THE PROVISION

INVITATION TO TENDER (ITT) FOR REPLACEMENT OF DIESEL GENERATORS AT DUVHA POWER STATION

TENDER NUMBER: E1397GXMPDUV

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
1.				Clarification	C&I: System Integration: Will it be required to integrate the new Diesel Generator C&I interface with the existing Duvha plant control system (DCS). If this must be done, please advise who the Control System Integrator at Duvha is at the moment.	1. YES, C&I integration is part of the scope of work to be done by the contractor. refer section 5.2 of the Duvha PS diesel generator replacement – employer's requirements scope of works report for details. 2. SIEMENS
3.				Clarification	C&I: Will the new Generator Control Panel communicate the signals received from hard wired I/O via network communication to the Duvha Control System (DCS)? The document states hardwired to the Generator Board. The clarification is specifically aimed at the acceptable communication to the DCS.	REFER TO SECTION 5.2.3 of the Duvha PS diesel generator replacement – employer's requirements scope of works report. (Figure 2: PLC link block diagram) of the above section specify the route
4.				Clarification	C&I: Please confirm the existing Network Communication Protocol (Modbus, Profibus, Ethernet)	IEC61850 (ETHERNET BASED PROTOCOL) Refer To Section 5.2.3 Of The Duvha Ps Diesel Generator Replacement – Employer's Requirements Scope Of Works Report
5.				Clarification	Elec: What is Eskom's preference for Generator Battery Starter: Nicad or Lead Acid? Standard 240-6772907 states it should be Nicad. Please confirm.	NICAD, Batteries accepted No Lead Acid batteries
6.				Clarification	Elec: The Tenderer requires a Single Line Diagram and Schematic drawings for	The New Deisel Gen Should Come With its Own Alternator Including the Control Panel.

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
					the Generator Control Panel. This information will assist with site compliance and interfacing to the existing system.	Control Panel Need to Be Replaced Not the Board (See Attached Single Line Reticulation Drawing)
7.				Clarification	Elec: Tenderer requires load list including startup sequence, load build-up (step loads) and duty factor. The standard specifies a maximum step load of 50%. Please confirm.	Confirmed
8.				Clarification	Elec: Earthing point connections. Please confirm if existing earthing integrity must be verified.	YES
9.				Clarification	Mech: Does the new Generator need its own, integral diesel day-tank (if applicable size? hours run?).	Refer to section 5.2.8 of the Duvha Ps Diesel Generator Replacement – Employer's Requirements Scope of Works Report
10.				Clarification	Rigging: Are there any crawl beams available inside the plant room? Can the building roof be removed?	• No Roof Removal. • Beam Not Available. Supplier to provide the required equipment acceptable
11.				Clarification	PM: Who will be responsible for the Change Management Process (Client/Contractor)? Clarify specific responsibilities.	Contractor to submit the required design and Eskom team to submit to the committee with the support of the contractor.
12.				Clarification	Elec: Sync over multiple ACB's: The Eskom standard allows synchronization only over one ACB. This could cause a problem when power returns while on Gen supply to sync across Main Brd Fdr ACB and Gen Brd ACB. If this is the case, another Gen controller is required for the upstream ACB. SLD will assist with information.	Confirm that we synchronies only over one ACB

