

NOTICE INVITING TENDER

**FOR COMMISSIONING (STW, HAT & SAT) OF
IPMS FOR P71(IAC)**

**(TENDER REFERENCE:
DE/P71(IAC)/IPMS/COMM/2019/02)**

OPENING DATE: 08TH NOV 2019

THIS TENDER DOCUMENT CONTAINS 104 PAGES



**Bharat Heavy Electricals Limited
Electronics Systems Division
Electronics City, Hosur Road, Bangalore – 560 100**



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

NOTICE INVITING TENDERS

01. Tender Reference: **DE/P71(IAC)/IPMS/COMM/2019/02**
Due on 18th NOV 2019

02. Name of the work: **Commissioning (to carryout STW/HAT/SAT) of IPMS for P71(IAC) at M/s Cochin Shipyard Ltd.**

03. Period of contract: **01 Year. If required, will be extended further with mutual agreement with the sub-contractor at a price escalation of 5%**

04. Earnest Money Deposit: **Rs. 2,29,473/- (Rupees Two Lakhs Twenty Nine Thousand Four Hundred And Seventy Three Only)**

05. Last Date & Time for the: **Before 1.00 PM on 18th Nov 2019**
Receipt of Completed Tender.

06. Date & Time for Tender: **At 1.30 PM on 18th Nov 2019**
Opening (Technical Bid)

07. Place of submission of:
completed Tender **Tender document shall be dropped at Tender box kept at the Reception, at BHEL - Electronics Systems Division, Plot No. 98, Electronics City, Hosur Road, Bangalore -560100 Or sent by Register post /Speed Post / Courier with Acknowledgement, addressed to S PARANDAMAN, BHEL - Electronics Systems Division, Plot No. 98, Electronics City, Hosur Road, Bangalore -560100 INDIA**

Phone:+91 80 25146123 Mobile: +919886057569 email:
parandaman@bhel.in

This tender document contains 104 pages including the following.

I. Part I - Technical Bid: From Pages 4 - 35

- a) Technical-cum-commercial Bid
- b) Instructions to tenderers

Contractor	Page 2 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

c) Scope of Work

II. Part II - Price Bid: From Pages 36 - 40

III. Annex 1 – Details Of STW: From Pages 41 - 53

IV. Annex 2 – Details Of HAT: From Pages 54 - 68

V. PQC (Pre-Qualification Criteria): From Pages 69- 71

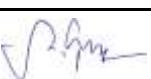
VI. GCC 2019: From Pages 72 - 104

Note:

1. The tenderer shall read the tender documents carefully and fill all the columns neatly. Incomplete tenders will be rejected.
2. The tenderer shall return the duly filled in tender document after affixing signature on all pages.
3. The Tenderers shall ensure and put “Technical cum Commercial bid (Part – I)” & “Instructions to Tenderers” together in one cover and “Schedule of Work / Price Bid (Part – II)” in a separate cover. Both these covers shall be separately sealed and then put together in a single cover and sealed. All the sealed covers shall be properly identified with necessary information such as Tender reference, type of document put inside, date of tender opening to enable to open the correct document cover only.
4. BHEL’s “General Conditions of Contract 2019” form part of the Tender specifications. All pages of the tender documents shall be duly signed, stamped and submitted along with the offer in token of complete acceptance thereof. The information furnished shall be complete by itself. The tenderer is required to furnish all the details and other documents as required in the “General Conditions of Contract 2019” document.

Contractor

Page 3 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

PART - I

TECHNICAL-CUM-COMMERCIAL BID

{Commissioning of IPMS for P71(IAC)}

(To be furnished by the Bidder)

Nature Of Work: Commissioning of IPMS (Integrated Platform Management System) supplied by BHEL-GE Avio for P71 (Indigenous Aircraft Carrier) Ship of Indian Navy, being built at M/s Cochin Shipyard Limited, Cochin. The commissioning activity will involve carrying out STW (Setting To Work), HAT (Harbor Acceptance Test) and SAT (Sea Acceptance Test) of IPMS onboard P71(IAC), under supervision/guidance of BHEL/GE Avio.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Tender Ref : DE/P71(IAC)/IPMS/COMM/2019/02 due on 18th Nov 2019

A) Information Part :

Sl. No.	Particulars	To Be Filled By Bidder
1.0	Name Of The Contractor	
2.0	Address (Office)	
3.0	Address (Residence)	
4.0	Telephone Number	
	Office	
	Residence	
	Mobile No.	
5.0	Email Id.	
6.0	Technical Staff Details (Use Separate Sheet If Reqd.)	Furnished/ Not Furnished
7.0	Working Staff Details (Use Separate Sheet If Reqd.)	Furnished/ Not Furnished



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

B) Essential Criteria For Techno-Commercial Acceptance Of Bid

Sl. No.	Particulars	To Be Filled By Bidder
1.0	Whether Registered with ESI / PF Authority	Yes/ No
1.1	If Yes, indicate PF Registration No. (Copy of last month contribution paid receipt to be enclosed)	Enclosed / Not enclosed
1.2	If Yes, indicate ESI Registration No. (Copy of last month contribution paid receipt to be enclosed)	Enclosed / Not enclosed
1.3	If No, Workmen compensation policy to be produced before commencement of work. Is the tenderer willing to pay the ESI and PF contribution subject to BHEL Terms and conditions.	Yes / No
2.0	Security Deposit Clause as per NIT	Acceptable/ Not Acceptable
3.0	The bidder should have an office at M/s CSL or at Cochin with land line/mobile telephone and E-mail for emergency contact. Please provide address, Phone numbers & E-mail ID. In case there are no offices, the bidder should be ready to establish an office at M/s CSL or at Cochin	Details: Yes/No

Note: If any of the above mentioned criteria is not met the bid will be rejected

Contractor	Page 6 of 68	
------------	--------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

C) Other Conditions:

Sl. No.	Particulars	To Be Filled By Bidder
1.0	Mode of EMD furnished	As per BHEL's GCC 2019
1.1	Particulars (Receipt No. and Date)	
2.0	General Conditions of Contract & NIT	Acceptable / Not Acceptable
3.0	Contract period mentioned in NIT	Acceptable / Not Acceptable
4.0	Payment Terms defined in NIT	Acceptable / Not Acceptable
5.0	EFT form signed & sealed by banker in original is enclosed	Enclosed / Not enclosed
6.0	Cancelled cheque or photocopy of cheque enclosed	Enclosed / Not enclosed
7.0	GST registration No. of Tenderer (Copy of the same to be enclosed)	Enclosed / Not enclosed



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

INSTRUCTIONS TO TENDERERS

Nature Of Work: Commissioning of IPMS supplied by BHEL-GE Avio for P71 (IAC) Ship of Indian Navy, being built at M/s Cochin Shipyard Limited, Cochin. The commissioning activity will involve carrying out STW, HAT and SAT of IPMS onboard P71(IAC), under supervision/guidance of BHEL/GE Avio (as and when required).

1. Sealed Tenders for the above mentioned works are hereby invited from Contractors experienced in works of similar kind and magnitude.
2. Tenders should be addressed to **S PARANDAMAN, Electronics Systems Division, Bharat Heavy Electricals Limited, Electronics City, Hosur Road, Bangalore – 560 100**. The full name and address of the tenderer, name of the work and the date of opening should be indicated on the cover.
- 2.1. The local address of the Contractor, the name of the person to whom all the correspondence are to be addressed, should be indicated with telephone number (both office and residence), FAX /e-mail address, Mobile phone No. etc.
3. All entries in the tender documents should be in the same ink. Erasures and over writing are not permitted. The tenderer concerned with proper indication of the name, designation and address of the authorized person signing should duly sign all cancellations and insertions.
4. Tenderers shall fill in all the required particulars in the blank spaces provided for this purpose in the tender documents and also sign each and every page of the tender document including GCC 2019 and drawings (wherever applicable) attached there to before submitting tender.
5. Rates should be quoted in figures as well as in words in Indian Currency only i.e. Rupees with reference to each item and for all the items shown in the attached schedule. The rates shall include all taxes and duties payable on account of Service Tax, Sales Tax etc., and also expenses towards PF and ESI contributions (see clauses 8, 30 and Annexure 'B' of this document). The tenderers shall fill amount of each item and the total on each sheet as also the grand total amount of the whole contract.
6. Non-conformities between figures and words of the quoted prices: Sometimes, non-conformities/errors are also observed between quoted prices in figures and that in words. The same is to be taken care of as indicated below:

Contractor

Page 8 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- 6.1. If in the price structure quoted for the required goods, there is discrepancy between the unit price and total price (which is obtained by multiplying the unit price by the quantity), the unit price will prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
- 6.2. If there is error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.
- 6.3. If there is discrepancy between words and figures, the amount in words shall prevail, unless the amount expresses in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to 6.1 and 6.2 above.
- 6.4. If there is discrepancy in an offer, the same will be conveyed to the tenderer with target date on the above lines and if the tenderer does not agree to the observation of the purchaser, the tender is liable to be ignored.
7. In quoting their rates, the tenderers are advised to take into account all factors including any fluctuations in market rates. No claim for enhanced rates will be entertained on this account after acceptance of the tender or during the currency of the contract.
8. The rates to be quoted by the tenderer shall be firm and should consist of all taxes including GST. The tax should be quoted in the GST column in Price Bid. The tax rate changes if any during the course of contract will be paid as applicable. If BHEL is required to discharge the liability of any taxes on the transaction like TDS (IT), TDS (WCT), service tax under reverse charge mechanism or any other similar taxes, which is or becomes payable by BHEL, the same shall be deducted from the bills of the contractor.
9. The rates quoted in the tender shall remain valid for a period of 'NINETY DAYS' from the date of opening of tender.
 - 9.1. The price quoted shall be for the following:
 - a) STW Activity:
 - i. Unit rate for carrying out STW for each equipment
 - b) HAT Activity:
 - i. Unit rate for carrying out check on each Hardwired IO Signal
 - ii. Unit rate for carrying out check on each Soft IO Signal

Contractor	Page 9 of 68	
------------	--------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

iii. Unit price for carrying out functional check on each System

c) SAT Activity:

- Unit man day rate for an Engineer for sailing in the sea onboard P71(IAC)
- Unit man day rate for a Diploma Holder for sailing in the sea onboard P71(IAC)

9.2. Tenderer shall not increase their quoted rates, once the tenderer has submitted his quotation and during execution of the contract in case his tender is accepted.

