

PURCHASE SPECIFICATIONS
FOR
SELF GENERATING MOBILE LIGHTING
TOWER (SGMLT)
FOR
OIL RIG APPLICATIONS



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PART -1 COMMERCIAL AND OTHER GENERAL TERM AND CONDITIONS

Part I covers the commercial and other various terms and conditions applicable for design, manufacture, testing, supply, installation & commissioning at Rig-site of SELF GENERATING MOBILE LIGHTING TOWER & accessories as detailed below:

1. SCOPE OF SUPPLY & SERVICES:

- 1.1 Scope of supply includes “SELF GENERATING MOBILE LIGHTING TOWER” (SGMLT) complete with the Diesel Engine, Alternator, DG set controls, starting batteries and engine driven charging alternator, acoustic enclosure, Diesel Tank, Lube Oil initial fill, Lighting Tower, Luminaries, Lighting Control panel (Console) assembled on trolley with tyres, stayjacks & pulling arrangement /hook, complete in all respect and in ready to use condition, spares and accessories conforming to this BHEL specification No. OR 12488 Rev 00. Installation & commissioning at Rig-site (ref Annx-01) is included in scope of supplier.
- 1.2 The rig for which the above SGMLT’s are envisaged, rig location and rating/ number of equipment for particular rig and proposed schedule of testing & commissioning at Rig-site is furnished in Annexure-I. Ultimate customer for items required against this specification is M/s ONGCL, and therefore referred in to this specification wherever necessary.
- 1.3 The offered equipment shall be in line with BHEL Specification No. OR 12488 Rev 00.
- 1.4 Any other hardware or item not detailed in this specification but necessary for proper functioning of SGMLT at Oil Rig site should be in the supplier’s scope.
- 1.5 Installation & commissioning activities at Rig-site, including-installation supervision, testing, startup checks and load testing of the SGMLT shall be carried out by service engineer of SUPPLIER, as per OEM guidelines. For visit of service engineer of DG set OEM, all payment to DG Set OEM shall be from supplier to DG Set OEM/ Service provider and BHEL shall not make any direct payment to DG set OEM/ service provider, for material & services covered in this specifications No. OR 12488 Rev 00.
- 1.6 Notwithstanding anything mentioned either in this specification or any future drawing approval or approval or MOM or inspection or correspondence by BHEL, ensuring safety, ergonomics, adequate safe working space for maintenance and operation, aesthetics and use of sound engineering practice, compliance with CPCB and other applicable norms, providing adequate clearances for components and assemblies and proper integration of various assemblies irrespective of whether the same is explicitly mentioned in specification or not shall be solely responsibility of supplier, and shall be taken care by supplier only during design, drawing submission, manufacturing, Installation and commissioning. BHEL can not be hold responsible if these aspects are violated by virtue of any approval, MOM, correspondence or inspection by BHEL.

The technical details and specifications are covered in “PART – II TECHNICAL DETAILS & SPECIFICATION OF THE EQUIPMENT”

2. DELIVERY:

FOR- Destination : CRX BHEL Bhopal.

A. CONSIGNEE

Consignee for material shall be CRX BHEL Bhopal. Detailed Consignee address shall be furnished with LOI/ PO.

3. OFFER & PRICES:

Offer should be given in two bid system:

**Techno commercial bid
Price Bid**

BHEL standard purchase procedures shall be applicable for the tendering system.

3.1. TECHNO COMMERCIAL BID:

The techno-commercial bids shall contain all details but with the price column of the price bid format blanked out. However, a tick (√) mark shall be provided against each item of the price bid format to indicate that there is a quote against these item in the priced bid. Refer B2B site of BHEL Bhopal for details.

3.2. PRICE BID:

The price bid shall contain only the prices against 3.2(a), (b), (c), (d) and (e) duly filled-in. The price format must be signed by the authorised signatory of the bidder.

Prices should be quoted as below:

- (a) SELF GENERATING MOBILE LIGHTING TOWER (SGMLT), (BHEL Item Code BP 9048134056), price quoted by supplier shall include price of the main equipment i.e. fully assembled MOBILE LIGHTING TOWER complete in all respect, (as per **clause 2.1 of Part II** and confirming to this technical specification OR 12488 Rev 00). The main equipment price shall also include commercial packing charges, initial fill of lube oil and three free services refer **Cl. 16.G of Part I**. However spares and accessories which are not part of main equipment, shall **not** be included in this price component, and to be quoted separately, refer clause **3.2 (b) of part I**, below.
- (b) Spares & accessories as per **clause 2.2 of Part II** (BHEL Item Code BP 9048134064) price quoted by supplier shall include spares, accessories, installation items, service kit etc. and other items which are not part of main equipment, and detailed in CL. **6 of part II**.
- (c) Lump sum installation & commissioning charges as per **clause 2.3 of Part II**, (BHEL Item Code BP 9048134072), Price shall be quoted by supplier for services required at Rig-site as per clause **16 of part I**.
- (d) Incase if commissioning and load testing at site gets delayed due to reasons beyond our control and if as per OEM (Engine manufacturer) standard it is required to carry out any preservation process prior to start- up of DG Set of SGMLT at Rig-site, supplier must also quote such preservation charges separately with break-up of material & service charges. Techno-commercial offer of supplier shall have details of

material requirement, process and timing of such preservation process as per **clause 7 of Part II**. Validity of such offer shall be 2 yr.

- (e) Supplier to separately indicate per day charges of their service engineers for trouble shooting/ commissioning. Validity of such offer shall be 2 yr.
- (f) Along-with offer bidder must inform their works/ warehouse from where above items shall be dispatched to consignee. Bidder shall also furnish information regarding weight & Volume (L*W*H, i.e. Length, Width & Height to be separately furnished).
- (g) No separate charges shall be applicable for, packing and forwarding or training at supplier's works or for training at site.
- (h) Prices and other terms to be quoted as per annexure "Indigenous vendor commercial terms" enclosed with enquiry. Taxes & duty to be quoted separately.

Note:

- (1) Prices of items and services covered under **clause 3.2 (a), (b) & (c) of Part I** shall be considered for bid evaluation purpose. Prices of items and services covered under **clause 3.2 (d) & (e) of Part I** is for reference only, for any future/ unforeseen requirement and shall not be considered for comparison of bids.
- (2) Order for main equipment, spares & accessories and commission charges at Rig-site shall be placed on the single source.
- (3) The bids shall be evaluated based upon "Total Cost to BHEL" which will also include installation & commissioning charges, taxes, duties, freight, insurance, loadings due to non compliance of BHEL commercial terms etc., as per standard practice of BHEL.
- (4) Along-with techno-commercial offer vendor shall furnish un-priced list of items proposed to be supplied against this enquiry.

4. TERMS OF PAYMENT:

- 1. BHEL standard condition for payment is, 90 days after dispatch and on receipt & acceptance of material at BHEL Bhopal. Any deviation from above shall attract applicable loading/s for purpose of comparison of bids.
- 2. Release of Payment:
 - A. For material: 90% payment as above (**clause 4.1 of Part I**).
 - B. For services: 100% payment for activities completed, against duly countersigned signed commissioning report by ONGCL and/or BHEL at Rig-site, as per **clause 16 of Part I**.
 - C. Remaining 10% for material: After successful testing & commissioning at Rig-site, submission of satisfactory commissioning & test report duly countersigned by ONGCL and/ or BHEL as per **clause 16 of Part I**, furnishing Bank guarantee by supplier as per **clause 18 of Part I** and all documentation as per **clause 6 of part I**.

5. **SUBMISSION OF OGA & SCHEMATIC DRAWING WITH OFFER:**

As required in **clause 6 (A):3 of Part I**, along with the offer, the supplier shall submit OGA drawing of fully assembled SGMLT complying with **Part II** of specification, and other clauses mentioned in this specification. OGA drawing shall have plan and elevation of SGMLT displaying proposed locations of:

- A. Diesel engine
- B. Alternator
- C. Tower with dimension of each section
- D. Trolley with tyres (Stay jack location to be shown in pulled in & pulled out condition)
- E. Pulling Arrangement/ hook
- F. Luminaries
- G. Console
- H. Acoustic Enclosure & Exhaust
- I. Cradle
- J. CG of equipment

with approximate dimensions & weight of Complete SELF GENERATING MOBILE LIGHTING TOWER (SGMLT) shall also be mentioned in above OGA.

As required in **clause 6 (A):4**, along with the offer, the supplier shall also submit complete schematic of console, displaying scheme from DG set up to luminaries.

Submission of OGA drawing & Schematics is required for a broad understanding of complete package offered by supplier, and therefore must be submitted by bidder with offer for acceptance of offer.

Irrespective of acceptance of OGA drawing & Schematic by BHEL, integration of components/ assemblies, providing required clearances and complying safety requirements and statutory norms shall be responsibility of supplier, and BHEL can not be held responsible in any manner for above

6. **DOCUMENTS, MANUALS AND DRAWINGS & SCHEDULE OF SUPPLY:**

The supplier during execution of the Contract shall furnish the following technical documentation. In preparing and submitting the documentation, the requirements given in the subsequent clauses shall be strictly adhered to.

SL. NO.	TYPE OF DOCUMENT	QTY.	TIME SCHEDULE	REMARKS
(A) Along with bid				
1.	Details of items under present scope of supply with P/N, Description, quantity for all items proposed to be supplied	02*	Along with bid	For Evaluation of offer
2.	Price Schedule, as per clause 3	01	Along with bid	Do
3.	OGA drawings as per clause 5	02*	Along with bid	For studying feasibility
4.	Schematic drawing as per clause 5 & BOM of console.	02*	Along with bid	For studying feasibility
5.	Technical Catalogue/ write up	02*	Along with bid	For Evaluation of offer
6.	Filled up matrix of BEC as per clause 7 & Annx.6	01*	Along with bid	Do

SL. NO.	TYPE OF DOCUMENT	QTY.	TIME SCHEDULE	REMARKS
7.	Confirmation of compliance of CPCB norms as per clause (3) of Part II and Copies of Valid Type test Approval certificate by CPCB approved agencies	02	Along with bid	Do
8.	Tech. Details as per annex.4(A)	02*	Along with bid	Do
9.	Information regarding Lube Oil, Coolant (if applicable) & Preservation Process as per clause 7 of Part II	02*	Along with bid	For information
10.	Clause wise Reply to BHEL specification	01	Along with bid	For evaluation of offer
11.	Details of Engine & Alternator Offered	02*	Along with bid	For evaluation of offer
12.	Design calculation confirming suitability of offered equipment for 100 kmph wind velocity, as per cl. 11 of Part II & Annex-4 (B)	02*	Along with bid	For evaluation of offer
13.	Sling orientation & Lifting Arrangement with lifting Part details for lifting of main equipment by crane during handling.	02*	Along with bid	For evaluation of offer

Note:

- Bidder to submit information as above, for evaluation of offered item.
- Bidder shall submit document checklist, with details of document submitted by them against as required here in clause 6(A) of Part I.
- For (*) marked documents - Desirable that in addition to hard copy for records, all Technical information in soft copy is provided on 1 CD, for ease of evaluation.
- BHEL may call additional documents as required for evaluation of offer.