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
					Assumption at this stage is to provide sync only over one ACB.	
13.				Clarification	Exhaust and silencer allowable noise level? Eskom Standard 240-62772907 states: The maximum noise level shall be 90 dBA at 1 meter away from the DG set. Please confirm. This is assumed as being outside the building. Inside the DG Room personnel will require hearing protection (HPE).	YES <85DB
14.				Clarification	Protection required? Standard (ANSI: 27-Undervoltage, 27PS-Undervoltage for Power Source Sync, 59-Overvoltage, 81U/O Under/Over Frequency, 32-Power Direction, 32R-Reverse Power, 40-Loss of Excitation, 50, 51, 50N/G, 51N/G) if ACB at Generator Board.	The ones stipulated in the standard are required,
15.				Clarification	Does Eskom have a preferred Lifting and Rigging vendor which has knowledge of site conditions.	No
16.				Clarification	Does Eskom have a preferred scaffolding vendor which has knowledge of site conditions.	No, however, there is an existing service provider on site that the supplier can approach for quotation.
17.	TECHNICAL-DUVHAP_2	2.2.1	5	Normative References	Please provide the applicable revision of the following standard (note that revision 2 is referenced in the Works Information (Tech Spec 2.2.1), however the Tenderer believes that a later revision is available). 240-62772907	Specification for Diesel Generator Systems: 240-62772907, See attached latest Rev 3.
18.	TECHNICAL-DUVHAP_2	2.2.1	5	Normative References	The following document is referenced in the technical Specification under 2.2.1 Normative references: Electrical Plant-Unit 380V standby supplies – system description and operations: E1008	See attached : Electrical Plant-Unit 380v standby supplies – system description and operations: e1008

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
					Please provide this document. Also not included in previous tender.	
19.	Previous Tender			Starting System	It was mentioned in the previous tender clarifications that Eskom prefers a battery based starting system for the new Diesel Generator. Please confirm if this is still the preferred option.	Yes, Battery Starting Preferred.
20.	Previous Tender			Cooling System	It was mentioned in the previous tender clarifications that Eskom prefers an air-cooled diesel generator. Please confirm if this is still the preferred option or if an alternative should be submitted with the tender where water cooling is used as per the existing units.	Yes, Air-Cooling is preferred.
21.	TECHNICAL-DUVHAP_2	5.2.12	26	RAM Study	Please define the boundaries / battery limits of the RAM study to be conducted? The Tender needs to know which part of the system will be included in the RAM study (e.g. HVAC, Existing LV Boards etc.) A mark-up of a single line diagram and P&ID showing the RAM study boundaries would be appreciated.	The reliability of the system and the individual sub-systems shall be equal to or greater than 98.88%. Supplier to give details based on their design. Refer 5.2.12 of the Duvha PS Diesel Generator replacement – employer's requirements scope of works report
22.	TECHNICAL-DUVHAP_2			HAZOP and FMECA	Must the Tenderer allow for a HAZOP and FMECA study of the new installation?	Yes Refer 5.2.13 of the Duvha PS Diesel Generator replacement – employer's requirements scope of works report
23.	TECHNICAL-DUVHAP_2	2.5	7	Decommissioning	Section 2.5 of the Works Information states the following: "Decommission and removal of damaged Diesel Generators and preserved for spare items." It was mentioned in the previous Virtual Clarification meeting that the existing Diesel Generators are to be removed and placed in an area within the Duvha site boundaries for scrapping. Please	Preserved. Don't damage, remove orderly items to be used for spares.