10. Before tendering, the tenderers are advised to inspect the site of work and its environments and be well acquainted with the actual working and other prevailing conditions, position of materials and labour laws. They should be well versed with BHEL General Conditions of Contract, Instructions to tenderers, drawing wherever applicable and specifications and all other documents which form part of the agreement to be entered into subsequent to award of work. The tenderers shall specially note that it is the tenderer's responsibility to have the required Tools & Tackles required for Commissioning of IPMS.

11. Should a tenderer find discrepancies or omissions in the drawings wherever applicable / Specifications / Scope of work / Terms & Conditions attached to the tender documents or should be in doubt as to their meaning, he should at once address to the authority inviting the tender for clarifications.

11.1. Every endeavor is made to avoid any error which can materially affect the basis of the tender but the successful tenderer shall take upon himself to provide for the risk of any error which may be subsequently discovered and shall make no subsequent claim on account thereof.

12. In the event of tender being submitted by a firm, the tender must be signed separately and legibly by each partner or member of the firm or in their absence, by the person holding the power of Attorney on behalf of the firm concerned. In the latter case, a copy of the Power of Attorney duly attested by a Gazetted Officer must accompany the tender.

13. In case, the date of tender opening falls on a Holiday, the tender will be opened on the next working day.

14. Every tender must be accompanied by deposit receipt for the amount mentioned as Earnest Money Deposit. This earnest money will be refunded to the unsuccessful tenderers after finalization of the award of work. In the case of successful tenderer,



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

the earnest money will be retained as part of the Security Deposit for satisfactory completion of the work in accordance with Clause – 1.9 of the BHEL General Conditions of the Contract 2019. Tenders without Earnest Money Deposit receipts are liable to be rejected. No interest will be paid on the earnest money deposits.

15. Conditional and unsigned tenders, tenders containing absurd rates and amounts, tenders which are incomplete or otherwise considered defective, tenders which are not in accordance with the tender conditions laid down by the Accepting Officer and tenders not submitted in the prescribed forms are liable to be rejected.
16. Tenders submitted by post should be sent by "Registered Post with Acknowledgement" or by Courier. These should be posted with due consideration for any delay in postal delivery. Tenders received after the due date of opening of tenders are liable to be rejected.
17. The Contractor's responsibility under this contract shall commence from the date of receipt of the order or acceptance of his tender.
18. Fraud Prevention Policy: As per Clause 1.15 of BHEL's GCC 2019
19. If a tenderer expires after the submission of his tender or after the acceptance of his tender, BHEL may, at their discretion, cancel such tender. If a partner of the firm expires after the submission of the Tender, after the acceptance of the Tender, BHEL may cancel such Tender at the discretion unless the firm retains its character (s).
20. BHARAT HEAVY ELECTRICALS LIMITED will not be bound by any power of Attorney granted by the tenderer or by changes in the composition of the firm made subsequent to the execution of the contract. They may however, recognize such power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
21. If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage. Further the tenderer will be liable for any damage caused.
22. Words imparting the singular number shall be deemed to include the plural number and vice-versa where the context so requires.
23. The General and Special Conditions of Contract are complementary to each other and where they are in conflict, the special condition shall prevail.
24. The expenses for completing the stamping the agreement shall be paid by the contractor.

Contractor

Page 11 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

25. Unless and otherwise stated all tendered work includes commissioning, preventive / break-down maintenance of equipment as agreed to in the contract.
26. After completion of the job Commissioning (STW/HAT/SAT), the contractor has to furnish to BHEL the details of actual work done in consultation with Site-in-charge / Customer.
27. Any covering letter and comments of the Contractor should be submitted in duplicate along with the offer.
28. The Contractor shall provide all general purpose test equipment required for carrying out STW/HAT/SAT, which are not supplied by BHEL. While quoting their rates, the Contractors are advised to take into consideration the above.
29. Should a tenderer or a contractor on the list of approved contractors have a relative or in the case of firm or Company of Contractors any of its shareholder's relative is employed in any Capacity in Electronics Systems Division or Electronics Division of Bharat Heavy Electricals Limited, Bangalore, the authority inviting tenders shall be informed of this fact at the time of submission of the tender, failing which tender may be disqualified or if such a fact subsequently come to light, the relevant provisions of the General Conditions of Contract will apply.
30. These 'INSTRUCTIONS TO TENDERERS' & 'GENERAL CONDITIONS OF CONTRACT 2019 OF BHEL' shall be deemed to form an integral part of the contract agreement for the work to be entered into. In cases of variation between the two in any matter, the conditions in the 'THE INSTRUCTIONS TO TENDERERS' shall prevail.
31. All operations to be carried out by the Contractor during the execution of the contract such as soldering, continuity check etc., shall be done with proper equipment brought by the tenderer. Suitable power point will be provided by site and tapping from the power point to equipment shall be done using proper size of cable and equipment and after getting approval of connections from the site-in-charge / Customer.
32. The Contractor shall comply with the provision of Employees Provident Fund and Miscellaneous Provisions Act 1952 and rules, regulations and other orders issued there under. He, as an employer, shall be liable to pay employer's contribution/deductions towards PF under the PF Act in respect of all labour employed by him, for the execution of the contract in accordance with the provisions of the Employees Provident Funds and Miscellaneous Provisions Act, 1952 as amended from time to time. For this purpose he shall indicate the code number obtained from the Regional Provident Fund Commissioner or he should obtain a code number if he has not and produce the Photostat copy of the challan / receipt of



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

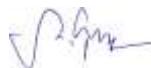
Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

monthly remittance of the contribution made by him to the PF Commissioner. Final payments due to him will be released only on production of a "No due certificate" from the Regional Provident Fund Commissioner wherever applicable. He shall also furnish such returns as are due, under the Act, to be sent to the appropriate authorities through the Principal Employer".

33. The Contractor should get himself registered with the E.S.I. Authorities as an independent Employer, obtain a separate code number and remit the dues in respect of the labour employed by him for the work and produce the Challans / Receipts of remittance of the ESI contributions due under the E.S.I. Act to the Company authorities. He shall also furnish such returns, as are due, under the Act, to be sent to the appropriate authorities through the Principal Employer.
34. If any action is brought in by P.F. Commissioner/ESI authorities on BHEL for the work done by the Contractor for his labourers regarding PF/ESI amount due, short remittances, non-remittances etc., the Contractor shall defend the case on behalf of BHEL and/or reimburse BHEL the expenses so incurred.
35. If applicable, the Contractor shall apply and obtain license under Contract Labour (R&A) Act 1970 and comply with the relevant provisions of this Act in respect of the labour employed by him for executing this contract. The Contractor shall furnish necessary returns to the authority through the Principal Employer.
36. If applicable, the Contractor shall insure all his labourers and materials. Any claim by his employees for the damages shall be settled by the contractor even action is against BHEL or to reimburse the legal expenses incurred by BHEL
37. Any action brought in by anybody on BHEL regarding patent, right etc., used by contractor in execution of work shall be defended by the contractor and /or reimburse to BHEL the cost of the same.
38. Contractor shall produce necessary records, documents, explanation whenever he is called upon to do, by any Government. Agencies like ESI, PF, VIGILANCE etc.,
39. **TERMS OF PAYMENT:** Payment will be made monthly on pro-rata basis (for STW/HAT it will be based on number Equipments/IOs/Systems tested during STW/HAT for each month and for SAT it will be based on number of mandays spent at sea onboard P71(IAC)) against your invoice after Satisfactory Services for each month. Attendance Record and Time sheet signed by Site-In-Charge / Customer to be attached along with the invoice.
40. **SECURITY DEPOSIT** Shall be as per Clause 1.9 of BHEL's GCC 2019
41. **REVERSE AUCTION:** Shall be as per Clause 2.22 of BHEL's GCC 2019