(B) Within 2 weeks from LOI/ PO

1.	Detailed OGA Drawing set showing Diesel Engine, Alternator, DG set controls, starting batteries and engine driven charging alternator, acoustic enclosure, Diesel Tank, Exhaust System, Lighting Tower, Luminaries, Lighting Control panel (Console) assembled on trolley with tyres & pulling arrangement/ hook and all other accessories along with weight & clearances. Lifting arrangement drawing for frequent transportation also to be submitted.	02*	Within 2 weeks from LOI/PO	For approval
2.	Schematic drawing from DG Set Output up to luminaires, Engine & Alternator Control, Battery Charging,	02*	Within 2 weeks from LOI/PO	For approval
3.	Wiring diagram for electrical schemes covered in point No. 2	02*	Within 2 weeks from LOI/PO	For approval

SL. NO.	TYPE OF DOCUMENT	QTY.	TIME SCHEDULE	REMARKS
	(above) of Electrical system showing individual component, wiring cable sizes and other details			
4.	Detailed Bill of Material including all items of DG Set, Console, Trolley, Tower & luminaries and other items	02*	Within 2 weeks from LOI/PO	For approval
5.	Detail GA Drawing, Scheme and BOM of Console	02*	Within 2 weeks from LOI/PO	For approval
6.	Engine, Alternator and luminaries make & rating	02*	Within 2 weeks from LOI/PO	For approval
7.	Technical data sheet for diesel engine & alternator	02*	Within 2 weeks from LOI/PO	For information
8.	QA plan & test procedures as per Annexure 2	02*	Within 2 weeks from LOI/PO	For approval
9.	General instruction for Installation, start-up, operation & maintenance	02*	Within 2 weeks from LOI/PO	For information
11.	Manufacturing, Test & Inspection schedule as per clause(9)	01*	Within 2 weeks from LOI/PO	For monitoring progress
12.	Preservation Techniques for diesel engine	01*	Within 2 weeks from LOI/PO	For taking necessary steps
13.	Packing Procedure	01*	Within 2 weeks from LOI/PO	For Approval & taking necessary steps by BHEL
14.	Type Test certificate for luminaries as per IS 10322, Part-5	01	Within 2 weeks from LOI/PO	
15.	start-up & Testing report format with details of checks to be performed at Rig-site prior to/ during commissioning	01	Within 2 weeks from LOI/PO	For approval
16.	Dos & Dont's & precaution during transportation of SELF GENERATING MOBILE LIGHTING TOWER.	01	Within 2 weeks from LOI/PO	For information

For (*) marked documents - Desirable that in addition to hard copy for records, all Technical information in soft copy is provided on 1 CD, for ease of processing. BHEL shall ask for additional document/ drawing as required during approval.

(C) FINAL DOCUMENTS ALONG WITH CONSIGNMENT

1	Installation, Storage, Operation & Maintenance Instruction Manual, Maintenance Schedule, Troubleshooting Manual in hard copy & PDF for DG Set & complete "self-generating mobile lighting tower"	6\$ + 2*#	Final documents along with consignment	As part of final documentation.
2.	Spare catalogue with part no. in hard copy & PDF	6\$ + 2*#	Final documents along with consignment	As part of final documentation.
3.	Final OGA Drawing set showing Diesel Engine,	6\$ + 2*#	Final documents along with consignment	As part of final documentation.

SL. NO.	TYPE OF DOCUMENT	QTY.	TIME SCHEDULE	REMARKS
	Alternator, DG set controls, starting batteries and engine driven charging alternator, acoustic enclosure, Diesel Tank, Exhaust System, Lighting Tower, Luminaries, Lighting Control panel (Console) assembled on trolley with tiers & pulling arrangement and all other accessories along with weight			
4.	Final Detailed Bill of Material	6\$ + 2*#	Final documents along with consignment	As part of final documentation
5.	Electrical wiring diagram ,Scheme and OGA of Console, starting ckt	6\$ + 2*#	Final documents along with consignment	As part of final documentation
6.	Warranty Certificate	1\$	Final documents along with consignment	As part of final documentation
7.	Copy of CPCB Approval for DG set as per Clause 3 of Part II	6\$ + 2*#	Final documents along with consignment	As part of final documentation
8.	Type Test certificate for luminaries as per IS 10322, Part-5	6\$ + 2*#	Final documents along with consignment	As part of final documentation
9.	a. Performance Test Report b. Material Test Certificates c. Manufacturer's internal test report d. QA report for material used as per OEM standard	2#	At the time of final inspection	As part of final documentation
<p>1. 6\$ (6 (Six) Sets/ per SGMLT Set) shall be despatched to BHEL Bhopal at the time of dispatch of main equipment. BHEL Bhopal shall forward these documentations (six set per SGMLT) to customer</p> <p>2. # (2(Two) Sets to be despatched to BHEL Bhopal, at the time of Dispatch of 1st (First) SGMLT. However documents as per 6(C).9 shall be despatched to BHEL Bhopal at the time of dispatch of each SGMLT, as these documents pertain to individual Set and will be required by BHEL for getting DG Set cleared by customer/ TPI.</p> <p>3. For (*) marked documents - Desirable that in addition to hard copy for records, all Technical information in soft copy is provided on 1 CD,</p>				
(D) AFTER COMMISSIONING				
1.	Duly signed commissioning Report with parameter values as per clause 16	1 per MOBILE LIGHTING TOWER		To be submitted to BHEL
2.	As built drawings (Only if some changes have been done during commissioning)	6\$+2*# (for each site)		Only if some changes have been done during commissioning
<p>6\$- 6 copies for respective rig site. & 2#- 2 Copies for BHEL record For (*) marked documents - Desirable that in addition to hard copy for records, all Technical information in soft copy is provided on 1 CD.</p>				

NOTE:

The supplier shall provide all information regarding parameters calibrated at Rig-site to the customer / BHEL engineers to facilitate understanding and maintenance. This shall be included in commissioning report format as well as troubleshooting manual.

Technical documents & drawing, covered in 6B, 6C & 6D of Part I (with # mark), for BHEL shall be forwarded, in hard copy & Soft copy directly (through courier) to following addresses:

AGM (CEE)
Block III, Western annexe
Gr. Floor
BHEL Bhopal
Piplani, Bhopal (MP)
India 462022.

The documents mentioned above can be suitably compiled in the form of manual based on standard practice adopted by the OEM. All the drawings shall be A3 / A4 size and shall be signed by competent authority and certified before issue. Standard drawing practice shall be used. All the drawings shall bear BHEL PO, project name customer's name equipment designation and identification numbers. All the revisions shall be duly recorded and numbered, signed and dated chronologically, maintaining the original drawing number. Bill of material shall contain device designation reference; make type, nominal ratings and other fitting details, if any. The supplier shall be responsible for any loss to the BHEL consequent to the furnishing of the incorrect data/drawings.

7. MATRIX OF BEC (BID EVALUATION CRITERIA):

Supplier shall furnish clause wise reply to Part I & Part II of this enquiry.

Bid should be complete in all aspects covering entire scope of job/supply and should conform to the technical specifications covered in our specification, duly supported with technical catalogues / literatures. Incomplete and non-conforming bids will be rejected outright.

Bidder shall submit completely filled up matrix of BEC (bid evaluation criteria) provided as per Annx.6, for evaluation of offer at our end. BEC should be sent along with the techno commercial offer.

8. ALL CORRESPONDENCE TO BE ADDRESSED TO:

Ms. Helen Khanna
 Sr. Manager (MM) SCR
 BLOCK IV ANNEXE
 BHEL, BHOPAL – 462021
 Tel. No.: 0091-755-2503020
 Fax no. :0091-755-2500886
 hkhanna@bhelpl.co.in
 & copy to: rshingwekar@bhelbpl.co.in

9. DRAWING / DOCUMENT SUBMISSION & APPROVAL:

- i) Within two weeks of receipt of LOI/PO supplier shall depute their engineer along with electrical and mechanical drawings of SGMLT. BHEL will provisionally approve / give their comments within two weeks of receipt of drawings and discussions with supplier's engineer and ultimate customer (if so required). Final approval shall be furnished only after verification of assembled job (1st SGMLT).
- ii) Manufacturing schedule shall be furnished by supplier so that BHEL/ONGCL can optionally make any visit to the supplier manufacturing plant during engineering and manufacturing.
- iii) Supplier to submit documents as mentioned in i) & ii) above, within two weeks after receipt of LOI/PO whichever is earlier.
- iv) Supplier to note that design, manufacturing, testing, supply and load testing of SGMLT shall have to be taken up in totality and ensuring safety of equipment and personnel, integration of various subsystem like Trolley, DG, Control panel, diesel tank, cabling, fuel lines, Tower & Luminaries for proper function and accessibility of components of operation and maintenance shall be supplier's responsibility, irrespective of any approval by BHEL. During approval BHEL shall only scrutinize and suggest improvement, if any, required in supplier's drawings. Approval or inspection by BHEL shall not absolve the supplier in any manner from their responsibility of fulfilling requirements of this specifications, meeting statutory norms, complying law of the land, ensuring safety of equipment and personal, providing necessary clearances between electrical and fuel systems and adhering to sound engineering practice.

10. PROGRESS REPORTS:

Regular progress report on design, manufacture and supply shall be sent to BHEL by supplier on fortnightly basis in the form of PERT/bar chart

11. TRAINING:

After successful load testing & commissioning of the "SELF GENERATING MOBILE LIGHTING TOWER" (SGMLT) at Rig-site, supplier will also provide on job training at Rig-Site to the BHEL/ONGCL staff for one day on operation and day to day maintenance of the DG Set of Mobile Tower and other parts.

12. ACCEPTANCE INSPECTION AT SUPPLIER WORKS:

Bidders should have the required facilities for testing the quoted equipment / material at their premises. BHEL shall depute their engineers to supplier premises for stage/final testing and acceptance inspection in respect of items covered by the contract and as stipulated in this contract.

Supplier shall notify BHEL at least 15 days in advance of the date of the SGMLT will be ready for testing, inspections and acceptance. Records of the internal test results/readiness etc during internal testing shall be made available to BHEL along with inspection call.

Inspection shall be carried out as per approved detailed QA plan based on **Annexure-2** Acceptance Inspection, Testing & QA plan" furnished with this specification. Based on **Annexure-2** the supplier shall submit detailed QA Plan with test procedure/ reference standard, recording format and limiting values within two weeks of LOI, covering tests

as mentioned in **Annexure- 2**, for approval. These documents shall be reviewed by BHEL. In case, there will be any modification desired by the BHEL in the documents supplier shall incorporate the same and revise the detailed QA plan and get it approved by BHEL. Acceptance test shall be conducted at supplier's work as per approved QA plan. Approved drawings, test procedure, limiting parameters, relevant standards etc. shall be made available by supplier during final acceptance inspection. Calibration certificates of testing instruments to be provided by supplier.

After successful inspection/ testing of material as per QA plan, a duly signed inspection and acceptance certificate shall be issued by supplier and counter signed by BHEL's inspectors.

All SELF GENERATING MOBILE LIGHTING TOWER's (SGMLT) shall be subjected to inspection as above before acceptance. In case inspection of assembled SGMLT or Control panel is waived by BHEL due to any reason, the supplier shall be liable to conduct the inspection as per approved quality plan and submit the duly signed report to BHEL. The material in such cases shall only be dispatched after written acceptance of supplier's inspection report by BHEL.

