

AMENDMENT-1
To Doc. No. PY51350 (Technical Specification for Emergency DG Sets)

Date: 27.07.2018

Customer : Project Engineering & System Division (PE&SD), BHEL-HYDERABAD
Project : Captive Power Plant (CPP) Package, Visakh Refinery Modernization Project
Item Indented : DG SET
Reference : BHEL Enquiry No. T7E1R16080 _ NIT_39625

With reference to the BHEL's specifications & documents furnished vide original enquiry referred above, bidder shall comply with the below requirements also.

S. No.	Reference in BHEL's enquiry document [Doc. No. PY51350]	Requirement specified in BHEL's enquiry documents	Revised Requirement / Clarification	Remarks
1.	Cl. No. 4.8.0	<u>Noise Attenuation System:</u> In order to meet CPCB norms for Noise Level, Bidder to consider Noise attenuation system for the DG Hall in their scope of Supply. Noise attenuation system means complete engineering, Supply of Material (Such as Panels, Fixing accessories, Support Structural etc.).	<u>Noise Attenuation System:</u> As civil construction of DG Hall is in BHEL scope, Noise attenuation system is removed from Bidder's scope. However, necessary assistance with respect to engineering and procurement to be provided by bidder during detail engg. stage.	Clarification
2.	Cl. No. 5.0.0(Sl. No. 4b)	<u>Capacity of DG Set:</u> The gross power of Each DG set is 6750 KVA @pf 0.8.	<u>Capacity of DG Set:</u> Rating mentioned in the specification is the Gross power output of each DG set. While selecting suitable model of DG set, Bidder to ensure a minimum net power output of 5.2 MW is available for customer loads after derating at site conditions and auxiliary load consumption. Bidder shall also indicate the guaranteed auxiliary power consumption of each DG set. <u>The above-mentioned capacity is prime power rating.</u>	Clarification

3.	Annexure-1D	<u>Fuel System P&ID :</u> Scope of Supply for Fuel Supply System is indicated.	<u>Fuel System P&ID:</u> Bidder to consider revised fuel system P&ID for scope of supply. The Level instruments (By Bidder) indicated in the P&ID are for the purpose of level control by BHEL. Any other instruments (Level Instruments, PG, TG etc.) required for operation of DG Set to be considered additionally by bidder in their scope of supply.	Clarification
4.	Annexure-1A	<u>Scope Matrix:</u> Bidder to supply materials as per Scope matrix (Annexure-1A) of BHEL tender Specification.	<u>Scope Matrix:</u> Bidder to supply materials as per Scope matrix (Annexure-1A) of BHEL tender Specification. However, A) If any of items indicated/specified in Scope Matrix with designated name are not applicable, bidder to offer alternative item serving the same function as per equipment's design and indicate below the item being replaced. B) If bidder is not able to meet the above due to specific design of OEM, then bidder may mention "Not Applicable". However, if found applicable during detailed engg. stage or alternative item as per equipment design can serve the same function, bidder to supply the specified quantity without any delivery and commercial implications to BHEL.	Clarification
5.	Cl. No. 4.17.0	<u>Noise Level:</u> Equipment shall be designed in such a way that Noise level shall not exceed values as per CPCB Norms.	<u>Noise Level :</u> Noise attenuation system is in BHEL scope. However, the noise generated by the machine shall be limited as per applicable standard.	Clarification
6.	Cl. No. 6.0.0	<u>2 Year Recommended Spare:</u> Bidder to furnish list of items applicable for 2 Year recommended Spare & prices of the same shall be quoted as an optional items of price bid format.	<u>2 Year Recommended Spare:</u> Bidder to furnish list of items applicable for 2 Year recommended Spare considering 8000 hrs of operation per year & prices of the same shall be quoted as an optional items of price bid format.	Clarification