Contractor

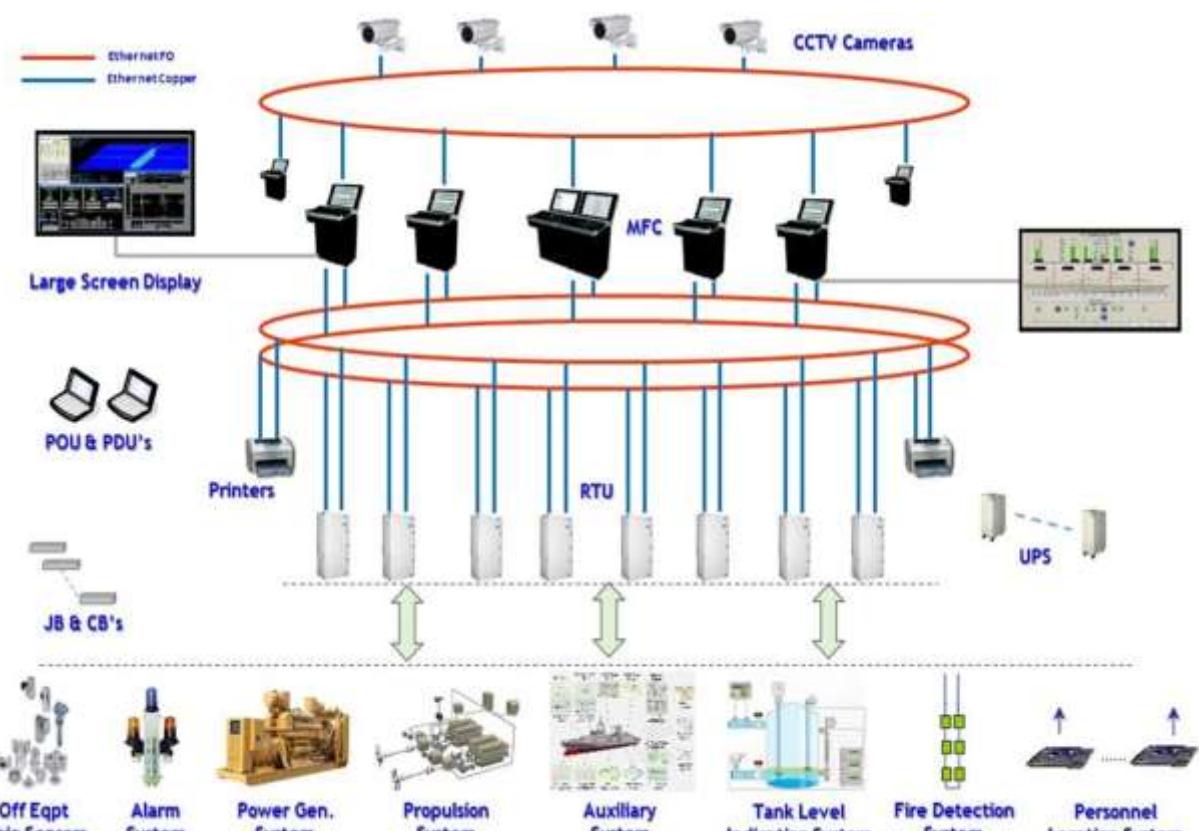
Page 13 of 68


Issuing Officer

SCOPE OF WORK:

1) TECHNICAL BRIEF OF IPMS:

IPMS is an open architecture distributed digital control system comprising of Remote Terminal Units (RTU), Multifunction console (MFCs) and redundant gigabit Ethernet network. RTUs are the central process level data acquisition and control units, whereas the Multifunction consoles provide Human Machine Interfaces (HMI) for the operators at various shipboard locations. System-wide connectivity is provided by a redundant fiber optic data bus. IPMS is able to maintain full operability of Controls from any Operator Station. IPMS is designed to ensure complete data integrity at field level. The comprehensive elaboration of each system is achieved by dedicated mimics. The mimics are customized and designed in accordance with the system functionality. The platform provides convenient and seamless end - user experience.



Typical Architecture Of An IPMS



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

2) SCOPE OF CONTRACT

Commissioning of IPMS supplied by BHEL-GE Avio for P71 (IAC) Ship of Indian Navy, being built at M/s Cochin Shipyard Limited, Cochin. The commissioning activity will involve carrying out STW, HAT and SAT of IPMS onboard P71(IAC), under supervision/guidance of BHEL/GE Avio (as and when required).

2.1 STW (Setting To Work):

STW of P71 IPMS involves the powering-up and carryout the functional checks of each of the IPMS main equipment onboard P71(IAC). It involves the following steps:

- Check that each of the equipment is installed correctly/properly and record the serial number
- Verify that the cable check has been carried out correctly/properly for each equipment and the cabinets/doors/panels are properly grounded
- Power ON each of the equipment and carry out its Functional Test as per the Test Procedure (refer Note below)
- However for the purpose of quoting details of the activities involved in STW is given at Annex-1

Note:

- All BHEL-GE Avio Procedures will be provided to the Sub-Contractor on whom BHEL awards the Commissioning Contract.
- However for the purpose of quoting details of the activities involved in HAT is given at Annex-1
- BHEL/GE Avio personnel are currently carrying out the STW and HAT activities of IPMS for P71(IAC). The exact quantities of Equipment/System for which STW and HAT has to be carried out by the Sub-Contractor will be indicated only during issue of Work Order on the Sub-Contractor on whom BHEL awards the Commissioning Contract.

STW will be carried out on each of the following IPMS main equipment installed onboard P71(IAC):

- Remote Terminal Units (RTU) - 60 nos.
- Multifunction Consoles (MFC)
 - 1 Bay DM MFC - 6 nos.

Contractor	Page 15 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- 2 Bay DM MFC - 6 nos.
- 3 Bay DM MFC - 8 nos.
- Wall Mounted Multifunction Console (WM MFC) - 11 nos.
- UPS (Uninterruptable Power Supplies) - 40 nos.
- Network system (Ethernet Switches & Routers) - 103 nos.
 - FO Loop-1 Test
 - FO Loop-2 Test
- Propulsion Emergency Order Telegraphs & Levers - 10 nos.
- Propulsion HW Panels - 3 nos.
- Diesel Alternator (DA) HW Panels - 2 nos.
- Overfill System - 2 nos.
- CCTV Cameras - 37 nos.
 - FO Loop-3 Test
- Fire Detection System Zonal Indication Panels (ZIP) - 9 nos.
- Engine Health Monitoring (EHM) System - 13 nos.
- Personnel Location System - 500 nos.
- Ship Sensors (comprising of about 2400 sensors) - 1 set
 - Sensor calibration
 - Sensor functional check
- Fire Detection System (comprising of about 3000 sensors) - 1 set
 - Check Sensor wiring and sequence of 54 Loops
 - Testing of 54 Loops of Sensors
- Portable Operator Units (POU & PDU) - 10 nos.
- Large Screen Display (LSD) - 5 nos.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- APMS Synchro Units - 24 nos.
- Tanks Level Indication - Local Display Unit (TLI-LDU) - 11 nos.
- Printer Cabinets - 3 sets
- Propulsion Junction Boxes - 2 nos.

2.2 HAT (Harbor Acceptance Test)

HAT will be carried onboard the ship, and the ship will be docked at the dockyard. HAT involves interfacing IPMS equipment with the actual machineries onboard P71(IAC) and carrying out the following for each of the onboard machineries/systems using the HMI:

- Hardwired I/O Channel Checks
- Soft I/O Channel Checks
- Functionality Checks

HAT will be performed on each of the following machineries onboard:

- i. APMS Auxiliaries
- ii. Main Switchboards
- iii. Electric Device Centres
- iv. Gas Turbines
- v. Reduction Gears
- vi. Controllable Propeller Pitch
- vii. Propulsion Auxiliaries
- viii. Hull Auxiliaries
- ix. Diesel Alternators
- x. AC Plant & Ref. Plant
- xi. Bilge System
- xii. Fire Main System
- xiii. FO Stripping
- xiv. Fresh Water System
- xv. Fuel Oil System
- xvi. HP Air Compressors



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- xvii. Machinery Ventilation System
- xviii. LP Air
- xix. Lube Oil System
- xx. Sea Water Cooling System
- xxi. Steering Gear System
- xxii. Hatches & Doors
- xxiii. Heeling & Trimming System
- xxiv. HVAC System
- xxv. Salvage Flooding
- xxvi. Salvage System
- xxvii. Ship Installed RADIAC System
- xxviii. Personnel Location System
- xxix. CCTV System
- xxx. Fire Fighting System
- xxxi. Citadel Pressure
- xxxii. Fire Detection System
- xxxiii. AVCAT System
- xxxiv. Hangar Systems
- xxxv. Nitrogen & Oxygen Plants
- xxxvi. Pre-Wetting System

Note:

- All BHEL-GE Avio Procedures will be provided to the Sub-Contractor on whom BHEL awards the Commissioning Contract.
- However for the purpose of quoting details of the activities involved in HAT is given at Annex-2
- BHEL/GE Avio personnel are currently carrying out the STW and HAT activities of IPMS for P71(IAC). The exact quantities of Equipment/System for which STW and HAT has to be carried out by the Sub-Contractor will be indicated only during issue of Work Order on the Sub-Contractor on whom BHEL awards the Commissioning Contract.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

2.3 SAT (Sea Acceptance Test)

SAT will involve a number of sea trials for validating the entire IPMS which also includes the Propulsion System for the following:

- Automatic sequences of the change-over
- Correct control of pitch and shaft speed according to the various combined laws

Note: All BHEL-GE Avio Procedures will be provided to the Sub-Contractor on whom BHEL awards the Commissioning Contract.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

2.3 Details Of Work Involved

BHEL/GE Avio personnel are currently carrying out the STW and HAT activities of IPMS for P71(IAC). The exact quantities of Equipment/System for which STW and HAT has to be carried out by the Contractor will be indicated only during issue of Work Order on the Sub-Contractor on whom BHEL awards the Commissioning Contract.