All cost, Charges and expenses for the testing and inspection at supplier works shall be borne by supplier. All reasonable facilities for testing and inspections shall be provided by supplier free of charge. Travel and lodging expenses of inspector shall be borne by BHEL. If the SGMLT offered by supplier does not meet acceptance criteria it shall be rejected, the same shall be rectified by supplier free of cost and fresh inspection call shall be given by supplier.

It is to be noted that inspection by BHEL shall not be in any way absolving supplier of its warranty/performance/contractual obligation.

13. PACKING:

Adequate precaution shall be taken by supplier while dispatching SGMLT TOWER to protect it from scratches and water contact. BHEL Suggests:

1. Parts like Acoustic Enclosure, Exhaust muffler & pipe and MS parts of tower & trolley and tyres etc. shall be supplied wrapped in wrapping polythene cover or any suitable material.
2. At supplier's discretion Breakable delicate/ projected items such as Luminaires, Exhaust muffler & piping may be supplied in separate boxes. The same shall be assembled at Rig-up yard by supplier during commissioning.
3. The exhaust outlet shall be suitably sealed to avoid water/dust ingress during transit & storage.
4. Separate boxes of loose items like battery, spares and documents shall be made for each MOBILE LIGHTING TOWER. Each box shall have one packing list of items inside the box whereas one copy shall be pasted on the top of the box.
5. BHEL shall be informed about preservation procedures to be followed at site by BHEL/ end user, in order to avoid damages during storage

6. Starting batteries shall be supplied in dry un-charge condition, to avoid deterioration before commissioning. Electrolyte and, charging at site at the time of commissioning, shall be in supplier's scope.
7. Loose supplied items shall be assembled by supplier's engineer at Rig site as per their standard procedure at no extra cost to BHEL.

The supplier may suggest better packing procedure and shall get it approved within 2 week of placement of LOI/PO. If the items are dispatched from the supplier's work in dismantled condition, assembly of the same at site shall be in their scope. Commissioning/ Load test schedule may be revised due to unforeseen circumstances. Supplier shall take adequate precaution to ensure that proper preservation techniques are followed while packing to avoid any damage due to outdoor storing of SGMLT after receipt at BHEL/ ONGCL Rig-site, with 95% humidity and saline conditions.

Each Box/ Packing on its outer surface shall have following marking:

- (a) Supply Order No.
- (b) Name of Supplier
- (c) Case No. (Running No. on each box)
- (d) Dimension of Package & Weight
- (e) Consignee
- (f) Warning as required: for example-TOP/ HANDLE WITH CARE/ DO NOT TURNOVER
- (g) One copy of the packing slip shall be preferably pasted over each box and one copy shall be packed inside the box. Packing slip shall have details of item/s inside each pack.

In case consignment contains any hazardous chemicals/ material the bidder shall provide material safety data sheets along with quotation and also while dispatching materials. The bidder shall also provide special hazard identification symbol/s. marking on each packing of hazardous chemical .At the time of shipment, supplier shall forward the following details by email:

1. Packing details comprising of packing case and packing slip details
2. Approximate overall packing sizes & weight for all dispatched items.
3. Preservation procedures for shipped material to avoid damages during storage.

14. LIQUIDATED DAMAGE:

Failure to dispatch the material in time as per terms of delivery quoted in our order would make supplier liable to an unconditional penalty of half percent of the price of the goods in arrears per week at BHEL's discretion, subject to maximum of 10% of order value.

15. DEFICIENCIES & DEFECTIVE GOODS:

BHEL shall visually inspect the equipment after receipt of the same at works. Supplier may depute their representative, at their discretion during Inspection. However it will be the responsibility of the supplier to inform BHEL in advance if they would like to participate in material inspection and verification process. Should any deficiency or defect noticed in the goods during joint inspection same shall be

replaced by the Supplier without any extra charge under no charge invoice. Any complaint in regard to the material will be notified to supplier who shall replace same promptly. The rejected/damaged material will have to be accepted back by the supplier who will bear it's to and fro freight also & the supplier will supply the items at BHEL Bhopal/ site, free of cost "on defective supply and/or un notified short shipments" and carry out repair/replacement at site without any charge.

16. COMMISSIONING AT RIG SITE:

A. METHODOLOGY:

Within two weeks of receiving LOI/PO Supplier shall submit start-up & Testing report format with details of checks to be performed at Rig-site during commissioning, as per **clause 6(B) Part I**. In case any preparedness is required on BHEL part for load testing of SGMLT at Rig-Site, the same shall be communicated. BHEL will intimate the load testing schedule seven to fifteen days in advance, on which supplier's engineer is required at Rig-up yard. Supplier shall depute experienced and qualified engineers, fully equipped with necessary drawings, multimeter, and all tools and tackles as required, for sufficient period to complete commissioning and load testing activities. Lodging boarding & transportation expenses of supplier's engineer/ service personnel shall be borne by supplier and BHEL shall not bear any expenses towards the same. Any additional special tools/material required for erection /testing of SGMLT shall be arranged by supplier on returnable basis.

At Rig-site SELF GENERATING MOBILE LIGHTING TOWER (SGMLT) shall be installed under supervision of supplier's engineer & commissioned by SUPPLIER's engineer, as per OEM guidelines. Commissioning checks and load testing shall be conducted by supplier's engineer/ equipment OEM engineers (arranged by supplier).

Initial fill of lube Oil (other than replacement required during servicing) shall be supplied duly filled up with DG Set of SGMLT, along with supply of main equipment. In case first free service of DG set is due during commissioning, first free service of DG Set shall be performed prior to commissioning at Rig site and supplier/ Engine OEM shall start the engine after first free service. In case first free service is not due the equipment shall be commissioned as per standard procedure. Crane & Man-Power for handling of equipment shall be provided by BHEL and installation of equipment shall be done under supplier's engineer's supervision. Rest of the installation, testing & commissioning at Rig site, shall be completed by supplier's engineer.

All the equipment's covered in this specification are to be tested and commissioned by supplier to BHEL & ultimate customer satisfaction, as per methodology proposed above.

B. START UP; LOAD TESTING & COMMISSIONING ACTIVITIES AT RIG-SITE:

Start-up, testing & commissioning activities to be carried out by the supplier, shall include, but not limited to the following activities (The support which shall be provided by BHEL is marked side by side within bracket):

1. Assembly of separately boxed packed components and preparation and charging of dry uncharged starting battery. Electrolyte arrangement & filling shall be in the scope of supplier. (Unskilled labor shall be provided by BHEL for assistance).
2. Checking of electrical interconnection/ tightness.

3. Erection of earthing pit and termination of earth strip to it. (BHEL shall provide unskilled manpower, for this activity), Supervision shall be done by supplier's engineer.
4. Prepare the engine, radiator (if applicable) and other accessories of SGMLT for commissioning.
5. Pre-commissioning checks, fine tuning of entire system and start-up of SGMLT as per standard procedure of supplier.
6. Observation of performance at full load for 3 (three) hours. Full load means running DG Set with all luminaries ON and also feeding maximum/ available external loads through plug socket provision.
7. Free Movement of Trolley, Wheel operations, rotation of luminary, rotation of tower, working of pulling arrangement and other performance check activities as per supplier's standards.
8. Recording of parameters in test report (to be countersigned by ONGCL and/or BHEL).
9. Supplier shall submit as modified drawings, if any modification in the supplied system is carried out at Rig-ste.

Supplier shall be fully responsible for proper installation under their supervision, start up and trouble free operation of all items under the scope of this enquiry. Supplier shall be fully responsible to resolve problem if any related to supplier scope of items covered in this specification.

Scope of supply includes all hardware, shims, wire rope, flanges/ supports and high tensile hardware's for installation and proper functioning of entire SGMLT including exhaust and electrical connections/terminations.

BHEL shall provide limited support as under:

1. Providing logistics support such as crane, welding set, compressor etc. for installation & load test.
2. Providing man power for material handling, battery charging and erection of earthing pit and termination of earth strip to it under supervision of supplier's engineer.
3. Providing one unskilled labor during testing & commissioning.
4. Arranging diesel fuel.

Supplier shall conduct testing of SGMLT and accessories to the satisfaction of ONGCL and / or BHEL. The SGMLT testing shall be observed for satisfactory performance for three hours at full load.

Any part failing or needing replacement during commissioning. Will be in the scope of supplier and shall be replaced free of cost by supplier. The supplier / designated service provider at site will keep sufficient stock of spares like filters, belts etc. and consumable items for this purpose.

C. ON JOB TRAINING:

After successful testing of the SGMLT, supplier's representative/service engineer will also provide on job training to BHEL/ONGCL staff for one day on operational aspects. The supplier shall demonstrate to optimize the performance of the system. Special emphasis shall be on prior to start-up checks such as Lube Oil, Coolant (if applicable), battery and control module healthiness, operating procedure and precautions to be taken.

D. COMMISSIONING & LOAD TEST REPORT:

After successful load testing of SGMLT as above, supplier will produce duly filled up commissioning/ load test report with modified drawings if any. ONGCL and/or BHEL will sign the commissioning report. Copy of the commissioning report duly counter signed by ONGCL and/or BHEL will be submitted to BHEL Bhopal, for release of dues against installation & commissioning and release of 10% balance payment for material. Supplier to note that date of signing of commissioning report shall be considered as commissioning date for the SGMLT, and after commissioning warranty shall start on signing of load test report at the Rig-site.

E. SUBMISSION OF PRICE FOR SERVICES AT RIG-SITE:

Startup & load test shall be quoted and executed by the bidder, on job basis and not on per day basis. Price shall remain firm irrespective of number of days required for testing and commissioning by supplier's representative. For the completion of job supplier engineer(s) may be required to make more trips to BHEL/ site, if situation demands. In such cases BHEL will not bear cost towards travel & services required during testing and warranty (at BHEL & ONGCL site). Tentatively three to four man days shall be needed, for completion of commissioning & load testing and on job training at Rig-site.

F. TRANSPORTATION OF MOBILE LIGHTING TOWER FROM BHEL BHOPAL TO RIG SITE:

By BHEL, refer annexure-I for Rig site details.

It will be responsibility of SGMLT supplier to inform BHEL regarding Do's & Don't & Precautions for transportation from BHEL Bhopal to site.

G. FREE SERVICE OF DG SET AT RIG SITE:

Each SGMLT unit shall be supplied with minimum 3 free services for DG set in one year as per OEM standards. For purpose of 3 free services, standard service kit required for undertaking free service to be supplied along with lighting Tower spares. The material (spare) price shall be included in Item No.2, i.e., spares and accessories. P/N or details of item in standard service kit to be mentioned by supplier in offer.

The above free services shall be performed by supplier or DG Set manufacturer's authorized service provider. Details of service provider for the location furnished in the **Annx- 3**, is to be furnished by the supplier along with their offer. It is made clear to supplier that the drill site location may be 50-100 Km away from the city / town

furnished in **Annx. 1**. Transportation of service engineer to Rig-site shall be supplier's responsibility.