7.	Cl. No. 6.0.0	<u>Painting :</u> Painting of DG Set shall be epoxy. Final Shade of Generator shall be RAL7032. For further details on Painting, Please refer EIL Spec for painting (Doc. No. 6-79-0020Rev.0) [Annexure-11 of BHEL tender Specification].	<u>Painting :</u> Painting & Paint Shade for Engine & Alternator as per OEM standard is acceptable if the same had been accepted by EIL for earlier executed order. However for other items such as DG set Auxiliaries /Accessories, Chimneys, Piping etc. shall be as per EIL Spec for painting (Doc. No. 6-79-0020Rev.0) [Annexure-11 of BHEL tender Specification]. Painting requirement being minor in nature, shall be reviewed during post order stage.	Clarification
8.	Annexure-1C	<u>Layout:</u> Bidder to accommodate 2 Nos. of DG set along with its auxiliaries/accessories in designated area as mentioned in Annexure-1C of BHEL tender specification.	<u>Layout :</u> Bidder to accommodate 2 Nos. of DG set along with its auxiliaries/accessories in designated area as mentioned in Annexure-1C of BHEL tender specification. The practical difficulties if any shall be reviewed during post order stage.	Clarification
9.	Cl. No. 4.0.0	<u>Technical requirement of Pipe & Fittings:</u> No such technical requirement mentioned in specification.	<u>Technical requirement of Pipe & Fittings:</u> Piping Material Specification (PMS) is enclosed with this document. Bidder to consider the same while designing system.	Clarification
10.	Cl. No. 4.23.0	<u>Complete Unit Test:</u> Complete unit test is to be included in Bidder's scope of supply. All machinery equipment shall be unitized with respective drivers at the manufacturer's works before dispatch to check fit-up of equipment, alignment, location of bolt holes, interface locations / dimensions etc. Unitization shall be carried out at GEG/DG authorized packager works or Engine Manufacturer works.	<u>Complete Unit Test:</u> Complete unit test is to be included in Bidder's scope of supply as followed for Earlier executed EIL Projects. All machinery equipment shall be unitized with respective drivers at the manufacturer's works before dispatch to check fit-up of equipment, alignment, location of bolt holes, interface locations / dimensions etc. Unitization shall be carried out at DG authorized packager works or Engine Manufacturer works.	Clarification
11.	Annexure-11	<u>Technical Specification of LT motor:</u> No such specification of LT Motor is attached in specification.	<u>Technical Specification of LT motor:</u> EIL specification of LT Motor is attached herewith this document.	Clarification

12.	Cl. No. 4.28.0	<u>Special Tools & Tackles :</u> Bidder to consider 2 Sets of Special Tools & tackles_(1 Set for Each DG set) for each DG Set as per OEM recommendation.	<u>Special Tools & Tackles :</u> Requirement being at Customer End, Bidder to consider 2 Sets of Special Tools & tackles_(1 Set for Each DG set) for each DG Set as per OEM recommendation.	Clarification
13.	Cl. No. 10.0.0	<u>Packing & Forwarding:</u> The equipment shall be protected for a storage of 12 months at site. If any extra precaution is to be taken by the purchaser for storage beyond 12 months, the same shall be explicitly indicated in the O&M manual.	<u>Packing & Forwarding:</u> As per Cl. No. 4.2.4 of EIL Specification for Diesel Engine & DG Set, The equipment shall be protected for a storage of 12 months at site. If any extra precaution is to be taken by the purchaser for storage beyond 12 months, the same shall be explicitly indicated in the O&M manual. Accordingly bidder to take care of the same.	Clarification
14.	Cl. No. 4.2.0	<u>Engine Speed:</u> The engine rated speed shall be 1000 rpm (direct through flexible coupling) or lower.	<u>Engine Speed:</u> As per HPCL/EIL requirement, The engine rated speed shall be 1000 rpm (direct through flexible coupling) or lower. Accordingly, bidder to select DG Set.	Clarification
15.	Cl. No. 4.2.0	<u>Type of Engine:</u> Engine shall be four stroke water cooled, Naturally aspirated/turbo charged with charge air cooler, spark ignited type and shall run on diesel.	<u>Type of Engine:</u> Engine shall be four stroke water cooled, Naturally aspirated/turbo charged with charge air cooler, CI type and shall run on diesel.	Clarification
16.	Cl. No. 4.6.0(Sl. No. xi)	The ventilation fans and exhaust fans (if any) shall also start simultaneously as soon as the DG set gets start command.	The ventilation fans and exhaust fans (if any) shall also start simultaneously as soon as the DG set gets start command. Bidder to take care of provisions in bidder supplied MCC. Being minor in nature, further details shall be discussed during detail engg.	Clarification
17.	Cl. No. 8.3.0(Sl. No. b)	<u>Transient voltage performance:</u> Transient voltage performance with job AVR and shop driver by 100% load application at 0.2 pf to be carried.	<u>Transient voltage performance:</u> Transient voltage performance with job AVR and shop driver by 100% load application at 0.2 pf to be carried. In case of any specific practical difficulty, the same shall be reviewed during detail engg. inline with earlier EIL projects.	Clarification