The representatives of the Sub-Contractor on whom the Contract will be awarded, will be trained by BHEL/GE Avio Personnel onboard P71(IAC). The representatives of the sub-contractor should get associated with BHEL/GE Avio Personnel, and get fully accustomed with BHEL/GE Avio commissioning methods and techniques during the 1st week of association/training. Subsequent to the association/training, they should be in a position to carry out the STW/HAT/SAT activities of IPMS independently at Onboard P71(IAC).

It is estimated that One Team is required for carrying out STW/HAT/SAT activities of IPMS onboard P71(IAC) for a period of 1 year. The team will comprise of 1 Engineer of Electrical & Electronics background and 2 Diploma Holders in Electrical & Electronics background. The Team will be familiar with Naval Control Systems and has experience in working at Dockyards, and they will be working under the supervision of BHEL personnel

STW/HAT/SAT should be carried out as per the guidelines/documentation given by BHEL/GE Avio.

All the Tools & Test equipment required for carrying out STW/HAT/SAT activities will be brought by the sub-contractor.

In case of any failure/faults in any of the IPMS Equipment during STW/HAT/SAT, the Team shall carry out rectification of the same under the guidance of BHEL-GE Avio Engineers.

Special care and attention be given to ensure that no damage is done to the equipment.

All activities carried out shall be followed by necessary Service Report indicating details of the work carried out.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

I) TOOLS, TACKLES AND MEASURING INSTRUMENTS:

All the necessary Tools, Tackles and Measuring Instruments required during STW/HAT/SAT are to be arranged by the contractor as and when required at no extra cost. List of recommended tools as per Annexure - A

II) PENALTY:

In the event of the representatives of contractor not attending to STW/HAT/SAT (for reasons not attributable to BHEL/Customer), a penalty of per day cost per person will be levied on the Contractor for each person for each day of absenteeism/non-working.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

ANNEXURE-A

LIST OF RECOMMENDED TOOLS/TEST EQUIPMENT FOR SERVICE

Sl. No.	Item Description
1	Digital Multimeter
2	Crimping Tool Set
3	Screw Driver Set
4	Spanner Set
5	Torque Wrench Set
6	Ratchet Set
7	Electric Screw Driver
8	Tubular Type Screw Driver Set
9	Adjustable Spanner
10	Extenders/Taparia/450mm,9",6",4",2",10" Length
11	Insulation Stripping Tool
12	Cable Tie Gun
13	Cable Cutter
14	Allen Key Set
15	Continuity Tester
16	Communication Equipment (Walkie-Talkie)
17	Industrial Safety Shoe With Steel Toe Cap & Pu Sole With ISI
18	Industrial Safety Helmet With Ratchet Type Fittings With ISI
19	Coverall (Colour Blue)



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

ANNEXURE-B

LABOUR COMPLIANCES

The Contractor shall employ labour in sufficient numbers to maintain the required progress schedule and quality to ensure workmanship of the degree specified in the contract and to the satisfaction of the Engineer-in-charge. The contractor shall not employ in connection with the works any person who has not completed his eighteen years of age or incapacitated by any means to work in connection with any part of this contract under any circumstances.

The Contractor shall furnish at the intervals specified, a distribution return of the number and description by trades of the workpeople employed on the works. The Contractor shall also submit on the 4th and 19th of every month a true statement showing in respect of the second half of the preceding month and the first half the current month (i) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them and (ii) the number of female workers who have been allowed maternity benefits as provided in the Maternity Benefit Act, 1961 or Rules made there under and the amount paid to them.

The Contractor shall pay to labour employed by him on or before 7th of every month wages not less than fair wages as defined in the Contractor's Labour Regulations, in the presence of the authorized personnel of BHEL, without linking the same to clearing of bills by BHEL.

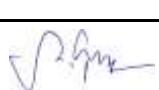
The Contractor shall in respect of labour employed by him comply with or cause to be complied with contractor's labour Regulations in regard to all matters provided therein.

The Contractor shall comply with the provisions of all the applicable laws, Central or State and in particular Factories Act 1948, Child Labour Prohibition Act 1986, Employer's Liability Act, 1938, Industrial Disputes Act 1947, Minimum Wages Act 1948, Payment of Wages Act 1936, Employee's Compensation Act 1923, Payment of Gratuity Act 1972, the Contract Labour [Regulation & Abolition] Act 1970, Payment of Bonus Act 1965, Income Tax Act 1961, Maternity Benefit Act 1961, Service Tax Rules & other Acts -Central or State and Rules, Regulations and Notifications by the concerned authorities thereto and amendments made thereunder from time to time along with other statutory obligations and relevant labour laws that may be applicable to him in relation to employment of his employees, payments etc.

The Contractor shall be liable to pay his contribution and the employees' contribution of the State Insurance Scheme in respect of all labour employed by him for the execution of the contract, in accordance with the provision of "The Employees, State Insurance Act, 1948," as amended from time to time. The Contractor shall apply to the ESI Authorities,

Contractor

Page 23 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

get himself registered with them and obtain a code Number. He shall pay the remittances towards PF under his Code Number only.

The Engineer-in-charge shall on a report having been made by an Inspecting Officer as defined in the Contractor's Labor Regulations have the power to require for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of workers, non-payment for wages or of deductions made from his or their wages which are not justified by the terms of the Contract of non-observance of the said Contractor's Labour Regulations

The liability for any compensation on account of injury sustained by an Employee of the contractor will be exclusively that of the contractor, and there should not be any liability on this account to BHEL.

The Officer-in-charge shall, on a report having been made by the inspecting Officer as defined in the Contractor's Labour Regulations, have the power to deduct from the moneys due to the contractor, any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of workers, non-payment of wages or of deductions made from his or their wages which are not justified by the terms of the contract or for non-observance of the said Contract Labour Regulations.

The Contractor shall be liable to pay all and any sum or sums that may become payable as contribution, compensation, penalty, fine or otherwise, under the provisions of law wherever applicable to or on behalf of any workmen employed by the contractor as may be demanded by any authority empowered under any of the above relevant Act. Any cost incurred by the Management of BHEL in connection with any claim or proceedings under the said Acts or in respect of loss, injury or improper performance of this contract by the contractor, his workmen, servant and any money which may become payable to the management of BHEL as aforesaid shall be deducted by the management of BHEL from any money due or accruing to the contractor.

If so applicable, the contractor shall apply & obtain license under the Contract Labour (R&A) Act 1970 and comply with the relevant provision of this Act, in respect of the labour employed by him for executing this contract. The contractor shall furnish necessary returns to the authority.

The Contractor shall also comply with the provisions of Employees' Provident Fund and Miscellaneous Provisions Act 1952 and Rules, Regulations and other Orders issued thereunder. The Contractor, as the employer, shall be liable to pay Employer contribution together with the Employee contribution (collected through deductions from monthly wages) towards PF in accordance with the provisions of the Employees' Provident Fund



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

and Miscellaneous Provisions Act, 1952, as amended from time to time, as an independent employer, in respect of all Security personnel deployed by him for the execution of this contract. He shall pay the remittances towards PF under his code Number only.

The contractor should obtain PF Registration if he has not obtained the same at the time of submitting the bid. He shall pay the remittances under his Code Number only.

The Contractor shall submit a copy of the PF contribution remittance challans and ECR copy bearing individual contribution details every month in respect of the personnel deployed by him at shed, along with bill of the subsequent month. The above documents are necessary for processing monthly bill.

The Contractor shall furnish to BHEL, copies of PF Returns as are due to be submitted to Authorities under the Act, for the entire contract period.

The Contractor shall be liable to pay Employer contribution and the Employee contribution of the Employees State Insurance Scheme in respect of employees employed by him, wherever applicable, as an independent employer for the execution of the contract, in accordance with the provisions of "The Employees State Insurance Act 1948," as amended from time to time.

If the Contractor has not obtained ESI registration at the time of submitting the bid, he shall apply to the ESI authorities, get himself registered and obtain a Code Number. He shall pay the remittances under his Code Number only.

The Contractor shall submit a copy of the ESI contribution remittance The Contractor shall produce necessary records, documents, and explanation whenever he is called upon to, by any Government Agencies like ESI, PF, Tax authorities, Vigilance etc. or by BHEL for whatsoever reasons.

The Contractor shall indemnify the BHEL against any payment to be made under and for observance of the Regulations aforesaid without prejudice to his right to claim indemnity from these sub-contractors.

