

A. Queries on Technical Specification of DG sets

SI No.	Clause of Specifications	As per Contract Document	Clarification Sought	PHPA-II Clarification
1	1.25	Make of equipment/fixtures	In 1250kVA we are offering below brands: DG set manufacturer(OEM): Supernova Engineers Ltd Engine brand: Perkins Alternator brand: TDPS	Shall be as per Technical Specification (TS).
			In 250kVA we are offering below brands: DG set manufacturer(OEM): Supernova Engineers Ltd Engine brand: Mahindra(mPower) Alternator brand: Leroy Somer	
			In 100kVA we are offering below brands: DG set manufacturer(OEM): Supernova Engineers Ltd Engine brand: Volvo Eicher(VECV Commercial Vehicle) Alternator brand: Leroy Somer	
2	1.4.1 & 2.4.2.2	Design ambient temperature	There is contradiction in Design ambient temperature - in Clause No - 1.4.1 it is mentioned as 40 Deg C however the same is mentioned as 50 Deg C in Clause No - 2.4.2.2 of technical specifications. Please confirm, what design temp. need to be considered	Consider Ambient Temperature as 40°C.
3	2.1	Scope	A. In 1250kVA DG set, NGR panel is in Whose scope? B. In 1250kVA DG set, VCB panel is in Whose scope? C. In 1250kVA DG set, Bus PT is in whose scope? D. In 250kVA DG set changeover panel is in whose scope?	Shall be as per Technical Specification (TS).



		e) One 990 litres daily service fuel tank each for 1250 kVA capacity DG-sets, One 500 litres daily service fuel tank for 250 kVA capacity DG-set and One 285 litres daily service fuel tanks each for 100 kVA capacity DG-sets, f) Five (5) nos. lubrication oil drums for storage of 400 litres oil along with manual pumps for 1250 kVA DG Set, for 250 kVA DG set and for 100 kVA DG sets.	E. In 100kVA DG set changeover panel is in whose scope?	
4	2.1.1 e) & f)		A). As per manufacture standard we have considered 990 liter fuel tank for 1250 KVA, 450 liter fuel tank for 250 KVA and 290 liter fuel tank for 100 KVA DG set. B). In Clause – 2.1.1 – e & 2.1.1 – f, it is mentioned Five Numbers of Air Intake and Exhaust System along with 5 Nos. Lubricating oil tank in the scope of supply. We understand that the above is one no for each DG set and total 5nos. for 5 nos. DG sets - Kindly confirm our understanding is correct	A. For 1250 kVA - 990 ltrs, for 250 kVA - 450 ltrs & for 100 kVA - 290 ltrs fuel tank. B. Air intake & Exhaust system: 1 no. each.
5	2.1 i)	Special tools and plants	No special tools and tackles are required for normal operation/maintenance. However we have considered general tools.	Standard T&P to be supplied for O&M purpose. A. For 1250 kVA DG (MAT-Portal) - The distance between DG Room and HT/LT room is approximately 150 m. B. For 250 kVA DG (DAM Top) -The distance between DG Room and HT/LT room is approximately 200 m. C. For 100 kVA DG (Desilting Chamber) -The distance between DG Room and HT/LT room is approximately 20 m. D. For 100 kVA DG (BVC) -The distance between DG Room and HT/LT room is approximately 300 m.
6	2.1 o)	1 lkV power cables from 1 lkV VCB metal-clad switchgear panels (containing VCBS) up to 1250 kVA DG sets and 1.1kV power cables from 415 V metal-clad switchgear panels (containing ACBS) up to 250 kVA & 100 kVA DG sets.	Length of the various types of cables are not given in the tender document. Please furnish the same. Please share the length to be used of each type of cable so as to enable us to consider the costing accordingly.	



				Note* 1). Length of Cable may be considered as per distance mentioned above & as per Technical Specification. 2). Completion of required scope of work shall be responsibility of the Contractor. Refer clause 1.1, Scope of Work, ITB.
7	2.2.2.2	The list of relevant standards is given below. The latest version of these standards shall be applicable.	A) All codes and standard shall be as per manufacture standard. B) The engine shall be as per ISO 3046 & BS 5514 and alternator shall be IEC 60034-1	Shall be as per Technical Specification (TS).
8	2.4	Main Features of DG Sets	A. The offered DG sets are prime power rated and it shall be run at 80% average loading. The instant block loading shall be 50% and recovery time shall be 10 sec B. DG set life is totally depended on usage and maintenance and cannot be defined as 15 years or 50000hours of operations. C. You can take data from RS 485 port for SCADA integration. D. The design temperature shall be 40 degree C only. Any changeover is not quoted with DG sets. Auto start facility along with 1 no VCB & 1 no MCCB quoted with DG sets	A. The engine block loading can be considered as 50-60% of rated capacity. B, C & D. Shall be as per Technical Specification (TS).
9	2.4.2		The layout is in PDF and the location is not clear from layout	Clear Drawing is enclosed
10	2.5.1.1	The engine shall be capable of immediate starting and accepting block load of about 100% of rated capacity following the extended inoperative periods.	A) 100% block load is not possible. 50% block load can be offered. The offered engine is prime rated DG set and average loading shall be 80%. B) Engines are with electronic governors with governor class defined by them. Any change in speed is not allowed. Solenoid is	A & G. The engine block loading can be considered as 50-60% of rated capacity. B, D, E & F. Shall be as per Technical Specification (TS).