18.	Cl. No. 4.14.0	<u>Location of Day Tank :</u> The day tank shall be located outside the room or above engine fuel connection.	<u>Location of Day Tank :</u> The day tank shall be located outside the room or above engine fuel connection. The day tank cannot be installed above DG Hall Building. As mentioned in BHEL tender specification, for locating the fuel day tank at an elevation, required structural material along with all the fixing accessories is in bidder' scope of supply.	Clarification
19.	Cl. No. 8.2.0 & 8.3.0	<u>Testing & Inspection of Diesel Engine, Alternator & DG set:</u> Testing & Inspection of Diesel Engine, Alternator & DG set shall be carried out as per Cl. No. 8.3.0 of BHEL Tender specification.	<u>Testing & Inspection of Diesel Engine, Alternator & DG set:</u> Testing & inspection of Diesel Engine, Alternator & DG set shall be carried out as per Cl. No. 8.2.0 & 8.3.0 of BHEL Tender specification & the final testing of Diesel Engine, Alternator & DG set individually will be witnessed by EIL/HPCL. Bidder to appoint TPI on behalf of BHEL for inspection. In case of any practical difficulties, the QAP shall be reviewed inline with earlier executed projects of EIL	Clarification
20.	Cl. No. 8.0.0	<u>Inspection requirement of Various Auxiliaries /Accessories:</u> There is no such requirement mentioned in technical spec.	<u>Inspection requirement of Various Auxiliaries /Accessories:</u> <u>For Imported Items:</u> Inspection of Various Auxiliaries /Accessories shall be done by bidder's own inspection agency. No inspection shall be done by BHEL/EIL/ HPCL/ TPI. However, Bidder to furnish test certificate for BHEL/EIL/ HPCL/ TPI review. <u>For Indigenous Items:</u> Inspection of Various Auxiliaries /Accessories shall be carried out by BHEL/EIL/ HPCL/ TPI.	Clarification
21.	Cl. No. 10.1.0	<u>Packing for Imported Items:</u> Packing for imported items shall be as per Sea Worthy Spec (Annexure-12) of BHEL tender Specification.	<u>Packing for Imported Items:</u> Packing for imported items shall be OEM Standard practice. However, same shall be similar/superior to sea worthy packing.	Clarification
22.	Annexure-11	<u>Inline Vibration Monitoring System:</u> Inline vibration monitoring system to be provided for DG set.	<u>Inline Vibration Monitoring System:</u> Inline vibration monitoring system is not applicable.	Clarification

23.	Annexure-8	<u>Sub Vendor for Diesel Engine & DG set:</u> Sub vendor for diesel engine & DG Set to be followed.	<u>Sub Vendor for Diesel Engine & DG set:</u> Bidder to ignore the Sub vendor for diesel engine & DG Set provided in Sub vendor list (Annexure-8) of BHEL tender specification.	Clarification
24.	Annexure-8	<u>Sub Vendor for PLC:</u> Sub vendor for PLC to be followed.	<u>Sub Vendor for PLC:</u> As a philosophy, sub vendor list provided in tender specification to be followed. However, In case of any specific practical difficulty, the same shall be reviewed during detail engg. inline with earlier EIL projects.	Clarification
25.	Additional	<u>Requirement of Control Panel/PLC:</u> No such requirement mentioned in BHEL Tender Specification.	<u>Requirement of Control Panel/PLC:</u> As a philosophy, Control Panel shall be as per tender specification. Further Redundant processor, Redundant I/O & Redundant Power Supply, Redundant Communication shall be provided. In case of any specific practical difficulty, the same shall be reviewed during detail engg. inline with earlier EIL projects.	Amendment
26.	Cl. No. 4.30.0	<u>Software :</u> Bidder to consider software for PLC, if applicable for any of the equipment, in their scope of supply and provide soft copy/hard copy of the logics so that same can be loaded by customer at a later date if required.	<u>Software :</u> Bidder to provide system Software/License inline with Cl. No. 4.17 of Standard Specification for instrumentation of Packaged Unit (Doc. No. 6-52-0052Rev. 03) (Annexure-11 of BHEL tender Specification). In case of any specific practical difficulty, the same shall be reviewed during detail engg. inline with earlier EIL projects.	Clarification
27.	Cl. No. 4.14.0	<u>Fuel Float Tank:</u> In case, Fuel day tank is mounted above engine fuel connection level, a fuel float (surge) tank shall be provided along with its interconnecting piping/hoses to ensure that the system not permit gravity flow to the engine through fuel supply line during engine shutdown.	<u>Fuel Float Tank:</u> In case, Fuel day tank is mounted above engine fuel connection level, other items which serve the same purpose as fuel float (surge) tank, shall be provided along with its interconnecting piping/hoses to ensure that the system not permit gravity flow to the engine through fuel supply line during engine shutdown. However the same configuration should have been supplied	Clarification