In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid Labour Regulations, as amended from time to time or furnishing any information or submitting or filling any form/Register/Slip under the provisions of these Regulations which is materially incorrect, then on the report of the Inspecting Officers as defined in the concerned labour statutes, the Contractor shall without prejudice to any other liability pay to the BHEL a sum not exceeding Rs.50/- as liquidated damages for every default or breach or for furnishing, making, submitting, filling materially incorrect statement, as may be fixed by the identified BHEL personnel. The Contractor shall defend any case by



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

himself, if any action is brought in by such Government Agencies for non-compliance of any Labour Regulations and/or reimburse the expenses incurred by BHEL in this regard.

The Engineer-in-charge shall deduct such amount from bills or security deposit of the Contractor and credit the same to the welfare fund constituted under Regulations. The decisions of the Engineer-in-charge in this respect shall be final and binding.

MODEL RULES FOR LABOUR WELFARE

The Contractor shall at his own expense comply with or cause to be complied with model Rules for labor Welfare as appended to these conditions or rules framed by Government from time to time for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the Contractor fails to make arrangements as aforesaid the Engineer-in-charge shall be entitled do so and recover the cost thereof from the contractor.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

ANNEXURE-C

SAFETY CODE

RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT

1. Before commencing the work, contractor submit a "SAFETY PLAN" to the authorized BHEL Official. The 'Safety Plan' shall indicate in detail the measure that would be taken by the contractor to ensure safety of men, equipment, material and environment during execution of the work. The plan shall take care to satisfy all requirements specified hereunder. The contractor shall submit safety plan along with his offer. During negotiations before placing of work order and during execution of the contractor BHEL shall have right to review and suggest modification in the Safety Plan. Contractor shall abide by BHEL decision in this respect.
2. The contractor shall take all necessary safety precautions and arrange for appropriate appliances as per direction of BHEL or its authorized officials to prevent loss of human lives, injuries to personnel engaged, and damage to property and environment.
3. The contractor shall provide to its work force and ensure the use of the following personal protective equipment as found necessary and as directed by the authorized BHEL officials:-
 - i. Safety Helmets conforming to IS – 2925: 1984.
 - ii. Safety Belts conforming to IS – 3521: 1983.
 - iii. Safety Shoes conforming to IS – 1989: 1978.
 - iv. Eye and Face Protection devices conforming to IS – 8520: 1977 and IS – 8940: 1978.
 - v. Hand and body protection devices conforming to:
 - IS – 2573: 1975
 - IS – 6994: 1973
 - IS – 8807: 1978
 - IS – 8519: 1977.

All tools, tackles, lifting appliances, material handling equipment scaffolds, cradles, safety nets, ladders, equipments etc. used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them

Contractor	Page 27 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item.

All electrical equipment, connections and wiring for constructions power, its Distribution and use shall conform to the requirement of India Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carry out all types of electrical works. All electrical appliances including portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

The Contractor shall not use any hand – lamp energized by electric power with supply voltage of more than 24 Volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 Volts.

The contractor shall adopt all fire safely measures as laid down in the “Code for Fire Safety at Construction sites” issued by the Safety Department of the Construction management (HQ) of BHEL and as per directions of the authorized BHEL official. A copy of the above referred “Code of Fire Safety at Construction Sites” shall be made available by BHEL to the contractor for reference, on demand by the contractor, during tendering stage itself.

Where it becomes necessary to provide and/or store petroleum Products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provisions and/or storage in accordance with the rules and regulations laid down in the relevant government acts, such as Petroleum Act, Petroleum and Carbides of Calcium manual of the chief controller of Explosives, Govt. of India. etc., prior approval of the authorized BHEL official at the site shall also be taken by the contractor in all such matters.

The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working when natural daylight may not be adequate for clear visibility.

The contractor shall be held responsible for any violation of statutory regulations local, state or central and BHEL instructions, that may enrage safety of men, equipment, material and environment in his scope of work or another contractor’s or agency’s cost of damages if any, to life and property arising out of such violation of statutory regulations and BHEL instructions shall be borne by the contractor.

In case of a fatal or disabling injury accident to any person at construction sites due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL have the right to impose appropriate financial penalty on the contractor and recover the



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

same from payments due to the contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover cost of such damages from payments due to the contractor after holding an appropriate enquiry.

In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have right to recover cost of such delay from payments due to the contractor, after notifying the contractor suitably and giving him opportunity to present his case.

If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given a reasonable opportunity to do so; provide necessary safety devices and equipment or to carry out instructions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.

The contractor shall submit report of all accidents, fires and property damage, dangerous occurrence to the authorized BHEL official immediately after such occurrence, but in any case not later than twelve hours of the occurrence. Such reports shall be furnished in the manner prescribed by the contractor to the authorized BHEL official from time to time as prescribed.

Before commencing the work, the contractor shall appoint/nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

If Safety record of the contractor in execution of the awarded job is to the satisfaction of Safety Department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job.

Contractor	Page 29 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

ANNEXURE-D

ARBITRATION:

The parties shall attempt to settle any disputes or difference arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL-EDN. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.

It is term of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under clause together with the amount or amounts claimed in respect of each such dispute.

The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Bangalore.

The cost of arbitration shall be borne by the parties as decided by the Arbitrator upon him entering the reference.

Subject to the Arbitration Clause as above, the Courts at Bangalore alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract.

Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

Contractor	Page 30 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Electronic Funds Transfer (EFT)

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): CREATE
 CHANGE

BHEL Vendor / Supplier
Code:

(Filled by BHEL)

Company Name :

Permanent Account
Number(PAN):

Address

City:

—

PINCODE

E

—

STATE

—

—

Contact Person(s)

Telephone No:

Fax No:

e-mail id:

1 Bank Name:

2 Bank Address:

Contractor

Page 31 of 68

Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

3 Bank Telephone No:

4 Bank Account No:

5 Account Type:
Savings/Cash Credit

6 9 Digit Code Number of Bank and
branch appearing on MICR cheque
issued by Bank

7 Bank swift
Code(applicable for EFT
only)

8 Bank IFSC
code(applicable for
RTGS)

9 Bank IFSC
code(applicable for
NEFT)

A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account

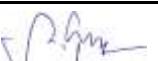
B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible

C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation

D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Contractor	Page 32 of 68	 Issuing Officer
------------	---------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Designation:

Telephone NO. with STD
Code

Company Seal

Bank Certificate

We certify that _____ has an Account No. _____
with us and we confirm that the bank details given above are correct as per our
records.

Date:

(.....)

Place:

Signature



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Annexure - I

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part-II) dtd:
Category: (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O. 1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs.....Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / Small (Strike off which is not applicable)
Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

Contractor

Page 34 of 68

Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

HEALTH, SAFETY & ENVIRONMENTAL POLICY

The Management is committed to be an environmentally sound company in its activities, products, services and to provide safe and healthy working environment covering its employees, products & services as an integral part of business performance through:

- ★ **Compliance with applicable Legislation and Regulations**
- ★ **Setting objectives and targets to eliminate / control / minimize environmental pollution, risks due to Occupational Health and Safety Hazards**
- ★ **Promotion of activities for conservation of resources by environmental management with focus on oil, electrical energy and chemicals**
- ★ **Enhancement of Environmental, Safety and Occupational Health awareness amongst employees, customers, suppliers, contractors by pro-active communication**
- ★ **Regular evaluation and pro-active measures for prevention & control of environmental pollution/accidents / occupational diseases**
- ★ **Appropriate training of employees and interested parties on Health, Safety & Environmental (HSE) aspects**
- ★ **Formulation and maintenance of HSE Management Programs for continual improvement**
- ★ **Periodic review & audit of HSE Management System to ensure its continuing suitability, adequacy and effectiveness**
- ★ **Communication of HSE Policy to all employees and interested parties**
- ★ **Co-operation with concerned agencies / regulatory bodies engaged in HSE activities.**

Sd.

EXECUTIVE DIRECTOR

BHEL (EDN) BANGALORE



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

PART II .Price Bid

DE/P71(IAC)/IPMS/COMM/2019/02

COMMISSIONING (STW/HAT/SAT) OF IPMS FOR P71(IAC)

Name Of BHEL Site: Onboard P71(IAC) At M/s Cochin Shipyard Ltd.

