

Air Cooled Condenser for 3X660MW North Karanpura
Technical Clarification No. 1 Dtd 08.10.2016

Sl.No.	Section, Clause reference	Bidding Document Clause	Bidder's Query	BHEL Reply
1	HE57067 Rev.02 , Page 4 of 122,I.1 scope of proposal i.Xiii-a.	3-D model of complete package together with all necessary piping, valves, fittings supports, pumps and drive etc.	We shall provide the 2-D drawings of complete package along with all necessary piping, valves, fittings supports, pump drive etc.	Bidder to comply the specification requirement. Ref clause XIV.2 and annexure- XIV.2-1
2	HE57067 Rev.02 , Page 10 of 122,III.1.2.Cat-3.ii	BHEL and Bidder to jointly demonstrate to NTPC that air leakage to ACC shall not exceed 50% of design value taken for sizing of vacuum pumps.	We shall design/provide the vacuum pump selection based on design flow with 20% excess non condensable over the values given in HEI standards	Air Evacuation system is to be designed as per HEI. Bidder's query /deviation is not applicable against referred clause.
3	HE57067 Rev.02 , Page 19 of 122,IV. 3.2	Bidder to furnish thermal calculation for required area as per HEI and the total pressure drop from steam entering the horizontal duct to steam entering tube bundle.	We shall provide the technical data sheet of ACC . We cannot provide thermal calculations and pressure drop calculations since they are proprietary in nature	Bidder to furnish the thermal calculations and pressure drop calculations as per method/ formulae given in HEI. Bidder to use the proprietary values directly in the calculation as it is.
4	HE57067 Rev.02 , Page 20&21 of 122,IV. 3.13	The design of the condenser shall avoid condensate sub-cooling under all operating conditions including part load as per HEI. The condensate inside condensate tank shall not be below the temperature indicated in the input data as per clause IV.3.3. Air removal section to cool the air and vapor mixture to at least 4.17 deg.C below steam saturation temperature at the effective suction pressure . connections to air evacuation pumps shall be made at this section. Condenser to be designed for minimum air leakage and under normal	We shall design the vacuum system based on 20% more non condensable quantity over HEI recommended values .	Air Evacuation system is to be designed as per HEI. Bidder's query /deviation is not applicable against referred clause.

		operating conditions, the air leakage in the condenser not to exceed more than 50% of design value taken for sizing of vacuum pumps . The same shall be demonstrated at site under actual operating condition failing which bidder shall carryout necessary modifications.		
5	HE57067 Rev.02 , Page 22 of 122,IV. 3.30	Bidder shall provide performance curve along with the bid to indicate losses and gains in ACC performance as the ambient air temperature rises an falls from the contract guarantee value. Bidder to furnish the thermal, mechanical and hydraulic calculation as per relevant standards during detail engineering for approval.	We shall provide the ACC performance curve along with our offer. From the graph we can read the back pressure for various ambient temperatures at different steam flows into ACC. Thermal, mechanical and hydraulic calculations cannot be provided since they are proprietary.	Bidder to furnish the thermal, mechanical and hydraulic calculations. Bidder to use the proprietary values directly in the calculation as it is.
6	HE57067 Rev.02 , Page 31 of 122,IV. 4.4.9	Type test for performance (Heat transfer coefficient) of tube bundles using scaled down model or full size model of type offered for this project shall be conduct which shall be witnessed by BHEL. Procedure shall be submitted by bidder for BHEL approval.	We shall not provide any type test for tube bundle ,valves, bellow etc.	Bidder to comply the specification requirement.
7	HE57067 Rev.02 , Page 33 of 122,IV. 4.5.1.20	Type test of fan using scaled down model or full size model (applicable for the project) for performance, noise and vibration at full speed, 110%,75%,50% and 25% speed shall be conducted as per procedure. The test of fan shall be witnessed by BHEL. Procedure of testing to be submitted to BHEL.	We shall not provide any type test for fan etc	Bidder to comply the specification requirement.

8	Annexure-IV.3.1		According to Annexure-IV.3.1, the guaranteed back pressure is 106.6mmHg (abs) under VWO 3% MU, while according to Annexure-IV.3.4, it is 196mmHg (abs), at 38 oC ambient temperature. The required ACC heat exchanging area for 106.6mmHg (abs) is almost 2 times of it for 196mmHg (abs) under for the same ambient temperature and the auxiliary power consumption will be much more than 5800 kW. Please specify the design temperature, guaranteed back pressure and guaranteed auxiliary power consumption.	Design temperature is 38 deg C. Guaranteed back pressure shall be as per clause IV.3.1 of specification HE 57067 Page 19. Guaranteed power consumption shall be as per clause III.1.2 a ii) of spec HE 57067 Page 10 with parameters specified in Annexure-IV.3-4.
9	page 19 of HE57067		According to page 19 of HE57067, ACC shall be designed for wind velocity of 5m/s at any direction, while the annual mean wind velocity is 7.2 m/s specified in Annexure-II-1, please specify the exact design wind velocity.	Design wind velocity shall be as per clause IV.3.6 of specification HE 57067 Page 19.
10			For these 3 complete ACC systems will be designed, manufactured, and supplied by	Bidder to comply the specification.