			as per engine manufacture standards. C) We have quoted the engine as per Indian emission norms and we are not aware of Bhutan pollution norms so we do not quote. D) Any external oil tank is not quoted. Engine comes with its standard sump which will be pre filled from factory. Any further external oil system not quoted. E) Any external fuel system is not quoted as we are not aware about fuel tank location its distance and connection to day tank of DG sets. We have not autoed any external fuel exhaust and its accessories. F) We have quote lead acid batteries. G) As per manufacturer standard offered DG set shall not be suitable to take full load at one step engine block loading shall be 50-60 %.	C. Shall be as per Central Pollution Control Board (CPCB) norms.
11	2.5.1.2 Speed Governor	The diesel engine shall be fitted with a speed governor with automatic and manual adjustment of load limit, speed setting and speed droop.	The electronic governor provided on the engine has built in protection against over-speed. Separate manually adjustable mechanical over speed protection is not required and not covered in our scope.	Shall be as per Technical Specification (TS).
	2.5.1.3 Air Intake Exhaust System	The design of the silencers shall comply the guidelines laid down by Central Pollution Control Board, India and as per relevant rule in Bhutan.	A) Offered equipment comply Indian standard only. B) The DG Sets offered will be as per CPCB norms. However, to operate the DG Sets some approval may be required to be taken from the pollution control department and Electricity department. Please confirm that these approvals will be taken care by you. C) What is distance to be considered to quote fuel pipe & exhaust pipe?	Shall be as per Central Pollution Control Board (CPCB) norms.



13	2.5.1.5 Lubrication System	The fine filter shall be of the simplex type and allow for change of filter elements during operation of the engine	As per manufacture standard there is no provision for online filter change facility.	As per manufacture's standard.
14	2.5.1.4 Cooling System	Cooling system	In technical specifications, cooling system is mentioned as radiator cooling for all the DG Sets. However, in the price schedule Heat Exchanger type cooling system is asked for all the DG Set Ratings. In this regard we wish to inform that Heat Exchanger type cooling system requires addition accessories like Cooling towers, Valves, additional Piping works, etc. and the same is not mentioned in the BOQ. Please confirm what type of cooling system is required to be offered.	Cooling system shall be Radiator Cooling System.
15	2.5.1.5 Lubrication System	Service oil tank, storage oil tank and hand-operated oil pump shall be provided for lubrication system.	We have not considered any additional storage tank for lube oil. The lube oil system provided has a self lubrication priming system. Separate hand priming pump is not required and same is not considered	Shall be as per Technical Specification (TS).
16	2.5.1.8	Pipelines, Valves and Instruments	Please specify required quantity of such items so as to enable us to consider accordingly.	Shall be as per Technical Specification (TS) & manufacturing design
17	2.5.1.13 Engine Warming	The arrangement has to be provided to supply hot water upto a temperature 60° C to 70° C into engine jacket and oil coolers of the engine for keeping it sufficiently warm for the purpose of quick starting of the engine under cold condition.	Not required.	Standards deleted



18	2.5.1.14 Instrument s	At the lube oil outlet from engine to give alarm when the temperature rises above pre-set value and subsequently trip the engine when the safe limit has been exceeded. For this, the bidder shall furnish the details of interlocks.	In PSO 600 controller there is no provision for lube oil temperature indication/trip.	Shall be as per Technical Specification (TS).
19	2.5.1.15	All consumables required at site such as welding rods, grease, oils, fuel, cooling liquid, paints, preservatives etc. plus ten percent(10%) extra shall be supplied.	Please specify required quantity of such items so as to enable us to consider accordingly.	Shall be as per Technical Specification (TS) & ITB Clause 1.1, Scope of Work.
20	2.5.2.1.2.R ating	Insulation class of winding: Class F for stator and rotor	Class F insulation is nowhere manufactured in India for LT machines. Hence we have considered alternator with class H insulation. For HT DG set we have considered insulation class F	Shall be as per Technical Specification (TS).
	2.5.2 Electrical equipment	The connections of the space heaters shall be brought out to a separate terminal box	A) Prime duty alternator offered with overload as confirmed. B) We have not considered synchronization. The efficiently as mentioned in datasheet. C) AVR, stator & rotor design as per manufacture standards not as per specifications. D) Alarms are as applicable in standard system. E) Protection relays can be considered for HT DG set for LT DG sets this relays are not considered. F) Any cabling and earthings not quoted.	Shall be as per Technical Specification (TS).