A) Offer For STW:

Sl. No.	Item Description	Qty (Nos.)	Unit Rate (Rs.)	GST (%)	Total With GST (Rs.)
	Remote Terminal Units (RTU)	60			
	Single Bay DM MFC	6			
	Two Bay DM MFC	6			
	Three Bay DM MFC	8			
	Wall Mounted MFC	11			
	UPS	40			
	Ethernet Switches / Routers	103			
	FO Loop-1 Test	1			
	FO Loop-2 Test	1			
	FO Loop-3 (CCTV Loop) Test	1			
	EOT/POT/Levers	10			
	Prop. HW Panels	3			
	DA HW Panels	2			
	Overfill System	2			
	CCTV Cameras	37			
	FDS - ZIP	9			
	EHM System	13			
	PLS - Tags	500			

Contractor	Page 36 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Sl. No.	Item Description	Qty (Nos.)	Unit Rate (Rs.)	GST (%)	Total With GST (Rs.)
	Off Equipment Sensors	3000			
	Fire Detection System	3000			
	FDS Sensor Wiring & Sequence Check	54 Loops			
	FDS Loop Checks	54 Loops			
	POU / PDU	10			
	Large Screen Display (LSD)	5			
	Synchro Units	24			
	TLIS – LDU	11			
	Printers With Cabinet (Sets)	3			
	Propulsion JBs	2			

Note: The exact quantities of Equipment/System for which STW has to be carried out by the L1 Sub-Contractor will be indicated only during issue of Work Order



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

B) Offer For HAT:

Sl. No.	Item Description	Qty (Nos.)	Unit Rate (Rs.)	GST (%)	Total With GST (Rs.)
A) Channel Check					
1	Hardwired IO Checks	8000			
2	Soft IO Checks	15000			
B) Functional Check					
1	Bilge System	1			
2	Firemain System	1			
3	Lube Oil System	1			
4	Sea Water Cooling System	1			
5	HP Air System	1			
6	LP Air System	1			
7	Steering Gear System	1			
8	Fresh Water System	1			
9	CITADEL Pressure System	1			
10	Fire Fighting System	1			
11	Salvage Flooding.	1			
12	AVCAT System	1			
13	Hanger System	1			
14	Fuel Oil Filling & Transfer System.	1			
15	CCTV System	1			
16	PLS System	1			
17	Heeling & Trimming System.	1			
18	Machinery Ventilation System	1			
19	Main Switch Board	1			
20	Energy Distribution Centre	1			

Contractor

Page 38 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Sl. No.	Item Description	Qty (Nos.)	Unit Rate (Rs.)	GST (%)	Total With GST (Rs.)
21	Diesel Alternator	1			
22	Gas Turbine	1			
23	APMS Auxiliaries	1			
24	Fuel Oil Stripping System	1			
25	Hatches And Doors	1			
26	Hull Auxiliaries	1			
27	Propulsion Support System	1			
28	Controllable Pitch Propeller	1			
29	Reduction Gear System	1			
30	AC And Ref Plant	1			
31	Salvage System	1			
32	Various Type Of Sensors				
a	Level Transmitters/Draft Sensors	175			
b	Level Switches/Flood Sensors	1026			
c	Pressure Switches	89			
d	Pressure Transmitters	278			
e	Temperature Transmitters	3			
f	Proximity Sensor – Doors & Hatches	687			
g	Flow Switches	19			
h	Flow Transmitters	8			
i	Electrical Inclinometer	2			

Note: The exact quantities of IOs to be Checked and the quantities of Equipment/System for which HAT has to be carried out by the L1 Sub-Contractor will be indicated only during issue of Work Order

Contractor	Page 39 of 68	
------------	---------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

C) Offer For SAT:

Sl. No. (1)	Item Description (2)	Qty. (3)	Unit Rate (Rs.) (4)	GST (%) (5)	Total (Rs) (6)
01	Engineer's Per Man-Day Cost For Sailing In The Sea Onboard P71(IAC)				
02	Diploma Holder's Per Man-Day Cost For Sailing In The Sea Onboard P71(IAC)				
TOTAL AMOUNT (IN FIGURES) Please mention tax breakup clearly					

TOTAL AMOUNT (IN WORDS)

Note:

- 1) Invoice to be provided for tax amount claimed

Contractor	Page 40 of 68	
------------	---------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Annex-1

Details Of STW Activities

The main purpose of IPMS STW is to ensure data acquiring and supervision functionality, connectivity and availability of each components in the network. Considering the project time lines multiple teams will be deployed for various sub process/phases for IPMS STW with necessary OEM support as required. Indicative procedure for carrying out STW of each of the IPMS equipment is described as follows:

1) STW Of UPS

To check the installation of the UPS and the correct connections of the diagnostic signal to the RTUs. The test procedures cover the equipment Power ON functionality trials but not the endurance and load test. The following checks are required to be carried out:

- a) Check that the UPS is installed properly
- b) Verify that the Cable check (continuity and insulation checks) has been completed
- c) Check if the UPS is cleaned after the cabling works
- d) Check that input Power Supply is available for the UPS
- e) Check whether the UPS Cabinet / doors / panels is properly grounded
- f) Power ON the UPS and check whether the UPS delivers the required output.

2) STW Of Network Switch

- a) Check that the Network Switch Enclosure is installed properly
- b) Verify that the Cable check (continuity and insulation checks) has been completed
- c) Verify that the FO Cable check (continuity checks) has been completed
- d) Check if the Network Switch Enclosure is cleaned after the cabling works
- e) Check that input Power Supply is available for the Network Switch Enclosure
- f) Check whether the Network Switch Enclosure Cabinet / doors / panels is properly grounded
- g) Verify that the interconnections between the Network Switch Enclosure, DA Router and its internal connections are as per the STW document
- h) Verify that the corresponding UPS is available as per Network & UPS Wiring

Contractor	Page 41 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

diagram

3) STW Of Network Loop:

a) LOOP 1 - Network Switches Detection:

- i. Connect a PDU (Portable Diagnostic Unit) to one of the 100 Mbps Ethernet port of a convenient Network Switch enclosure of the Loop 1.
- ii. Disconnect one of the Fibre Optic connection from the same Network Switch where the PDU is connected.
- iii. Run a DOS session (cmd.exe) and set the command “ping 191.1.0.xxx – t” and verify that the relevant Network Switch replies.
- iv. Reconnect the Fibre Optic connection.
- v. Run the MXview software, browse the loop and verify that the topographic sequence of the Network Switch in the ring match with the network Single Line Diagram

b) LOOP 2 - Network Switches Detection:

- i. Connect a PDU (Portable Diagnostic Unit) to one of the 100 Mbps Ethernet port of a convenient Network Switch enclosure of the Loop 2.
- ii. Disconnect one of the Fibre Optic connection from the same Network Switch where the PDU is connected.
- iii. Run a DOS session (cmd.exe) and set the command “ping 191.1.0.xxx – t” and verify that the relevant Network Switch replies.
- iv. Reconnect the Fibre Optic connection.
- v. Run the MXview software, browse the loop and verify that the topographic sequence of the Network Switch in the ring match with the network Single Line Diagram

c) CCTV LOOP - Network Switches Detection:

- i. Connect a PDU (Portable Diagnostic Unit) to one of the 100 Mbps Ethernet port of a convenient Network Switch enclosure of the CCTV Loop.
- ii. Disconnect one of the Fibre Optic connection from the same Network Switch where the PDU is connected.
- iii. Run a DOS session (cmd.exe) and set the command “ping 191.1.0.xxx –

Contractor	Page 42 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

t" and verify that the relevant Network Switch replies.

- iv. Reconnect the Fibre Optic connection.
- v. Run the MXview software, browse the loop and verify that the topographic sequence of the Network Switch in the ring match with the network Single Line Diagram

4) STW Of MFC

- a) Check that the MFC is installed properly
- b) Verify that the Cable check (continuity and insulation checks) has been completed
- c) Verify that the FO Cable check (continuity checks) has been completed
- d) Check if the MFC is cleaned after the cabling works
- e) Check that input Power Supply is available for the MFC
- f) Check whether the MFC Cabinet / doors / panels is properly grounded
- g) Verify that the interconnections between the MFC, Network Switch, UPS and its internal connections are as per the STW document
- h) Perform the following checks on the MFC (Multi-Function Console):
 - i. Power ON the MFC
 - ii. Verify its name
 - iii. Verify that the monitors are working and the secondary monitor works as desktop extension of the primary monitor
 - iv. Trackball and keyboard are working
 - v. Loop 1 Connection Check: Run a DOS session (cmd.exe) and set the command "ping 191.1.0.71 -t" and verify that the switch reply
 - vi. Loop 2 Connection Check: Run a DOS session (cmd.exe) and set the command "ping 191.1.0.71 -t" and verify that the switch reply
 - vii. CCTV Loop Connection Check: Run a DOS session (cmd.exe) and set the command "ping 191.1.0.71 -t" and verify that the switch reply
 - viii. Check from the Windows "Control Panel/ Programs" that the "IPMS Multi-Function Console" version is 3.85 or higher
 - ix. Verify that the Configuration Files are installed as described in the referenced document VDD24954 [12]



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- x. Verify that the MFC Miscellaneous Support Software Library are installed as described in the referenced document VDD25201