			China's companies, we request all the material, design, inspection, performance and type test standards to be Chinese.	
11	page 16 of HE57067		According to page 16 of HE57067, the condensate extraction pumps, recirculation valve and piping are not included in the scope of supply of bidder, while the motors and all necessities shall be provided, please specify the exact supply scope of bidder, and the supplier of power cable of the motors.	CEP alongwith its motor and accessories is not in Bidder's scope. Scope shall be as per BHEL specification.
12			Please supply the physical properties of geotechnical experimental data and nominal value of bearing capacity of each soil layer. We request BHEL to supply the design and erection of below ground earthing network.	Geotechnical data shall be as per Annexure-VII-2. Bidder to comply the specification. Ground earthing is not in Bidder scope. This activity will be done during detailed engineering.
13			We request BHEL to supply the special equipment, such as elevators both for passengers and erection of ACC.	Bidder to comply the specification.
14			We request the sub-venders of general Electrical, C&I	Bidder to comply the specification.

			equipments to be well-known manufacturers.	
15			We request BHEL to supply the supply, erection and commissioning of Air Conditioning and Ventilation systems.	Bidder to comply the specification.
16			We request Bidder to supply the design scope of Electrical, Control & Instruments, BHEL to purchase the same.	Bidder to comply the specification.
17			We request the supply scope of steam duct, piping works for condensate, cable bridge to be limited in 1 meter out of the ACC foot print, illumination system and cable limited in ACC foot print to be supplied by bidder.	Bidder to comply the specification.
18			Please specify the supplier (Bidder of BHEL) of frequency converter (including PC, MCC), we request BHEL to supply the transformer of power supplied to ACC systems.	The scope of Bidder (ACC manufacturer) and BHEL for Electrical items shall be as per Annexure-V.1-1. Bidder to comply the same.
19			Please specify the available water quantity, water analysis data sheet, price of water, power, and coal.	Erection is in BHEL scope under ACC supplier supervision. Bidder's query is not clear.

20	Clause no. IV.4.5.1.9 of HE 57067		According to Annexure-IV.9-1 Table 75-IV.4.5.1.9 we would like to know motor whether using variable or dual-number? According to India climate and site condition we suggest using <u>dual-number</u> motor, Bidder's project using dual-number ,please confirm and give us feedback.	BHEL specification clause no. IV.4.5.1.9 and SI No. 75 of Annexure IV-.9-1 is clear. Bidder to comply specification.
21			Lubricating oil or first time oiling of <u>reduction gear</u> whether provided by Bidder, reduction gear whether using inverter(holdback),please confirm and reply to me quickly I am looking forward to your quick reply	Bidder understanding for lubricating oil is correct. Gear box shall be provided with fan reverse rotation backstop(inverter (holdback)) (refer clause IV.4.5.2.16) applicability shall be as per motor control.
22			Why the power consumption is not compared for design case?	BHEL specifications are clear in this regard. Bidder to offer as per specification requirement.
23			Could we use Indian manufactures for fans/motors/gear boxes who are approved by NTPC? Will BHEL accept them?	Bidder had proposed the sub vendors which were taken by BHEL for approval with NTPC. For any additional sub vendor Bidder to propose sub vendor inline with BHEL specification document no. HXE/SK/10829/3 rev02.
24			Could we use 50 kw/220 kw motors in low voltage system (400/415 volts)?	BHEL specification is clear in this regard. Bidder to refer clause 10.04.00 at page 8 of Annexure-V.1-4.
25			Can the steel structure and ducting be removed from the scope of ACC supplier. Of	BHEL specification and scope is clear in this regard. Bidder to comply the specification.

			course design and engineering will be of ACC supplier responsibility.	
26			Annexure – A is missing in Mentioned document ANNEXURE-V 1-1 (Page No 2 of 2)	Annexure-A referred in Annexure-V-1-1 is available as separate Annexure-V.1-27. Bidder to refer the same.
27			Annexure – VII 8 is missing in document HE57067 (Clause No VII.15 Page No 102 of 122)	Annexure-VII-8 is redundant & not required. Bidder to refer clause IX.2 and Annexure-X-1.