H. **AFTER COMMISSIONING ACTIVITIES AT RIG SITE:**

Three free services shall be organized by supplier as per OEM's recommendations. As above, the first free service of DG Set may be consumed during commissioning.

17. **WARRANTY:**

A. **WARRANTY:**

Supplier will warrant the products to be free from defects in materials and workmanship and to comply with specification and intended use. The supplier will provide warranty for a period of 30 months from the date of dispatch or 12 months or from the date of commissioning, as per **clause 16(A-D) of Part I** at Rig-site, whichever is earlier. Supplier shall be fully responsible for design, workmanship and functioning of equipment supplied, for warranty period. The warranty applies to all components, i.e., supplier manufactured and supplied components against this enquiry.

B. **PARTS/COMPONENT FAILURES WITHIN WARRANTY:**

Any problem related to SGMLT shall be referred to supplier, who shall depute their engineer, free of charge, within minimum possible time, not exceeding 3 days. Diagnosis of symptom and identification of failed component shall be carried out by supplier. Supplier shall promptly replace any part/component turning defective or malfunctioning or causing improper function of other part of system or not working as desired or affecting safety in any manner. Warranty parts/components and related services for repair or replacement would be to supplier's account and supplier shall provide replacement within a week time ex-works, after getting failure report. Supplier will replace failed components without waiting for receipt of defective component. Services for diagnosis and replacement shall be provided free of cost.

Packaging and forwarding of failed items from site to supplier's work for warranty repairs and back shall be responsibility of supplier. All expenses incurred for to and fro movement of material, from site to supplier's works & back to site shall be borne by supplier. Packing and forwarding charges shall be borne by supplier. Any taxes/levy as applicable shall be borne by supplier. Supplier shall carry out all warranty repair/replacement of components at site. No charges shall be payable for any warranty related services provided by supplier.

If the repairs, replacement or modification referred are of such nature as may affect the efficiency of the equipment, BHEL shall have the right to give to the supplier within one month of such replacement/renewal, notice in writing to carry out test as may be required for acceptance of the equipment.

If the supplier fails to honor their obligation to repair or replace defective goods within a reasonable period of time, if supplier refuses to carry out work under the warranty conditions, if danger is anticipated or in case of severe urgency, BHEL shall be entitled to carry out, at supplier's cost and risk, repair work or replacement deliveries or have it done by a third party. In case supplier has delivered not all goods, BHEL is

entitled to procure the remaining goods at supplier's cost and risk. This does not relieve supplier of any of his warranty/ guarantee obligations. Taxes and duties of any kind whatever imposed by the authorities of the country of the supplier or his sub-contractors for delivery shall be borne by supplier.

If the supplier fails to take proper corrective action to repair/replace defects satisfactorily within a reasonable period BHEL shall be free to take such corrective action as may be deemed necessary at supplier 's risk and cost after giving notice to the supplier. Equipment or spare parts thereof replaced shall have further warranty for a period of twelve months from the date of acceptance.

Supplier shall furnish full contact details for giving warranty calls, as per format provided in Annexure-3, and shall ensure that their engineer/ representative reaches site fully prepared within 48 hours of warranty call. If required Supplier/ it's authorised representative, will be available for warranty calls at Supplier's account.

C. DESIGN PROBLEM:

After installation and commissioning, if the system is not operating as per specifications during warranty period, the same shall be attended by Supplier free of charge and warranty period shall be extended accordingly.

If Supplier has a design situation that requires Supplier service representative to perform services, Supplier warranty services rendered shall be at no charge with all travel expenses related to warranty service calls at supplier's account. Recurring problem and repeated failure of component/s shall be considered as design problem.

If modification in the SGMLT is envisaged, for proper functioning / integration of sub-assemblies of SGMLT, supplier to carry out such modifications free of cost. All services for this purpose shall be rendered by supplier free of charge.

D. COMMITMENT:

1. The supplier will also undertake and confirm that for the equipment to be supplied, provision for supplying spares and services of the equipment 10 years after completion of warranty will be continued.
2. The supplier shall give a commitment that the offered equipment is new and of recent manufacture.
3. The supplier shall also give commitment that in no case the time taken for fulfilling warranty obligation shall exceed following limits:
 - A. Supply of replacement spares, ex-works - 2 weeks
 - B. Deputation of service engineer for warranty call - 5 days
4. In case of equipment going out of production intimation shall be given 1 year in advance for a ONE TIME purchase of the spare parts.
5. Irrespective of engagement of dealer/external service agency for field service of equipments covered in this contract the prime responsibility of providing warranty services lies with supplier.
6. Supplier shall intimate full contact details of any subcontractor/s engaged by them during load testing at Rig-site and commissioning at Rig site.

18. PERFORMANCE BANK GUARANTEES:

Supplier will furnish a Performance Bank Guarantee of 10% of the PO value with validity up to 3 month beyond warranty, along with 90% bill. The term warranty is explained in **clause no. 17 of Part I**. The Performance Bank Guarantee will cover all the items and terms in the P.O. Bank Guarantee format will be provided by BHEL.

19. INDEMNIFICATION:

During the performance of PO/ contract (entered into by BHEL & Supplier, consequent to this enquiry), the indemnity obligations of the supplier shall apply in events to any geographic location where the contract shall be executed/ performed by supplier, or following the Delivery Date, where Equipment is being used by or for the benefit of BHEL.

The supplier shall agree to defend, protect, release, indemnify, and hold BHEL Group (BHEL, M/s ONGCL, their employee, subcontractors or its employee/ contract worker) harmless from and against all Claims arising in favor of supplier Group that are asserted for personal injury, death, or loss of or damage to any property arising out of, resulting from or relating in any way to PO/ contract regardless of whether BHEL or others may be wholly, concurrently, or solely negligent or otherwise at fault, and regardless if any defect in premises, Equipment or material, irrespective of whether preexisting at execution of the contract/ PO.

20. DESIGN, PATENTS AND ROYALTIES:

If any material used or methods or processes practiced or employed in the manufacture of items to conform with the requirements of the contract is/are covered by a patent(s) in respect of which supplier is not licensed, the supplier (of items covered in this specification) shall, before using the method or process, as the case may be, obtain such license(s) and pay such royalty(ies) and license-fee(s) as may be necessary. The supplier shall keep BHEL & ONGCL indemnified from and against any and all claims, actions, demands and proceedings whatsoever brought or made against BHEL & ONGCL on the basis of any patent or infringement thereof claimed or otherwise relating to and arising from any method or process employed or thing done to or in connection with any work executed by the supplier shall, at their own risk and expense defend any suit for infringement of patent or like suit brought against BHEL and/ or ONGCL (whether with or without the supplier being a party thereof) and shall pay any damages and costs awarded in such suit, and keep BHEL and ONGCL indemnified from and against all consequence thereof.

PART II

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TECHNICAL SPECIFICATION OF SELF GENERATING MOBILE LIGHTING TOWER FOR OIL RIG APPLICATION

1. INTRODUCTION:

This specification covers the requirement of telescopic, tilting type self generating mobile lighting tower for oil rig application. The lighting tower should be suitable for operation in harsh environment as applicable to oil rig application, as described below. The lighting tower should also meet following critical requirements:

- a) Regional basic wind withstand capacity: **Up to 100 Km/Hr**
- b) Suitability for Terrain Category: **Category 1 Class A as per IS 875**
- c) DG Set: **CPCB approved 7-8KVA DG Set** (Certificate to be furnished with offer).
- d) Mean probable design life of lighting tower should be minimum **20 years**.
- e) The equipment and component used for manufacturing & assembly of SELF GENERATING MOBILE LIGHTING TOWER (SGMLT) must be suitable for **heavy duty service**, as the equipment shall be subject to rough handling during rig building environment. The equipment shall also be frequently loaded, unloaded and transported from one site to other site on completion of work at existing site.

1A. General site conditions:

- | | | | |
|------|-------------------------------|---|--|
| 1A.1 | Site Location: | : | As per annexure-1 |
| 1A.2 | Ambient Temperature | : | |
| | Maximum | : | + 50 ⁰ C |
| | Minimum | : | + 06 ⁰ C |
| 1A.3 | Relative Humidity (%) | : | up to 95 % |
| 1A.4 | Altitude above mean sea level | : | Less than 1000 Mtrs. |
| 1A.5 | Environmental conditions | : | Dusty , saline onshore oil exploration Rig area |
| 1A.6 | Type of duty | : | Outdoor Continuous duty with Rough handling, during Rig building (Conditions will be similar to construction industry conditions). Shall be frequently transported from one site to other site. |
| 1A.8 | Annual Rainfall | : | Up-to 3000 mm/ Annum |
| 1A.7 | Type of fuel | : | HSD, as per IS 1460 (BSII/ BSIII or BS IV) |

1B. APPLICATION:

- 1B.1 The MOBILE LIGHTING TOWER covered under this specification is required for providing illumination in dark hours for rig building operations of E 2000/ E 1400 type drilling rig, at new drill site. The mobile lighting tower shall be utilized in harsh site conditions and stringent duty as explained above in CL. 1, 1A & 1B furnished here. Supplier to further note that water logging up to 6"-1' is common phenomenon at Oil Rig site.
- 1B.2 For external connection, two number metallic body plug socket (BCH Make DS type) shall be provided in the console. One of the plug-socket shall be for alternate I/P Power for luminaires (When DG set is not working). The second plug-socket shall be used for enabling rig crew to utilize O/P of Diesel Generator Set of 7-8 KVA capacity of SGMLT for general purpose for feeding external load, if required.
- 1B.3 The MOBILE LIGHTING TOWER shall be equipped with electrically operated battery powered starter for manual start, used as standby Generator, without paralleling facility.
- 1B.4 Starting Time: The starting time required from initiating start signal up to operating speed & voltage is attained and the engine and generator are ready to take the load, shall not be more than 40 second.
- 1B.5 As the equipment is indented to be frequently transported, the dismantling of equipment for transportation and re-assembly of equipment at new rig-site must be simple. Minimum required facilities are as under:
- A. All outgoing and incoming electrical connections of luminary should be through heavy duty weatherproof plug & receptacles to ensure quick & convenient dismantling and assembly of electrical connections.
 - B. Cables used for all outgoing and incoming electrical connections of console, ballast, luminary and any other electrical part shall be multi-core, each 2.5 mm sq Cu flexible cable, with minimum one spare core. Any cable with less than 4 cores shall have minimum 2 spare cores.