			G) Lead acid batteries along with SMPS type battery charger offered. H) SFC is as per engine manufacturer standards and not as specified in tender. I) As per manufacturer standard there is no provision of separate terminal Box for space heater wiring, RTD & BTD. As per manufacture standard SMF VRLA type 2 no 12V, 160 AH Cummins Pulsite make battery for 1250 KVA, 2 NO 12V, 95 AH Cummins value plus make battery for 250 KVA and 1 no 12V, 95 AH Cummins value plus make batteries for 100 KVA DG set shall be provided. As per manufacture standard, battery shall be suitable for 6 cranking of DG set	Shall be as per Technical Specification (TS).
22	2.5.2.7 Battery and Charger	Battery and Battery Chargers	With the unit running at no load voltage and speed, the transient voltage drop at its rated terminal shall not exceed 10% of rated voltage on simultaneous starting of all emergency loads. The enclosure will be fabricated from 2mm thick CRCA sheets. The noise level shall be 75 dB or less at 1 metre from acoustic enclosure surface conforming to rules issued by CPCB (Central Pollution Control Board), India and as per relevant rules in Bhutan. The acoustic enclosure	Shall be as per Technical Specification (TS).
23	2.5.3.1 General		As per manufacture standard acoustic enclosure shall be fabricated out of 1.6mm (16 SWG) thick CRCA sheet. As per CPCB norms noise insertion loss shall be 25 dBA at one meter distance form DG set under free field condition.(For 1250 KVA) Acoustic enclosure shall be weather proof type suitable for outdoor application and there is no IP defined for the same.	The Acoustic enclosure can be considered 1.6 mm thick and the noise level can be considered as per CPCB norms

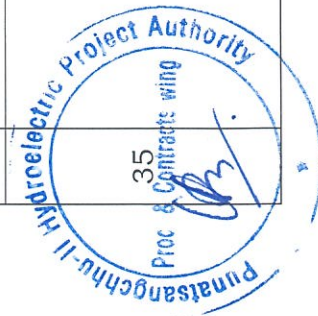


		should be water proof and dust proof conforming to IP-65 Protection.	Material testing cannot be done at works, however we are using reputed make material.	
25	2.8 Shop Tests and Inspections	Materials used for construction of the equipment shall be thoroughly shop-tested and inspected by the bidder at his own expense prior to dispatch.	We shall offer the assembled DG set at our works for load trials for 1 hour before dispatch. Testing beyond the given duration shall be charged extra. The QAP for DG testing shall be submitted after the award of contract. The expenses incurred towards deputing your authorized representative / independent agency including their fees for witnessing the Testing at our works shall be to your account. We have not considered any kind of separate routine/type tests on engine & alternator. However certificates for the same shall be provided after award of Contract. Any individual engine and alternator is not applicable. Complete DG set load trail can be offered as per our standard QAP. Any site test cost not offered. It is to be arranged by buyer	Testing shall be carried out as per Quality Assurance Plan (QAP) and as per relevant standards at factory before the dispatch of material in the presence of Purchaser and Consultant Representative as per clause 1.27.5.1. Certificates of routine test/type tests can be submitted after award of the Work.
26	2.10 Training of Engineers		We would provide training at site for operation / routine maintenance of owner personnel during execution of contract. As per this clause it is understood that we have to provide training. It may kindly be noted that, during commissioning of the DG Sets, training on operation along with basic troubleshooting of the DG Sets will be provided to you. Kindly confirm this is acceptable to you	Shall be as per Technical Specification (TS).



Page 8 of 12

27	4. Automatic Mode	The facility of synchronization will be available in both Auto & Manual mode	As per BOQ only AMF panel is required. We have not considered any sync facility in AMF & control panel.	Shall be as per Technical Specification (TS).
28		Automatically control the start & stop of engines, depending on the predefined load setting in the PLC.	In AMF function PLC is not required and also the same is not part of AMF panel.	Shall be as per Technical Specification (TS).
29	D-20	Smart Metering System required	We have considered Multifunction Meter with RS-485 Port only.	Shall be as per Technical Specification (TS).
30	L-20	Necessary interfacing with RIO/ SCADA	We have considered RS-485 PORT in MFM on panel connection to scada and required wiring shall not be our scope.	Shall be as per Technical Specification (TS).
31		Differential protection required for 250kVA & 100kVA both.	We have not considered the Differential Protection for Both the ratings.	Shall be as per Technical Specification (TS).
32			NIS NGR PANEL NOT REQ. WE HAVE QUOTED OPTIONAL PRICE FOR SAME.	Agreed as per Manufacture's Standard
33		Load	Kindly confirm the user / PHPA shall provide required Diesel and Load for DG sets at site during testing and commissioning at Site.	Shall be as per TS
34		Price Schedule	As the soft copy of the tender documents is not available, kindly confirm if the price schedule can be submitted as a separate excel sheet (prepared by us without changing the format)	Acceptable: Separate sheet but with seal & signature of the Bidder along with sealing & signing of the issued price schedule
35		Deduction towards income tax shall be made from every interim payment certified by Engineer-in-charge in Terms of Bhutan Income Tax Rules as in force from	As per TDS, Kindly confirm that PHPA will provide us the Tax deduction certificate for the same against this clause	TDS Certificate will be issued by PHPA-II