5) STW Of Elaboration Unit

- a) Check that the Elaboration Unit is installed properly (Elaboration Unit – 1 is housed inside MFC-07 and Elaboration Unit – 2 is housed inside MFC-09)
- b) Verify that the Cable check (continuity and insulation checks) has been completed for that MFC
- c) Verify that the FO Cable check (continuity checks) has been completed for that MFC
- d) Check if the MFC is cleaned after the cabling works
- e) Check that input Power Supply is available for the MFC
- f) Check whether the MFC Cabinet / doors / panels is properly grounded
- g) Verify that the interconnections between the MFC, Network Switch, UPS and its internal connections are as per the STW document
- h) Perform the following checks for the Elaboration Unit:
 - i. Remove the EU1 power cord 1
 - ii. Remove the EU2 power cord 1
 - iii. Power on the EU1.
 - Power on the MFC 07 and, once the OS has started, establish a remote connection using the following parameter:
 - IP address. = XXXXXXXX
 - User = XXXXXXXX
 - Password = XXXXXXXX
 - Verify that the remote connection is established.
 - iv. Power on the EU2.
 - From the remote connection run a PowerShell session and set the command “ping XXXXXXXX” and verify that the EU2 reply
 - v. Set the command “ping XXXXXXXX” and verify that the EU1 reply.
 - vi. Set the command “ping XXXXXXXX” and verify that the EU2 reply.
 - vii. Set the command “ping XXXXXXXX” (Sync 1 port) and verify that the EU2 reply.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- viii. Set the command “ping 191.6.0.191” (Sync 2 port) and verify that the EU2 reply.
- ix. Set the command “ping XXXXXXXX” (VLAN PLS L1 port) and verify that the EU2 reply.
- x. Set the command “ping XXXXXXXX” (VLAN PLS L2 port) and verify that the EU2 reply.
- xi. On EU1, plug the power cord 1 and remove the power cord 2. Verify that the EU1 is still running
- xii. On EU2, plug the power cord 1 and remove the power cord 2. Set the command “ping XXXXXXXX” and verify that the EU2 reply.
- xiii. From the remote connection run the SANsymphony-V program. Select the EU1“Virtual Disks” tab and verify that the CCTVDisk status in “Up to date” or in progress and the percentage of the progress is shown.
- xiv. Verify that the EHMDisk disk status in “Up to date” or in progress and the percentage of the progress is shown.
- xv. Verify that the OBTSDisk disk status in “Up to date” or in progress and the percentage of the progress is shown.
- xvi. Verify that the PLSDisk disk status in “Up to date” or in progress and the percentage of the progress is shown.
- xvii. Verify that the Witness disk status in “Up to date” or in progress and the percentage of the progress is shown.
- xviii. Select the EU2“Virtual Disks” tab and verify that the CCTVDisk status in “Up to date” or in progress and the percentage of the progress is shown.
- xix. Verify that the EHMDisk disk status in “Up to date” or in progress and the percentage of the progress is shown.
- xx. Verify that the OBTSDisk disk status in “Up to date” or in progress and the percentage of the progress is shown.
- xxi. Verify that the PLSDisk disk status in “Up to date” or in progress and the percentage of the progress is shown
- xxii. Verify that the Witness disk status in “Up to date” or in progress and the percentage of the progress is shown.

6) STW Of LSD (Large Screen Display)

- a) Check that the LSD is installed properly



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- b) Verify that the Cable check (continuity and insulation checks) has been completed
- c) Check if the LSD is cleaned after the cabling works
- d) Check that input Power Supply is available for the LSD
- e) Check whether the LSD is properly grounded
- f) Verify that the interconnections between the LSD, MFC, Network Switch, UPS and its internal connections are as per the STW document
- g) Power ON the LSD and verify that the Windows desktop extension is shown

7) STW Of RTU (Remote Terminal Unit)

- a) Check that the RTU is installed properly
- b) Verify that the Cable check (continuity and insulation checks) has been completed
- c) Check if the RTU is cleaned after the cabling works
- d) Verify that the cable check has been executed for each field JB's and they are properly grounded
- e) Check whether the RTU is properly grounded
- f) Check that input Power Supply is available for the RTU
- g) Verify that the interconnections between the RTU, MFC, Network Switch, UPS and its internal connections are as per the STW document
- h) Verify that the RTU is connected to the Loop 1 and Loop 2
- i) The following checks can be executed from one MFC connected to the network:
 - i. Power on the RTU and, once the boot sequence is over, verify from the MFC "SW version" diagnostic page that the RTU SW version is "B" or higher.
 - ii. LOOP 1 connection: Run a DOS session (cmd.exe) and set the command "ping 191.1.0.1 -t" and verify that the RTU reply.
 - iii. LOOP 2 connection: Run a DOS session (cmd.exe) and set the command "ping 191.1.0.1 -t" and verify that the Switch reply.
 - iv. Verify in the relevant RTU HARDWARE OVERVIEW mimic the following:
 - v. VENTILATION warning ok
 - vi. TEMPERATURE warning ok

Contractor	Page 46 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- vii. FIELD PSU warning ok
- viii. RACK FAIL alarm ok
- ix. DIDO 1 Card warning ok
- x. DIDO 1 Output warning ok
- xi. DIDO 2 Card warning ok
- xii. DIDO 2 Output warning ok
- xiii. DIDI 1 Card warning ok
- xiv. DIDI 2 Card warning ok
- xv. Alao 1 Card warning ok

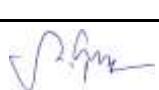
8) STW Of ZIP (Zonal Indication Panel)

- a) Check that the ZIP is installed properly
- b) Verify that the Cable check (continuity and insulation checks) has been completed
- c) Check if the ZIP is cleaned after the cabling works
- d) Check whether the ZIP is properly grounded
- e) Check that input Power Supply is available for the ZIP
- f) Verify that the interconnections between the ZIP, Network Switch, UPS and its internal connections are as per the STW document
- g) Verify that the ZIP is connected to the Loop 1 and Loop 2
- h) The following checks can be executed from one MFC connected to the network:
 - i. Power on the supply line 1 and verify, from the panel diagnostic overview mimic, that the ZIP 1 lamp is green.
 - ii. LOOP 1 connection: Run a DOS session (cmd.exe) and set the command "ping 191.1.1.160 -t" and verify that the RTU reply.
 - iii. LOOP 2 connection: Run a DOS session (cmd.exe) and set the command "ping 191.2.1.160 -t" and verify that the switch reply.
 - iv. Power on the supply line 2 and switch on the supply line 1, verify from the diagnostic overview mimic, that the ZIP 1 lamp is green.

9) STW Of Sensors

Contractor

Page 47 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- a) Check that the following Sensors are installed properly
 - i. Flood Sensors
 - ii. Door & Hatch Proximity Switches
 - iii. Tank Level Sensors
 - iv. Zener Barriers
- b) Verify that the interconnections between the Sensors, JBs, RTUs, Network Switches, MFCs and UPSs are as per the STW document

10) STW Of Overfill Panels

- a) Check that the Overfill Panels are installed properly
- b) Check whether the Overfill Panels are properly grounded
- c) Verify that the interconnections between the Overfill Panels, JBs, RTUs, Network Switches, MFCs and UPSs are as per the STW document

11) STW Of Equipment Health Monitoring System

- a) Check that the Equipment Health Monitoring System (DAUs and Accelerometers) are installed properly
- b) Check whether the DAUs are properly grounded
- c) Verify that the interconnections between the Accelerometers, DAUs, JBs, RTUs, Network Switches, MFCs and UPSs are as per the STW document
- d) The following checks can be executed from one MFC connected to the network:
 - i. The DAU is connected to Loop1 and Loop2.
 - ii. By means of simulating the vibration transducer and simulating a vibration value, verify that the channels are properly acquired.
 - iii. The channel functionality trials consist of the following steps:
 - Disconnect the transducer and connect the signal generator set as follows:
 - Shape: Sine
 - Frequency: 100 Hz
 - Level: 100 mV rms
 - Select from the MFC/POU the HMI page “EHM / Vibration”. Read the vibration values from the “SYN-OPTIC” tab.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- Signals of 45 Channels have to be checked

12) STW Of Portable Operator Unit and Data Connection Port

- The POU SETTING TO WORK checks consists to verify, the following for each POU:
 - Power on the unit
 - Verify the POU name
 - Check from the Windows “Control Panel / Programs” that the “IPMS MultiFunction Console” version is 3.85 or higher.
 - Verify that the Configuration Files as described in the referenced document VDD24954 [12] are installed.
 - Verify that the MFC Miscellaneous Support Software Library as described in the referenced document VDD25201 [13] are installed.
- Data Connection Port Setting To Work involves connecting one POU unit to the Data Port under test and ping the three networks
 - LOOP 1 Connection: Run a DOS session (cmd.exe) and set the command “ping 191.1.0.71 –t” and verify that the switch reply.
 - LOOP 2 Connection: Run a DOS session (cmd.exe) and set the command “ping 191.1.0.71 –t” and verify that the switch reply.
 - CCTV LOOP Connection: Run a DOS session (cmd.exe) and set the command “ping 191.1.0.71 –t” and verify that the switch reply.

13) STW Of Printers

- Check that the Printers are installed properly & grounded
- Verify that the printer consumable (ink cartridges and paper) are installed
- Verify that the interconnections between the Printers, Network Switches, MFCs and UPSs are as per the STW document
- Verify that the Printer is connected to the Loop 1 and Loop 2
- The following checks can be executed from one MFC connected to the network:
 - Check from the Windows “Control Panel / Devices and Printers” that the corresponding Printer is installed
 - Right click on the printer and select “Printer Properties”. Set a “Print Test Page” command.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

iii. The above check has to be carried out from each of the 31 of MFCs and 6 of POUs, for each of the six Printers.