2. SCOPE OF SUPPLY

Item SI No	BHEL Style Code	Description of item
01	BP 9048134056	Fully assembled and ready to use Self Generating Mobile Lighting tower as per technical specification clause no-5 of Part II complete in all respect with Diesel Engine, Alternator, DG set controls, starting batteries and engine driven charging alternator, acoustic enclosure, Diesel Tank, Lighting Tower, Luminaries, cradle, Lighting Control panel (Console) assembled on trolley with tyres & pulling arrangement and all other as required accessories (part of main equipment) , commercial packing, and

		initial fill of lube oil etc. with three free service of DG set
02	BP 9048134064	Spares, accessories (Not part of main equipment), installation items, service kit etc. and other items which are not part of main equipment, and detailed in CL. 6 of part II
03	BP 9048134072	Installation & Commissioning of mobile lighting tower at Rig-site as per specification clause no- 16 of Part I

3. COMPLIANCE TO STATUTORY NORM:

- A.** The DG Set must comply with the latest applicable CPCB norms for emission & noise pollution. The supplier shall furnish following valid type test report along with their offer, certified by CPCB approved agency for the CPCB norms furnished below:
- a) System & procedure for compliance with noise limits for diesel generator sets (upto 1000 KVA)
 - b) System & procedure for compliance to emission limits for new diesel engines (up to 800 KW) for genset applications.
- B.** The DG set should meet requirement of conformance labeling for CPCB norms as detailed below:

Requirement of Conformance Labeling for norm (a)

- i) The supplier of the 'product' must affix a conformance label on the product meeting the following requirements:
 - (a) The label shall be durable and legible,
 - (b) The label shall be affixed on a part necessary for normal operation of the 'product' and not normally requiring replacement during the 'product' life.
- ii) The conformance label must contain the following information:
 - (a) Name & address of the supplier (if the address is described in the owner's manual, it may not be included in the label),
 - (b) Statement "this product conforms to the Environment (Protection) Rules, 1986",
 - (c) Noise limit viz. 75 dB(A) at 1 m
 - (d) Type approval certificate number
 - (e) Date of manufacture of the product

Requirement of conformance labeling for norm (b)

- i. All the engines (individually or as part of the product) shall be clearly engraved 'Gen-set Engine' on the cylinder block.
- ii. The engine or the product must be affixed with a conformance label meeting the following requirements:
 - a. the label shall be durable and legible;

- b. the label shall be affixed on a part necessary for normal operation of the engine or the product and not normally requiring replacement during the life of the engine or the product.

iii) The conformance label must contain the following information:

- name and address of the engine manufacturer or the engine or product importer (if the address is given in the owner's manual, it may not be included in the label);
- statement that 'this engine or product conforms to the Environment (Protection) Rules, 1986;
- type approval certificate number
- date of manufacture of engine or in case of import, the date of import of the engine or the product

4. APPLICABLE STANDARDS:

The equipment & accessories covered by this Specification shall be designed, manufactured and tested in accordance with the latest relevant standards and codes of practice published by the Bureau of Indian Standards and International standards (British Standards/ IEC & ISO) as furnished below:

IS : 10000: Part 1 to 10, 1980 (Reaffirmed 2006) or	:	Method of Test for Internal Combustion Engine
BS ISO: 3046, Part 1 to 5, 2002	:	Reciprocating internal combustion engine - Performance
IS:1460, 2000	:	Diesel fuels – specification
IS:3043, 1987 (Re-affirmed 1996)	:	Code of practice for earthing.
IS-4722, 2001	:	Rotating Electrical machines – Specification
IS-4728, 1975 (Re-affirmed 1995)	:	Terminal marking & direction of rotation of rotating electrical machinery.
IS-13947, Part-1,3,4, 1993, (Re-affirmed 1998)	:	Specification for Low voltage Switchgear & Control Gears.
IS/ IEC 60947-2	:	Low Voltage Switchgear & Control Gear
IS-1248, Part - 1 to 9, 1991, (Re-affirmed 1997)	:	Direct acting indicating analogue electrical measuring instrument & their accessories.
IS-8923, 1978 (Re-affirmed 2000)	:	Warning Symbol for dangerous voltages.
IS-2551, 1982 (Re-affirmed 2000)	:	Danger Notice Plates.
IS-694, 1990 (Re-affirmed 2000)	:	PVC Insulated cables for working voltage up to and including 1100 Volts.
IS-7372, 1995	:	Lead Acid storage batteries for Motor vehicles.

IS 875:1987 (Part-3).	:	Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures - Part 3 : Wind Loads
IS 2629 : 1985	:	Recommended Practice for Hot-Dip Galvanizing of Iron and Steel
IS 2266: 2002/2008	:	Steel Wire Ropes for General Engineering Purposes
IS 10322, Part-5: 1985/ 2005	:	Luminaires: Part 5 Particular requirements
IS:1460 : 2005	:	Automotive Diesel fuel” –latest amendment
IS 800 : 2007	:	General Construction in Steel - Code of Practice

The applicability of above standards shall be as per relevant clause of this specification (OR 12488 Rev 00) and compliance shall be confirmed by the vendor in their offer. In case of any conflict between standard/s and this specification, provision of this specification (OR 12488 Rev 00) shall take precedence .Wherever these specifications are mentioned, details reference shall be as per above table.

5. TECHNICAL SPECIFICATION:

The lighting tower shall be mobile, telescopic, tilting type, trolley mounted tower with pneumatic tyres. The height of tower shall be 9 meters (from tyre bottom to top of luminaries) including the height of trolley & lighting cradles. The lighting tower shall have 360 degree rotatable system i.e. lighting tower can be rotated 360 degree in any direction clockwise or anti-clockwise. SGMLT shall be frequently transported from one rig-sites to other rig-site few kilometers away. SGMLT must have suitable lifting arrangement for loading in trucks for transportation.

(A) TOWER:

The tower & support shall be suitable to withstand Regional basic wind withstand capacity upto 100 Kmph. The Tower shall be constructed by using MS Plates / Steel tubes in square, polygon or round shape. The tower mast shall be built with 3 to 5 section. The structure shall be subject to rough handling and harsh and saline outdoor atmosphere. Surface treatment & protective coating sequence & process for the complete tower shall be as under:

Sr. No.	Applicable For	Process	Protective Coat	DFT/ Profile
1.	Entire Surface	Shot Blast* to SA 2 _{1/2}	NA	50-70 micron
2.	Entire Surface	Galvanizing as per IS 2629	Hot dip galvanizing	100 micron (Tolerance +50/-10)
3.	Outer Surface	Light Sweep Blast & cleaning	For zinc slat removal without damaging the zinc deposits	
4.	Outer Surface	Primer Coat. Make – Refer below ^{\$}	Zinc rich Epoxy Primer	40 micron (min)
5.	Outer Surface	Finish Coat Make – Refer below ^{\$} , Shade-Refer below [#]	High Built Aliphatic Epoxy Polyurethane	100 micron (min)

- * Sand blasting is not acceptable.
- ^{\$} Acceptable make: Berger, Asian, Nerolec, Exonoble. Primer coat & Finish coat shall be of the same make only.
- [#] Shade of finish coat: During final painting of complete tower structure standard safety color code shall be complied with so as to provide clear visibility to the operators of dumpers, dozers, tippers etc for safety against collision/damage during night time. In case such code is not applicable BHEL preference shall be for RAL 9010, superior white/ Silver shade. Supplier shall inform paint shade being adopted by them and get BHEL approval prior to going ahead within 2 weeks of receipt of LOI/PO.

NOTE:

1. Minimum cross section for lowest section shall be 150x150x5. Minimum cross section for second lowest section shall be 125x125x5. Minimum cross section for top section shall be 75x75x4. An equivalent section modulus (for shapes other than hollow square tube) is acceptable.

2. Minimum thickness for lowest & second lowest section shall be 5mm. For other section (except top section) the minimum thickness shall be 4.5mm. Minimum thickness for top section shall be 4mm.

(B) HEAVY DUTY TROLLEY:

The heavy duty trolley shall be built with MS Channel/Angle/Plates frame work and can have either 2 or maximum 4 wheel base. Trolley top shall be min 05 mm chequered / MS plate. In case of 4 wheel base, parking brake is to be provided. Trolley shall also be provided with tow eye/hook and tail light reflectors. The trolley shall be provided with suitable numbers (minimum 4 Nos.) of heavy duty, riggers (stay jack). The riggers would be grounded with the help of screw jacks, to be used for proper balancing/stability of tower to ensure stability of tower when fully erected on screw jacks with tyres free from ground. The riggers may be extendable horizontally, to ensure enough radius of overturning and safety factor against overturning.

Trolley tyres & tubes shall be of CEAT/APOLLO/MRF/ BRIDGESTONE make only. Trolley design & suspension should be of heavy duty type suitable for rough roads in remote/interior locations of oil rig sites.

Box/ es, (apprx. 2' x 2'x 1.5') supported on suitable angles, shall be provided below chequered plate level for safe storing of spares & tools etc. For these box/es top cover/s, suitable rectangular (preferably) cutout shall be made on chequered plate and the removed piece shall be hinged with heavy duty hinges, at one major dimension to serve as hinged cover with provision of lock at suitable edge. In case it is not feasible to provided box below surface level, then suitable storage to be provided as per OEM design.

Suitable support with clamps shall be provided for resting of and folded (minimized length) tower for safely during transportation. Vendor shall confirm requirement in their offer and submit OGA drawing. Arrangement shall be finalized during drawing approval to BHEL satisfaction.

Surface preparation and protective for trolley shall be as under:

1. Surface preparation :-
 - o Shot Blast to 45-55 microns roughness.
2. Chequered Frame & Trolley Frame:

Two coats of Epoxide primer to & two coats Black High Built Coal tar epoxy paint. Min DFT- 175 microns.

(C) MOTORISED & MANUAL WINCHES AND ROPE:

Motor (electrical motor) operated winches to be provided for operation of tower i.e. for both telescopic & tilting movement. Motor/ Power tool shall be integral part of SGMLT, and shall be enclosed in whether proof IP 65 enclosure, for rain protection. Provision should be available to operate the winches manually also, to bring the lighting tower in tilted, transportable condition, in the event of loss of power/defective winch. Galvanized/SS wire rope of M/s Usha Martin make, confirming to IS 2266: 2008, only to be used for winches without any intermediate joint. Supplier to furnish the test reports for wire ropes & winches.

Safety mechanism shall be provided to cut-off the motor automatically when telescopic tower is fully erected. The mechanism & controlling mechanism for this purpose must be enclosed in whether proof enclosure suitable for protection during heavy rains.

There shall be arrangement for installation & maintenance of light fitting/lamps at ground level. The tilting arrangement of tower would be balanced and not give any jerk or need a push/pull to activate the operation. The interlocking arrangement to be provided to ensure that tower tilting cannot be done while tower is in telescopic mode and vice versa.

Supplier shall furnish technical parameters of offered winch and steel rope, as per of **Annx. 4. Minimum safety factor for winch shall be 3, whereas for rope minimum safety factor shall be 10.**

(D) DG SET:

A minimum 7 to 8 KVA nominal rating DG set, engine confirming to IS 10000/ BS ISO 3046 , and alternator confirming to IS 4722, capable of delivering single phase, 230VAC at 0.8 PF to be provided on trolley for source of power. The nominal rating of DG Set shall be 230 VAC, 50 hz, 7 to 8 KVA, however the DG Set shall have facility to adjust the voltage in +/- 4% range (or more) and engine governor shall have facility to adjust the RPM & frequency in +/- 2% range (or more). The DG set shall be housed in an acoustic enclosure for meeting sound & exhaust emission norms and shall have Central Pollution & Control Board (CPCB) approval. This is mandatory requirement for qualification of DG Sets for use in lighting tower system and copy of CPCB certification to be furnished along with offer.

An air cooled heavy duty diesel engine of suitable rating to deliver desired output along with self excited, self regulated, continuously rated, brushless type alternator

of 7-8KVA shall be used for DG set. Engine-Alternator shall be of following makes only.