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
					confirm if the existing diesel generators can be partially disassembled while removing or does it have to be preserved (i.e. minimize dismantling and damage during removal)?	
24.	TECHNICAL-DUVHAP_2	5.2.1.1	13	Diesel Generator Panel Requirements	Section 5.2.1.1 states the following: "The Contractor shall decommission and replace the existing 380V Diesel Generator Control Panels for **U5, U4 and U3**." Please confirm for which Units the Control Panels need to be replaced (should there not be 5 Units?)	It's an error. The tender is for 5 (five) Diesel Generator Panels for Unit 1,2,4,5&6 (scope of work will be revised and re-uploaded)
25.	TECHNICAL-DUVHAP_2	5.2.7	19	Ventilation Requirements	Please provide a copy of the applicable revision of standard 240-70164623.	See attached Eskom heating ventilation and air conditioning (HVAC) design guideline: 240-70164623
26.	TECHNICAL-DUVHAP_2	5.2.7	19	Ventilation Requirements	If the HVAC system is to be modified, must the design be signed off by an ECSA registered engineer?	Yes
27.	TECHNICAL-DUVHAP_2	5.2.11	24	Civil Requirements	Must the structural assessment and design of any structural components be performed and signed off by an ECSA registered structural engineer?	Yes The structural assessment and design must be sign off by the contractors ECSA Registers Civil Engineer, then submitted to Eskom for review
28.	TECHNICAL-DUVHAP_2	5.2.13	26	Hazardous Area Classification / HAZLOC	Confirm if any areas <u>inside</u> the existing diesel generator room is currently zoned.	This has been stipulated on refer 5.2.13 of the Duvha PS Diesel Generator replacement – employer's requirements scope of works report
29.	TECHNICAL-DUVHAP_2	5.2.13	26	Hazardous Area Classification	Confirm if the existing Diesel Generators are ATEX rated and if the new Diesel Generators need to be ATEX rated.	Yes
30.	TECHNICAL-DUVHAP_2	5.5	28	Drawings	Please provide a copy of the following drawings: 0.57/13654 Rev 2 sheet 1 (3) Diesel Generator Control Panel General Arrangement	See attached

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
					0.57/13640 Rev 3 Schematic diagram of fire control systems and associated services 0.57/1035 Rev 20 Duvha Power Station layout 24.57/46865 Rev 0 sheet 2 U4 fire protection diesel generator and generator transformers	
31.	TECHNICAL-TENDER_1	3.3	6	Table 2 No. 2 ISO 3834 Part 2 Mandatory Req	Mandatory requirement for ISO 3834 Part 2 accreditation. The Tenderer would like to clarify what part of the scope of work needs ISO 3834 Part 2 accreditation. ISO 3834 Part 2 is a welding standard and are normally applied on critical welding performed on site. 1. The Diesel Generator OEMs utilizes numerous sub-contractors and sub-suppliers for the manufacture and supply of components that form part of the diesel generator assemblies. Some of these parts include welding (e.g. baseplate frame, cooling water piping, cooling water radiator, cooling water expansion tank etc.). The welding might be performed by a sub-contractor or sub-supplier to the OEM. Compliance to ISO 3834 Part 2 by all parties that performs welding is therefore extremely challenging. The Tenderer would like to suggest that Eskom considers imposing ISO 9001 accreditation onto the Diesel Generator OEM rather than ISO 3834 Part accreditation. ISO 9001 accreditation will assure that the OEM and its sub-contractors and suppliers have adequate quality	The Mandatory requirement for ISO 3834 Part 2 Accreditation remains and it's applicable for this works. In case where the service provider will not perform assembly on site, but do it via OEM, the OEM certificate can be provided.

No.	Document	Section	Page	Requirement	Clarification Questions	Client Response
					systems in place. 2. The welding required to be performed on site is limited to the small-bore diesel supply and return lines to each generator. These lines operate at very low pressure (close to atmospheric pressure) and at ambient temperature. It is proposed that Eskom relaxes the requirement for ISO 3834 Part 2 compliance for the site welding to be performed on the small bore diesel supply and return lines. It is proposed that 100% X ray or MPI are performed on all the diesel pipe welds as a substitute to ISO 3834 Part 2 certification.	
32.	TECHNICAL-DUVHAP_2	5.2.11	24	Civil Requirements	Eskom refers to a "Consultant" in section 5.2.11 of the specification. Please confirm the definition of the "Consultant". Can it be assumed that the "Consultant" refers to the "Contractor"	Yes. Both consultant work and construction work will be done by the contractor. Therefore, the contractor will be responsible for the consulted work stipulated in the tech spec (structural assessment and design work)
33.	NEC for Duvha PS Diesel Generator Replacement	C1.2b and C1.3	2	Missing Documentation	Reference is made to Documents C1.2b and C1.3. The Tenderer notes that these documents were not included in the NEC documentation issued with the enquiry. Kindly provide the referenced documents.	See attached revised NEC which include C1.2b and C1.3