	time to time. 2% Contractors tax in lieu of income tax is presently applicable for Bhutanese contractors and 3% for non-Bhutanese Contractors.		
36	Regarding mode of Payment	Kindly confirm the same can be made through RTGS instead of through Cheque	Mode of Payment: through Cheque/ RTGS/ others. Associated charges shall be borne by the Contractor
37	Line of Credit	Kindly confirm the subject PHPA - II project is a LOC under GOI (Line of Credit) project /funded by Exim Bank	PHPA-II is an Inter-Governmental (IG) project of Government of India & Royal Government of Bhutan.
38		We have gone through the Layouts as shared by you. We couldn't understand and co-relate the rating of the DG Sets required with respect to the locations mentioned in the layout. It would be of great help to us, if you can kindly confirm the DG Set ratings as per the locations mentioned in Layout drawings shared, along with the position of the Panel Room	DG rating Shall be as per Technical Specification (TS) and enclosed Key SLD.

B. Queries on Price Schedule of DG sets

Clause of Specifications	As per Contract Document	Clarification Sought	PHPA-II Clarification
SCHEDULE-B	Mandatory Spares for five years of satisfactory operation for		
a.	For 1250 KVA DG Set		
	Lubricating Oil filter element	We recommend to increase this quantity as this will be sufficient for 1 service for 1 DG set	Shall be as per BoQ
	Bypass filter element	There is no bypass filter element instead we have quoted pre fill insert	
	Coolant additives	This is 50 liters can for Coolant top up. There is no coolant additive	



viii)	Spring and Gasket for X-head valve	This is only 2 Qty	
ix)	Hoses with adaptor	Kindly confirm which type of hoses required.	
xi)	DC starter assembly with clutch engaging & disengaging arrangements complete with motor	Clutch is Not applicable in our system	
xii)	Current transformer	1 qty considered	
xv)	Diode fuses	HT fuse	
xxii)	Coil for contractors (for both power and Auxiliary Contractors)	Power contactor not required	
xxvi)	Ammeter	Analogue type is quoted	
xxvii)	Voltmeter	MFM considered instead of individual meters.	
xxviii)	Frequency meter	MFM considered instead of individual meters.	
xxix)	Motorised potentiometer	Not applicable. Voltage is seatbelt from AVR	
xxx)	Valves	Only 25NB ball valve for fuel & Oil system. Any engine valves not considered	
b.	For 250 KVA DG Set		
vi)	Coolant additives	This is 30 liters can for Coolant top up. There is no coolant additive	
viii)	Spring and Gasket for X-head valve	This is only 2 Qty	
xi)	DC starter assembly with clutch engaging & disengaging arrangements complete with motor	Clutch is Not applicable in our system	
xxii)	Coil for contractors (for both power and Auxiliary Contractors)	Power contactor not required	Shall be as per BoQ
xxvi)	Ammeter	Analogue type is quoted	
xxvii)	Voltmeter	MFM considered instead of individual meters.	
xxviii)	Frequency meter	MFM considered instead of individual meters.	
xxix)	Motorised potentiometer	Not applicable. Voltage is suitable from AVR	
xxx)	Valves	Only 25NB ball valve for fuel & Oil system. Any engine valves not considered	





c. For 100 KVA DG Set		
iv)	Coolant additives	This is 30 liters can for Coolant top up. There is no coolant additive
vi)	Spring and Gasket for X-head valve	This is only 2 Qty
ix)	DC starter assembly with clutch engaging & disengaging arrangements complete with motor	Clutch is Not applicable in our system
xxi)	Coil for contractors (for both power and Auxiliary Contractors)	Power contactor not required
xxv)	Ammeter	Analogue type is quoted
xxvi)	Voltmeter	MFM considered instead of individual meters.
xxvii)	Frequency meter	MFM considered instead of individual meters.
xxviii)	Motorised potentiometer	Not applicable. Voltage is suitable from AVR
xxix)	Valves	Only 25NB ball valve for fuel & Oil system. Any engine valves not considered
		Shall be as per BoQ