1. ENGINE: Kirloskar, Mitsubishi, Cummins, Caterpillar
2. ALTERNATOR: MECC, NSM, Kirloskar, Lorey Somer, Stamford, AVK, KEL, Crompton Greaves

Supplier shall provide the following details of engine & alternator along with the offer:

- a) Make & Model No of Engine
- b) Rating of Engine i.e. BHP, RPM etc
- c) Fuel tank capacity
- d) Fuel Consumption per Hour
- e) Safety features
- f) Make & Model of Alternator
- g) Rating & PF of Alternator
- h) After sales & service details

Suitable battery generally confirming to IS 7372, for electric start of engine, of Exide, Amco or Yuasa make only. Engine driven battery charger alternator shall be part of DG set. Battery shall be capable of providing minimum five cranks for starting of DG set. The DG set shall also be provided with necessary meters i.e. voltmeter for DG Voltage, ammeter, frequency meter, Hour meter, Battery Voltmeter and indication for Battery charging ON, etc for monitoring of power generated and consumed. The DG set shall have all the critical safety features i.e. LLOP, V Belt failure (For Blower fan), High cylinder temperature switch, Emergency stop etc.

Fuel tank capacity shall be suitable to run the DG set minimum for 12 hrs at full load and fuel tank should be made out of minimum 14 SWG MS sheet duly treated / painted for diesel fuel compatibility. Fuel tank shall be provided with breather, level indicator, air vent, drain plug, wire mesh filter. Draining through gravity should be possible.

(E) LUMINARIES:

The lighting tower shall be supplied 6 (Six) number duly installed whether proof, high intensity, light weight flood light fitting. The light fitting should be dust, moisture & vermin proof, whether proof with IP 65 enclosure. Ballast/ Choke shall be copper wound and shall be mounted in whether proof box/es with IP 65 protection. The luminaries shall be of SS/ High pressure Die cast Aluminum having highly polished mirror finish stainless steel/ High purity AL, electromagnetically brightened reflector. Light fitting shall be supplied with clear, heat & impact resistant, toughened glass of adequate thickness along with endless neoprene gasket. The light fittings shall also be vibration proof. The tower should be designed with provision of fitment of at least 6 lights on one side, if required. All the light fittings should also be adjustable to

rotate in different directions, and vertical angles. Light fittings shall be supplied with suitable adapter (for connector fitment) and whether proof connectors enabling user to easily disconnect and separately pack fragile light fittings for long distance transportation.

6 Nos 400W Metal halide lamp (White light) to be provided for above lighting fixtures for optimum flicker free beam spread and maximum area coverage suitable for operation with 240VAC, 50Hz supply. The luminaries should work normally in 220-240 VAC range, i.e., Voltage & Frequency range generated by DG set. Light fittings should have type test certificates as per IS 10322, Part-5. Light fitting shall be of Bajaj, Phillips, GE, CG make only. Ballast & Bulb shall be of same make as that of luminaries. Bulbs to be supplied fitted with light fittings. The lumen output of lamps shall be 30000 lumens minimum (Lumens after 100 burning hours). The bulb shall have E-40 type cap.

All connections to luminary shall be through weather proof IP 65 metallic plug & sockets (in supplier's scope). To avoid hanging of this plug & socket suitable aluminum adapter shall be provided by supplier for fixing on solid surfaces of luminary. Surface crossing of cables shall be through IP 65 metallic (Brass/ SS/ Al alloy) glands only. Cables used between console, ballast and luminary shall be flexible, multicore Cu cable having minimum cross section of 2.5 sqmm and suitable sheathing for core protection.

(F) LIGHTING CONTROL PANEL/ CONSOLE :

A lighting control panel for controlling the tower lights shall be provided on the trolley. The lighting console panel, fabricated out of 14 SWG/ 2mm min CRC sheet, shall suitable for outdoor application conforming to IP65 protection (minimum), and shall have additional canopy (enclosure) at top for rain protection. The control panel (Console) will consist of suitably rated switchgears i.e. incoming MCCB/MCB with ELCB (or RCBO), Contactors, ammeters, voltmeters etc for isolation, protection & control of 240VAC, single phase, 50Hz. Each lighting feeder circuit shall have individual MCB for short circuit protection & individual ELCB for 30mA earth leakage protection (in place of MCB+ELCB RCBO can also be used) required. Indication lamps shall also to be part of control panel. All switchgears should be of approved make only as per details furnished in Annx-5. (ABB /Siemens/ Schneider/L&T/Legrand).

All the light fittings shall be pre-wired including copper conductor cabling from control panel to luminaries. The cables should be properly supported by whether proof conduits or other means and should not infringe during raising & lowering of tower. Individual conducting core of cable should not be less than 2.5 sqmm copper conductor.

Two number DS type metallic 16A socket & plug, BCH Mk to be provided. One no. shall be for incoming supply with MCB from external source. Second plug-socket shall be catering to other small utilities (Max 2 KW, external to SGMLT) during erection of the rig. Suitable MCB+ELCB combination / RCBO (100 mA) to be provided for the same. Switchgear shall be generally conforming to IS 60947/ IS 13947. MCB / RCBO shall have 10kA fault rating.

The lighting tower should have provision for energizing the lighting system from external source also, in case of availability of external power at site. For this purpose, a DS type metallic 16A socket & plug, BCH Mk shall be provided. Incomer section shall have changeover switch of suitable rating and MCB+ELCB (of 100 mA rating) combination / RCBO for both incoming supplies (DG Set as well as external supply) to feed the external power to lighting system. Proper interlocking with change over switch & protection to be ensured to prevent the mixing of DG power with external power.

The Console shall have following features:

1. All external connections shall be through suitably rated TB's. Minimum two nos, or 10% extra Terminal shall be provided on each TB.
2. Suitable metallic cable gland must be provided at the point of cable passing through boundary and rubber grommet for cable passing through partition.
3. Console door should be hinged and sealed with Neoprene/ EPDM rubber gasket.
4. DG Set O/G MCCB should close only when DG supply is healthy (within required range of Voltage & frequency, suitable for luminaries).
5. DG Set must be capable of taking up step load of all six luminaries simultaneously, i.e DG Set MCCB can be turned ON (without tripping or without more than 5% for 1-2 sec, or permissible dip as per OEM, in V&F) with MCB's of all luminaries are in ON condition simultaneously. If not then, sequencing relay shall be provided to ensure that luminaries turn ON one by one even if MCB's of all luminaries are turned ON simultaneously.
6. DG Starting Battery operated Electrical hooter shall be provided to draw the attention of crew in case of problem.
7. Components must be easily accessible for replacement/ trouble shooting.
8. Electrical Scheme & Brief trouble shooting procedure to be pasted in the form of permanent sticker, anodized AL/ SS label inside Console/ Enclosure door.
9. Sticker/ label to be placed near each device for easy identification with nomenclature same as appearing in wiring diagram of electric circuit.
10. Metering & Indication shall be provided for:
 - A. Load on DG (Indication)
 - B. Load on External Supply (Indication)
 - C. Multi Function Meter with V, I, F, W & E feature (may be part of DG).

(G) OTHER FEATURES OF SELF GENERATING MOBILE LIGHTING TOWER:

1. Considering frequent transportation & rough handling requirement, all items are required to be anchored with frame/ load bearing member to ensure no damage takes place during loading unloading & transportation.
2. Diesel Lines shall be away from electrical cabling & Battery installation location.
3. Provision for earthing of DG Set, Alternator, luminaries should be as per IS 3043. Earthing points shall be adequately marked.
4. Cautionary Marking for Presence of Electric Voltage as per IS 8923 shall be in the scope of supplier.
5. Brief operating instructions, diagram clarifying operation of winch, Do's & Don't etc. to be pasted through permanent sticker/ fastened in anodized AL label form for benefit of operational staff to be provided at appropriate place on the equipment.
6. Supplier must ensure high quality aesthetics. All holes, edges must be properly finished and shaped. Surfaces of trolley, tower and other structure must be adequately prepared before applying primer. Primer and paints application to corners, edges etc. where spray cannot reach should be ensured by adequate quality checks.
7. Sling location to be marked on trolley.
8. Stainless steel/ Heavy duty hinges & door locks are to be provided in SGMLT, wherever required ensuring smooth operation & longer life. Sample approval of hinges shall be taken from BHEL within 2 weeks of LOI/PO.

6. SPARES & ACCESSORIES TO BE SUPPLIED WITH EACH MOBILE LIGHTING TOWER:

Each lighting tower unit to be supplied with following minimum spares & Accessories as detailed below:

- (A) Set/s of Service Kit for minimum 3 free services for DG set in one year from date of installation/commissioning. For the purpose of 3 free services, standard service kit (having filters & other consumable requiring replacement during free services) required for undertaking free services to be supplied by supplier along with lighting tower. Details of item in standard service kit to be mentioned by supplier in offer.
- (B) Pedal Pump (Tyre inflator) with pressure gauge: 1 No.
- (C) Bulbs (Metal Halide) : 2 No.
- (D) Ballast (Copper Wound) : 1 No.

7. INFORMATION REGARDING CONSUMABLES, i.e., LUBE OIL & COOLANT (If Required) & PRESEVATION PROCESS:

1. LUBE OIL:

In their offer, bidder shall furnish information regarding lube oil replacement periodicity and quantity required per fill. The offer shall include grade, and preferably trade name & make of lube Oil recommended/ approved by OEM of the engine and equivalent commercially available Lube Oil in India, from reputed companies such as M/s IOC, HPCL etc. Bidder shall also furnish required details of Lube Oil to be used in offered engine, for reference and regular local procurement of lube Oil in long term.

2. COOLANT (NOT APPLICABLE IN CASE OF AIR COOLED ENGINE REQUIRED IN BHEL SPECIFICATION No. OR 12488 Rev 00):

~~In Bidder shall furnish following information regarding coolant:~~

- ~~A. Quantity of coolant required for each fill, including radiator tank capacity, radiator tube capacity etc.~~
- ~~B. Grade of coolant and specification of recommended specific coolant~~
- ~~C. Source/ manufacturer of coolant including Indian supplier if any.~~
- ~~D. Shelf life & operational life of coolant~~
- ~~E. OEM's recommendation for transportation of Power Pack with coolant filled in from BHEL to site. Bidder shall clearly specify with reasons, whether the coolant is to be drained or should remain filled in radiator during transportation from BHEL to site and special transport requirement, especially from hazard point of view.~~

3. PRESERVATION PROCESS:

Incase if load testing at site gets delayed due to reasons beyond BHEL control and if as per OEM standard it required to carry out any preservation process prior to start- up of DG Set at site/ Rig-site, the supplier shall furnish complete details of such process with material requirement and process to be carried out at site prior to starting of DG.

8. GENERAL CONDITION:

Though a broad outline on the requirement has been made, yet the scope should include anything not mentioned but required for completeness of the system to meet the requirement of a heavy duty & sturdy, transportable "SELF GENERATING MOBILE LIGHTING TOWER", suitable for rough handling and frequent transportation at harsh drilling rig industry atmosphere and outdoor application with rainfall upto 3000 mm/ annum.

