAKE OF SEAL	MATERIAL CODE	00	Mechanical Seal Auxiliary Skid.	FP9760310007
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GENERAL ARRANGEMENT OF SKID

TERMINAL POINT DETAIL				
MARK	SIZE	ANSI RATING	SERVICE	REMARK
N1	1"	#600	TO SEAL (OE)	ANSI B16.5 CL600SORF
N2	1"	#600	TO SEAL (NDE)	ANSI B16.5 CL600SORF
N3	1"	#600	FROM SEAL (OE)	ANSI B16.5 CL600SORF
N4	1"	#600	FROM SEAL (NDE)	ANSI B16.5 CL600SORF
TPC 3	2"	#150	COOLING WATER INLET	ANSI B16.5 CL150SORF
TPC 4	2"	#150	COOLING WATER OUTLET	ANSI B16.5 CL150SORF
TPC 5	1 1/2"	#150	COOLING WATER OUTLET	ANSI B16.5 CL150SORF
TPC 6	1 1/2"	#150	COOLING WATER INLET	ANSI B16.5 CL150SORF



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RECORD OF REVISIONS						
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	01	01.09.19	Spec. revised to update scope of supply, technical requirements & hydro test pressures.	ASK	MSR	