			For earlier executed project. Bidder to provide reference during detail engg. stage.	
28.	Annexure-11	<u>Various EIL Specification:</u> EIL specification as attached as Annexure-11 of BHEL tender Specification shall be followed.	<u>Various EIL Specification:</u> Bidder to follow various EIL specification for the Individual equipment attached with BHEL tender Specification Any of the requirement of BHEL/EIL tender specification, which are practically impossible to meet, shall be reviewed during detail engg. inline with earlier EIL projects.	Clarification
29.	Cl. No. 4.1.0	<u>Code & Standard:</u> Code & Standard as mentioned in Cl. No.4.1.0 to be followed for Design of DG set and its various auxiliaries.	<u>Code & Standard:</u> Code & Standard (As Applicable) as mentioned in Cl. No.4.1.0 to be followed for Design of DG set and its various auxiliaries.	Clarification
30.	Cl. No. 4.4.0	<u>NGR Capacity:</u> NGR rating shall be 600A, 10Sec.	<u>NGR Capacity:</u> Bidder shall comply the specification requirement.	Clarification
31.	Cl. No. 4.8.0	<u>415V DG Auxiliary MCC:</u> A common 415V DG Auxiliary MCC shall be provided for DG Auxiliaries	<u>415V DG Auxiliary MCC:</u> Bidder shall comply the specification requirement.	Clarification
32.	Cl. No. 4.21.0	There shall be hardwired & soft communication between above DG control panel & DCS system.	There shall be hardwired & soft communication between above DG control panel & DCS system Cables & its accessories required for connection is in customer scope.	Clarification
33.	Annexure 1A B.3	<u>Scope of Matrix:</u> PLC Panel for DG auxiliaries (Located along with Generator Control Panel)-2 Nos. to be provided.	<u>PLC Panel for DG Auxiliaries:</u> Bidder shall comply the specification requirement.	Clarification
34.	Annexure 1A B.6	<u>Air termination rods for lightning protection system :</u> Air termination rods for lightning protection system to be provided by bidder.	<u>Air termination rods for lightning protection system :</u> Air termination rods for lightning protection system to be provided by bidder for chimney.	Amendment
35.	Annexure 1A B.7	<u>Aviation lamps for DG Hall :</u> Aviation lamps for DG Hall to be provided by bidder.	<u>Aviation lamps:</u> Since DG Hall Civil Building is in BHEL scope, Air termination rods for DG Hall is excluded from Bidder's scope of supply.	Clarification

36.	Annexure-8	<u>Sub Vendor List:</u> Bidder to follow sub vendor list as per Annexure-8.	<u>Sub Vendor List:</u> As a philosophy, sub vendor list(Annexure-8) provided in tender specification to be followed. However,In case of any specific practical difficulty, the same shall be reviewed during detail engg. inline with earlier EIL projects.	Clarification
37.	Additional	<u>Fuel Oil Specification:</u> No such details provided in BHEL tender Specification.	<u>Fuel Oil Specification:</u> Fuel Oil details is attached with this document.	Clarification
38.	Cl. No. 3.1	<u>Site Data:</u> Site data is given in Cl. No. 3.1 of BHEL tender Specification.	<u>Site Data:</u> The site data mentioned is the only data available with us. Bidder to proceed inline site data/metrological data. Based on the same, Bidder to design their system as per earlier executed project of EIL.	Clarification
39.	Annexure-1A	<u>Scope of Supply:</u> Foundation bolts, fixing bolts, Check, Wedges, Sole Plates Exhaust stack foundation bolts etc. will be in Bidder scope.	<u>Scope of Supply:</u> Since overall engineering of DG Set & Its various Auxiliaries/Accessories is in Bidder's Scope, required Foundation bolts, fixing bolts, Check, Wedges, Sole Plates Exhaust stack foundation bolts etc. will be in Bidder scope.	Clarification
40.	Cl. 7.0.0	<u>PQC Requirement (Equipment Qualification Criteria):</u> Bidder to follow PQC Requirement as per BHEL tender Specification.	<u>PQC Requirement (Equipment Qualification Criteria):</u> Requirement being at HPCL/EIL end, Bidder to follow PQC requirement as mentioned BHEL tender Specification only.	Clarification

Enclosure:

- Annexure-1D:Fuel System P&ID
- Annexure-11:EIL LT Motor Specification
- Annexure-1:Piping & Valve Material Specification
- Fuel Oil Analuysis

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