9. NAME PLATE:

Name Plate bearing following information (engraved/ embossed) should be provided on the body of the main unit of the system.

BHEL PO Number
 BHEL Specification No.
 Manufacturer's Name
 Sl. No.
 Model Number
 Size
 Year of Manufacture
 Weight of equipment/component
 DG Set Details
 Any other information
 Standards it complies

10. APPROVED MAKE & MATERIAL APPROVAL:

The make of the components shall be as per the approved Vendor List, furnished in Annexure-5. For other items not covered in vendor list supplier shall use field proven material and source it from reputed manufacturer/ suppliers only.

Prior to manufacturing the supplier shall submit sample of following material meeting specification requirement, for approval of BHEL and shall use the same only after approval by BHEL (Catalogue of material instead of sample may be acceptable based on BHEL discretion) :

1. Multicore cable of all variety
2. Cable Gland of All Variety
3. Plug & Socket of all variety
4. Conduit of all variety
5. Adapter for holding plug & Socket.
6. Multifunction meter

11. DESIGN CALCULATION FOR SAFETY AGAINST WIND PRESSURE & OVERTURNING:

A. Alongwith the offer the supplier shall submit calculations for:

1. Designed wind speed
2. Designed wind pressure
3. Wind force on individual components
4. Moment due to wind force at individual section at bottom
5. Required section modulus of tower section
6. Overturning moment due to wind force

7. Equipment weight
 8. Restoring moment
 9. Safety factor for overturning.
 10. Shear Force at bottom of tower fixing
 11. Shear force capacity of individual bolt for tower fixing
- B.** Calculation procedure for evaluation is furnished in **Annx-4 part B**. For calculations parameters value shall be as per **Annx-4 part B** and relevant section of applicable standard. Dimensional details as per OGA drawing submitted along with offer by supplier shall be considered for evaluation.
- C.** Acceptance criteria are mentioned in **Annx.4 part B**. Supplier in their own interest is required to verify and confirm that the equipment offered by them fulfills the same.
- D.** In case supplier adopts a different method for calculations or adopts parameter value other than mentioned in **Annx 4 part B** reason for the same with reference of relevant standard shall be furnished by supplier, for scrutiny of BHEL.
- E.** It is desirable that **manual calculations** inline with **Annx. 4 part B** to be submitted for BHEL scrutiny. However if supplier carries out these calculations with any software, they will submit all parameter values as considered by software, with detailed OGA, detailed logic and software copy to BHEL for verification by BHEL.
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LIST OF ANNEXURE

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4.	Annexure – 4	TECHNICAL INFORMATION TO BE FURNISHED BY THE VENDOR ALONG WITH BID	: 2 Pages
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*Annexure-1***RIG DISPOSITION**

SL. NO.	RIG No.	No. of SGMLT Set Required	Ex-works (From supplier's works) delivery required	PRESENT LOCATION	COMMISSIONING SCHEDULE
1.	E 1400-4	2 Nos.	Jan 2014	SHIVASAGAR (ASSAM)	Feb 2014
2.	E 1400-6	2 Nos.	Jan 2014	SHIVASAGAR (ASSAM)	Apr 2014
3.	E 1400-13	2 Nos.	Jan 2014	SHIVASAGAR (ASSAM)	Jun 2014
4.	E 1400-21	2 Nos.	Jan 2014	SHIVASAGAR (ASSAM)	Aug 2014

NOTE:

1. Location of Rigs given here are present location of the Rig. There is possibility of Rig being shifted to other location at the time of actual commissioning. No price variation is applicable on account of this.
2. There is a possibility of delay in commissioning schedule due to unforeseen circumstances beyond control of BHEL. Supplier shall be liable to take up commissioning activity on our call. No separate charges shall be payable for delay in commissioning schedule.
3. All Rigs mentioned here are land Rigs.

ACCEPTANCE INSPECTION, TESTING & QA PLAN

- 1.0 Inspection & testing at supplier's works shall be carried out as detailed below: -
- I. Visual Inspection of: -
- | | | |
|--------------------|--|--|
| a) Diesel Engine | } Check for overall & mounting dimensions, GA | |
| b) Alternator | } workmanship, rating & | |
| c) Console | } make of components & Bill of material | |
| d) Trolley | } Paint thickness for Tower, Trolley and Console | |
| e) Luminaires etc. | } & other items, Clearance and termination of busbar/ cables | |
- II. Tests of Engine & Alternator combined set: -
- | |
|---|
| a) Alternator Insulation Resistance Test |
| b) Load Test of SGMLT for 1 hr at full load |
| c) Frequency |
| d) Voltage |
| e) Meters and gauges |
| f) Charging of battery |
| g) Engine Starting |
| h) Step Loading with MCB's of all luminaries ON |
- III. Test for Console : -
- | | | |
|-------------------------------|---|----------------------------|
| a) Wiring Continuity check | } | As per wiring diagram and |
| b) Functional Check | } | schematic diagram. |
| c) Insulation Resistance Test | } | Operation as per schematic |
| d) Meters & Indications | } | drawing. |
- 1.1 The following test certificates are to be produced during inspection (also for verification of Make): -
- a. Test Certificate of manufacturer for the Diesel Engine.
 - b. Test Certificate of manufacturer for the Alternator.
 - c. Test certificate of winch.
 - d. Test Certificate of Wire Rope.
 - e. Test certificate for Console & Switchgears
 - f. Test certificate of battery
 - g. Test certificate for luminaires
 - h. Manufacturer's internal inspection report, Performance & material certificate
- 1.2 Tower Raising & Lowering operation through motor & manual operation. Automatic motor cut-off checks in case of tower erection completion.
- 1.3 360 degree Movement of Tower.
- 1.4 360 degree Movement and vertical movement of Luminaries
- 1.5 Ease of maintenance, Luminaire replacement etc.
- 1.6 Raising of SGMLT on stay jacks and making tyres free from ground
- 1.7 QA plan shall be submitted by the vendor 2 weeks after receipt of LOI/PO for approval. QA Plan submitted by the party shall cover list of items offered for inspection, parameter/ characteristics to be inspected, inspection class, type of check, quantum of inspection, Reference Document (Approved Drawing, Test procedure, standard body norms, standard, TC of OEM etc.), Acceptance norm, format



of recording, OEM/BHEL role during acceptance inspection. Dimensions, aesthetics, paint thickness etc. shall also be covered in QA plan.





**CONTACT DETAILS FOR GIVING WARRANTY/SERVICE CALL FOR MOBILE
LIGHTING TOWER/ IT's DG SET**

Rig Site	Name of Agency	Contact Person/s	Postal address	Landline No./ Mobile No./Fax No./ Email ID	Remark
ONGC Shivasagar					
Central Agency if any					

Supplier shall also furnish details of authorized service provider if any for different sub-assemblies, i.e. engine, alternator, battery etc.

ANNX 04 PART A:**TECHNICAL INFORMATION TO BE FURNISHED BY THE VENDOR ALONG WITH BID**

1.0 Checklist for SELF GENERATING TELESCOPIC, MOBILE LIGHTING TOWER: -

SL. NO.	DESCRIPTION	TO BE CONFIRMED BY SUPPLIER
1.	Diesel Engine: - <ul style="list-style-type: none"> • Manufacturer • Model • Type • Rating at 50⁰ • Net Power • RPM • Safety Features • Method of Cooling (Water/ Air Cooled) 	(To confirm Air Cool)
2.	Alternator (Brushless): - <ul style="list-style-type: none"> • Type / Rating / KVA/PF • RPM • Voltage • Class of Insulation • Max fault current • Efficiency • Temperature rise limit 	
3.	Battery: <ul style="list-style-type: none"> • Rating V,AH • Suitable for no. of cranks • Make and Model 	
4.	Motor rating	
5.	<ul style="list-style-type: none"> • Type of luminaries (Integral/ Non-Integral) • Luminaries Rating • Startup Current drawn by each Luminary • Current drawn by luminaire during final stage • Lumen output of luminary's bulb • Adjustment available for Luminary angle 	
6.	<ul style="list-style-type: none"> • Fuel tank capacity • Fuel Consumption rate with all luminaries ON • Fuel Tank Capacity sufficient for Hrs on full load 	Min 12 Hours
7.	Whether supplier has considered lube oil (initial fill) and coolant (first fill) in their offer	
8.	Method of Starting: - <ul style="list-style-type: none"> • Electrical Start 	
9.	Time required for starting from cold to till achieving rated speed and voltage (Sec.)	
11.	Complete list of installed accessories (If required include annexure)	
12.	Information regarding Lube Oil:	

SL. NO.	DESCRIPTION	TO BE CONFIRMED BY SUPPLIER
	<ul style="list-style-type: none"> Capacity of Sump Quantity per fill of Lube Oil Recommended Lube Oil Grade/ Brand Name/s/ Make/s Replacement period in months Replacement Period in Running Hour operation OEM recommended replacement practice OEM recommendation for transportation Any hazard from transportation point of view 	
13	<ul style="list-style-type: none"> Dimension of offered equipment (Attach GA drawing) 	
14	<ul style="list-style-type: none"> Height of offered SGMLT 	
15	<ul style="list-style-type: none"> No of Tower section Details of Lowest Tower section Details of Lowest Tower +1section Details of Lowest Tower +2section Details of Lowest Tower +3section Details of Lowest Tower +4section Details of Lowest Tower +5section Details of Rotating Mechisams 	
16	<ul style="list-style-type: none"> Height of chequered plate surface of trolley from ground Trolley dimension/ Chequered Plate \dimension Height of highest Luminaries from chequered place on trolley Height of rotating mechanism from trolley Tyre size Tyre Make Details of leaf spring/ shock absorber provided No of stay jacks No. of boxes provided for storing material in transit 	
17	<ul style="list-style-type: none"> Gear Ratio of winch Capacity of hoist Working Load of Tower Safety factor of winch Breaking Strength of winch Details of construction of Rope Breaking strength of wire Rope Safety Factor for wire Rope 	
18	<ul style="list-style-type: none"> Details of cable used Details of plug & socket used Protection offered by console enclosure Protection provided by Metallic gland 	

ANNX 04 PART B:**CALCULATION METHOD FOR DECIDING SUITABILITY OF OFFERED MFLT
AGAINST BENDING STRESS & OVER TURNING DUE TO WIND FORCE**

Supplier shall submit calculation for:

Sl. No.	Parameter	Reference	Parameter values
1A.	Basic wind speed in M/s	As per BHEL specification OR 12488 Rev 00	
1B.	Design wind speed	As per IS 875 part -3	K1=0.94 K2=1.05 K3=1
2	Design wind pressure	Do	
3A.	Wind force on luminary	As per IS 875 part -3	C _f = 1.2 (for hemispherical luminary with glass or rectangular luminary)
3B.	wind force on individual members (to be calculated for all components)	As per IS 875 part -3	C _f shall be taken as per table 23 of IS 875 part -3
4.	Bending moment at different section bottom	As per 2 & 3 above and OGA	
5A.	Bending stress of tower material	As per relevant IS (Indian standard) applicable for tower section	Based on tower section shape supplier to specify section
5B.	Section module required (for all tower section)	Based on 4& 5A	
5c.	Section module offered (for all tower section)	As per relevant IS applicable for offered tower section	
6.	Overtuning moment due to wind force (considering entire equipment)	As per 2&3 above, and OGA drawing	C _f shall be taken as per table 23 of IS 875 –part 3
7.	Equipment weight	As per supplier data	
8.	Restoring moment	As per 7 above & OGA	
9.	Safety factor for overturning	Ratio of 6 to 8 above.	Minimum value =2.5
10	Sheer Force at Tower Mounting due to tower components	As per 3 above	
11	Sheer force of each bolt	As per relevant IS	

NOTE: CRITERIA FOR ACCEPTANCE:

1. The section modulus of any section of tower shall be more than calculated “Required section modulus”. Relaxation provided as per IS 800 for temporary loads (wind/seismic) shall not be applicable.
2. Safety factory for overturning must be greater than 2.2.
3. Sheer strength of individual bolt shall be twice that of total sheer force on tower component.

APPROVED VENDOR LIST

<u>EQUIPMENT/COMPONENTS</u>	<u>VENDORS NAME</u>
Diesel Engine	Caterpillar / Cummins / Kirloskar/ Mitsubishi/
Alternator	Kirloskar / AVK / Stamford./ Leroy Somer /KEL/ MECC/NSM/CG
Moulded case circuit breakers	Siemens/ABB/Schenider
MCB/ ELCB/RCCB/RCBO	ABB /Siemens/ Schenider/L&T/Legrand
Fuse Switch Unit	Siemens/ L&T / Areva /CG/BCH/ABB/Alstom/ Schenider
HRC Fuses	Siemens / Areva / L&T/ Schenider/GE
Control Transformer	Ind coil/ AEP/Silcans /Prgati/Prayog/Cands
CT	Kappa/ AEP/ Pragati / Silkaans/ Prayog
PT	Kappa/ AEP/ Pragati / Silkaans/ Prayog
Contacto/ Timer	Siemens/ L&T / Telemec/BCH/ Schenider/ABB
Auxiliary relay	Siemens/ L&T /GEC/OEN/ Schenider/VJV/PLA
Control/Selector switches	Siemens / Kaycee / L&T / Telemec / Salzar /Alstom /HPL /ABB /Siemens /GE
Meters (Voltmeter/ Ammeter/ Frequecy)	AE / Rishabh
Bimetal O/L Relay	Siemens/ L&T/ BCH / Telemec/ Schenider/ABB
Protection Relays	Woodward/Alstom/Easun Reyrole/ABB/Siemens/L&T
Potentiometers	BBTT/ECIL/RS/CSPC
Temperature Scanner &	ABB/OGOGAWG/BELLS/L&T/PECON/OMEGA/
Window Annunciation	PROCON/IIC/Minilec
Indicating lamps &	Siemens/BCH/L&T / GE / Schneider//Technic
Push buttons	
Trivector meter/ Digital meter	Enercon/ABB/SEMS/L&T/ Conzerv/Schneider
Terminals	Elmex / Connectwell / C&S/Phenoix
Cable lug	Dowells/Forward/LUPCO/ Hex
Cable gland	Electromag/CCI/Comet/Bracko
O/L Contactor	Siemens/L&T/Telemec/BCH/ Schenider
Battery	Exide/ Amco/ Yuasa
Plug/Socket	BCH/ Amphenol
CBCT	Kappa/ AEP/ Pragati / Silkaans/ Prayog/Laxmi
Lighting	Phillips/Bajaj/GE/Crompton
Wire Rope	Usha Martin
Buzzer	Cands /Yashmun /JVS/Alan
ELR & it's CBCT	Prok DV/ Schenider
Door Switch	Kaycee
Control Cable/ Cable	Finolex/ L&T/ RR Cable/Havells/ KEI
Hooter	Cands/Yashmun/RS/JVS
Tyres	Ceat/ Appolo/ MRF/ Bridgestone
Paint	Berger, Asian, Nerolec, Asian, Exonoble
Limit Switch	BCH, Siemens

Note: Battery charger, Space heater, Thermostat, Neutral link etc. of reputed make only shall be acceptable

MATRIX OF BID EVALUATION CRITERIA

Bidder to submit this document completely filled up for evaluation of its offer

Sl. No.	Clause	Yes / No	Comments
PART-I			
1	Has the bidder noted and confirmed scope of supply as per clause- 1.1 -1.4?		
2	Has the bidder noted and confirmed scope of services as per clause- 1.5?		
3	Has the bidder noted and confirmed their responsibility for the MOBILE LIGHTING TOWER supplied as per clause- 1.6?		
4	Has the bidder noted and confirmed delivery schedule and consignee as per clause- 2?		
5	Has the offer been submitted in two bid format as per clause 3?		
6	Has the bidder submitted prices against goods/services as per clause- 3.2.(a), 3.2(b), 3.2(c), 3.2(d) & 3.2(e) and complied 3.2(f),3.2(g) & 3.2(h) ?		
7	Has the bidder noted -Notes (1), (2), (3) & (4) appearing at end of clause 3?		
8	Has the bidder submitted details against Note (4) at the end of clause (3)?		
9	Has the bidder noted and confirmed the clause- (4) regarding terms of payment?		
10	Has the bidder submitted OGA drawings with details as per clause 5?		
11	Has bidder submitted documents, drawings & calculation confirming suitability for desired wind speed Sl. No. 1-13 (required with bid as per clause 6A?		
12	Has the bidder confirmed to supply document 1-16, as per clause 6B, two weeks after LOI/PO whichever is earlier?		
13	Has bidder confirms to supply documents 1-9,at the time of dispatch as per clause 6C and 1-2 as per clause 6D after commissioning?		
14	Has the bidder submitted completely filled up matrix of bid evaluation criteria as per clause 7?		
15	Has the bidder noted address for correspondence as per clause 8?		
16	Has the bidder noted and confirmed to provide drawings and manufacturing schedule as per clause 9(i) to 9(iii)?		
17	Has the bidder noted and confirmed clause 9(iv) regarding its responsibility of equipment designed and supplied by them?		

18	Has the bidder agreed to provide progress report as per clause 10?		
19	Has the bidder noted and has agreed to clause 11 regarding providing onsite training after commissioning?		
20	Has bidder noted and confirmed clause 12 regarding providing QA plan and acceptance inspection by BHEL/ONGCL at supplier's works?		
21	Has the bidder noted and comply with clause-13 regarding packing?		
22	Has the bidder noted and confirmed clause 14 regarding LD?		
23	Has the bidder noted and confirmed clause 15 regarding making good any deficiencies & defective goods noted during inspection?		
24	Has the bidder noted and confirmed methodology of commissioning that as per clause 16 A?		
25	Has the bidder noted and confirmed clause 16B regarding "Start-up, Load Testing & commissioning at Rig-site"?		
26	Has bidder noted & confirmed clause 16C regarding providing on-job training at Rig-site?		
27	Has bidder noted & confirmed to provide Load test report as per clause 16D?		
28	Has bidder noted & confirmed clause 16D regarding "Commissioning date & starting date of after commissioning warranty"?		
29	Has the bidder noted and complied clause 16E regarding "Submission of Price for Services at Rig-site"?		
30	Has bidder noted & confirmed clause 16F regarding "Transportation of MOBILE LIGHTING TOWER"?		
31	Has bidder noted & confirmed clause 16G regarding "Free Service of DG set of MOBILE LIGHTING TOWER"?		
32	Has bidder noted & confirmed clause 16H regarding "After commissioning activities at Rig Site"?		
33	Has bidder noted & confirmed clause 17A regarding warranty?		
34	Has bidder noted & confirmed clause 17B regarding Parts & Component failure?		
35	Has bidder noted & confirmed clause 17C regarding design problem?		
36	Has bidder noted & confirmed commitments as per clause 17D point 1 to 6?		
37	Has the bidder noted and confirmed to provide performance bank guarantee as per clause 18?		
38	Has bidder noted & confirmed clause 19 regarding indemnity?		
39	Has bidder noted & confirmed clause 20 regarding Design, Patent & royalties?		

PART II			
Sl. No.	Clause	Yes / No	Comments
1	Has the bidder noted and confirmed that offered equipment confirms to clause 1 (a) to 1(e) (Introduction)?		
2	Has the bidder noted and confirmed that offered equipment is suitable for duty in "General Site Conditions" as mentioned in Clause 1A?		
3	Has the bidder noted and confirmed that offered equipment is suitable for "Application" as mentioned in Clause 1B?		
4	Has the bidder noted clause 2.1 and confirmed clause 2.1 regarding supply of main equipment.		
5	Has the bidder noted clause 2.2 and confirmed clause 2.2 regarding supply of Spares & Accessories.		
6	Has the bidder noted and confirmed 2.3 regarding Scope of Services to be provided by them.		
7	Has the bidder noted and confirmed 3 A regarding meeting CPCB norms and has submitted valid approvals?		
8	Has the bidder noted and confirmed to provide conformance labeling as per clause 3(B)?		
9	Has the bidder noted Applicable standards as per Clause 4 and confirmed compliance to Clause 4?		
10	Has the bidder noted and confirmed that Offered equipment confirms to first Para of clause 5- Technical specification		
11	Has the bidder noted and confirmed that Offered equipment confirms to clause 5 (A) - Technical specification / Tower		
12	Has the bidder noted and confirmed that Offered equipment confirms to clause 5 (B) - Technical specification / Heavy Duty Trolley		
13	Has the bidder noted and confirmed that Offered equipment confirms to clause 5 (C) - Technical specification / Mortised & manual Winches and rope.		
14	Has the bidder noted and confirmed that Offered equipment confirms to clause 5 (D) - Technical specification / DG Set		
15	Has the bidder noted and confirmed that Offered equipment confirms to clause 5 (E) - Technical specification / Luminaries		
16	Has the bidder noted and confirmed that Offered equipment confirms to clause 5 (F) - Technical specification / Lighting Control panel (Console)		
17	Has the bidder noted and confirmed that other features of equipment shall be as per clause 5(G) & Annexure-5		

18	Has the bidder noted and confirmed to provide spares & Accessories for each unit as per clause 6.0		
19	Has the bidder furnished information regarding consumable & preservation required as per clause 7.0		
20	Has the bidder noted and confirmed " General condition" as per clause 8.0		
21	Has the bidder noted and confirmed to provide "name plate/ Rating Plate" as per clause 9.0		
22	Has the bidder noted and confirmed to provide "Approved make & material "as per clause 10.0		
23	Has the bidder noted and confirmed to provide "design calculation for safety against wind pressure & overturning "as per clause 11.0		
24	Has the bidder noted information's furnished in Annx-1 "Rig Disposition"		
25	Has the bidder noted information's furnished in Annx-2 "acceptance inspection, testing & QA plan" and agrees to provide QA plan accordingly?		
26	Has the furnished information's as required in Annx-3 "contact details for giving warranty/ service call for mobile lighting tower"		
27	Has the bidder furnished information's with offer - as per Annx-04-Part A "technical information to be furnished by the vendor along with bid"		
28	Has the bidder furnished information's with offer - Annx-04-Part B "calculation method for deciding suitability of offered SGMLT against bending stress & over turning due to wind force "		
29	Has the bidder noted and confirmed that make of the items shall be as per Annx-05 "approved vendor list"		