14) STW Of DA Hardware Panels

- Check that the DA Hardware Panels are installed properly & grounded
- Verify that the interconnections between the DA Hardware Panels, RTUs, Network Switches, MFCs and UPSs are as per the STW document

15) STW Of APMS Synchro Units

- Check that the Synchro Units are installed properly & grounded
- Verify that the interconnections between the Synchro Units, RTUs, Network Switches, MFCs and UPSs are as per the STW document

16) STW Of Tank Level Local Display

- Check that the Tank Level Local Displays are installed properly & grounded
- Verify that the interconnections between the Tank Level Local Displays, RTUs, Network Switches, MFCs and UPSs are as per the STW document
- The following checks to be carried out on each of the 11 of Tank Level Local Displays:
 - Power on the LDU and verify that the measures and alarms status of each of the Tanks connected to that LDU are coherent with the values shown in the IPMS HMI pages.

17) STW Of IPMS Network & Serial Links

- This is to check the IPMS Network functionality
- The checks cover the various network testing scenarios.
- The following test will involve all the RTUs.
- Two RTUs (RTU39 as master and RTU43 as secondary) are dedicated to the management of the summary alarms
- The test must be carried out one time with the RTU39 ON and a second time with RTU43 ON and the RTU39 OFF.
- RTU39 Management [RTU39 ON & RTU43 OFF]
 - Set the network connections as follows and then do the Acknowledgement of the alarms.

Contractor	Page 50 of 68	
------------	---------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Connection	Status
P_ETH1	Plugged
P_ETH2	Plugged

ii. Perform the following test:

Connection	Status	HMI Alarm Page	RTU Hardware Overview	Pass/Fail
P_ETH1	Unplugged	Alarm	Alarm	
P_ETH2	Unplugged	Alarm	Alarm	

iii. The above checks have to be carried out on each of the RTUs.

g) RTU43 Management [RTU43 ON & RTU39 OFF]

i. Set the network connections as follows and then do the Acknowledgement of the alarms.

Connection	Status
P_ETH1	Plugged
P_ETH2	Plugged

ii. Perform the following test:

Connection	Status	HMI Alarm Page	RTU Hardware Overview	Pass/Fail
P_ETH1	Unplugged	Alarm	Alarm	
P_ETH2	Unplugged	Alarm	Alarm	

iii. The above checks have to be carried out on each of the RTUs.

h) Serial Connectivity Test

i. The purpose of this test is to functionally provide the serial connectivity to each RTU. As already well defined ICD (Interface Control Document) is available for each of the equipment, the test shall be used to validate the interface only.

ii. Two RTUs are dedicated for the management of the summary alarms

iii. RTU39 as master and the RTU44 as secondary (in case of unavailability of the master).

Contractor	Page 51 of 68	
------------	---------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- iv. The test must be done one time with the RTU39 ON and a second time with the RTU43 ON and the RTU39 OFF.
- v. The test procedure is divided grouping homogeneous signals in accordance with the hypothetical mimics.
- vi. For the indication/alarm of the corresponding system test Pass/Fail the "serial link overview mimic & RTU Hardware overview" may be checked.
- vii. Set the Serial Link connections and then do the Acknowledgement of the Alarms for the following Systems
 - TLI LDU
 - ICCP
 - HP Compressors
 - Centrifuges
 - VCS (Hydraulic, Pneumatic and Electrical)
 - HVAC Zonal Control Panels
 - Steering
 - DA Supply Breaker
 - Gearbox GCU
 - Telegraph Lever System
 - RTU18 COM1 Test
 - RTU18 COM3 Test
 - RTU20 COM1 Test
 - RTU18 COM2 Test

i) Serial Connectivity Test

- i. The purpose of this test is to functionally provide the Ethernet Connectivity to each RTU. As already well defined ICD (Interface Control Document) is available for each of the equipment, the test shall be used to validate the interface only.
- ii. Set the Ethernet Link connections and then do the Acknowledgement of the Alarms for the following Systems
 - A/C Plant
 - REF PLANT

Contractor	Page 52 of 68	
------------	---------------	--



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- EDC
- Main Switch Board
- DA
- AVCAT
- GT ECU
- PLMS Readers

j) MFC Network Overview

- i. This test involves all RTUs.
- ii. Two RTUs are dedicated for the management of the summary alarms
- iii. RTU39 as master and the RTU43 as secondary (in case of unavailability of the master).
- iv. The test must be done one time with the RTU39 ON and a second time with the RTU43 ON and the RTU39 OFF.
- v. With RTU39 ON and RTU43 OFF, set the Network connections and then do the Acknowledgement of the Alarms for each of the 31 MFCs.
- vi. With RTU43 ON and RTU39 OFF, set the Network connections and then do the Acknowledgement of the Alarms for each of the 31 MFCs.



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Annex-2

Details Of HAT Activities

HAT of IPMS for P71(IAC) involves the following:

- Channel Checks
 - Hardwired IO Checks
 - Soft IO Checks
- Functional Checks

A) Channel Checks:

Channel Checks involve testing of each of the IOs (Hardwired & Soft IOs). All the IOs have to be connected to the Field Equipment/Sensor/Actuators. Wherever Field Equipment/Sensor/Actuators are not available, the IO Channel Check will be carried out by Simulating the IO at the equipment end and the coherence with the IPMS status must be checked.

- **Digital Input Signals:** IPMS status must be coherent with signal stimulated at equipment end
- **Digital Output Signals:** IPMS command must be coherent with equipment expected status (e.g. command Start = +24Vdc present till feedback active or timeout expired)
- **Analogue Input Signals:** IPMS reading must be coherent with signal (within OEM range) at equipment end.
- **Analogue Output Signals:** IPMS driven command must be coherent with equipment expected range.

Any discrepancy between the IPMS and equipment behaviours must be considered as a deviation from the agreed documents.

The total list of IOs (Hardwired & Soft IOs) are as given below:

Sl. No.	System	HW IOs	Serial IOs
1	AFC	122	446
2	APMS	4,390	7,307
3	Auxiliary	1,667	2,600



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

Sl. No.	System	HW IOs	Serial IOs
4	BDCS	1,563	5,738
5	Diagnostics	853	0
6	EHM	53	0
7	Hull Auxiliary	57	78
8	Propulsion	1,295	1,200
Total		10,000	17,369

B) Functional Checks:

The objective is to check the Control & Monitoring functionality of each of the sub-systems of IPMS. All the possible commands and automatic functions will be tested in order to check if the configuration parameters are properly implemented, i.e.

- START/STOP or OPEN/CLOSE command timeouts
- Automatic sequences

For all the equipment where only monitoring is required (the functionality coincides with the channel check test), performing Functional Checks is not considered necessary.

The Control & Monitoring functionality checks shall be carried out as follows for each of the following sub-systems of IPMS:

1) Bilge System & Oily Water Separator

- a) FWD VCS Manual Control (11 Valves; 3 Pumps)
- b) AFT VCS Manual Control (14 Valves; 3 Pumps)
- c) Oily Water Separator Manual Control (2 OWS)
- d) FWD Automatic Sequences
- e) AFT Automatic Sequences

2) Firemain System

- a) Firemain Valves DCHQ-1 (73 Valves)
- b) Firemain Pumps DCHQ-1 (20 Pumps)



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- c) Firemain Valves DCHQ-2 (73 Valves)
- d) Firemain Pumps DCHQ-2 (20 Pumps)

3) Lub Oil System

- a) FDA Emergency Stop
- b) FER Emergency Stop
- c) ADA Emergency Stop
- d) AER Emergency Stop
- e) CPP Room Emergency Stop

4) Sea Water Cooling System

- a) FWD VCS Manual Control (3 Valves; 3 Pumps)
- b) AFT VCS Manual Control (5 Valves; 3 Pumps)

5) HP Air System

Since the HP Air Compressors parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

6) LP Air System

- a) Compressor 1 (FDA)
- b) Compressor 2 (FER)
- c) Compressor 3 (ADA)
- d) Compressor 4 (AEA)

7) Steering Gear

Since the Steering Gear parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

8) Fresh Water System

- a) EVC 1 Valves (25 Valves)
- b) EVC 1 Valves (25 Valves)
- c) RO Plants (7 RO Plants)



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- d) FW Pumps (10 Pumps)

9) CITADEL Pressure System

Since the CITADEL Pressure System parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

10) Fire Fighting System

- a) Galley Fire Fighting System
- b) Paint Store Fire Fighting System

Since the Fire Fighting System parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

11) Salvage Flooding System

Since the Salvage Flooding System parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

12) AVCAT System

- a) FWD AVCAT (9 Valves; 9 Pumps)
- b) AFT AVCAT (7 Valves; 9 Pumps)

13) Hanger System

- a) FWD (2 Scenarios)
- b) AFT (2 Scenarios)
- c) Turntable (Nil)
- d) Ammunition Lift (5 Lifts)

14) Fuel Oil Filling & Transfer System

- a) FWD VCS Valves Manual Control (46 Valves)
- b) FWD VCS Valves Emergency Closure (130 Valves)
- c) FWD VCS Pumps Manual Control (5 Pumps)
- d) AFT VCS Valves Manual Control (41 Valves)
- e) AFT VCS Valves Emergency Closure (124 Valves)



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- f) AFT VCS Pumps Manual Control (5 Pumps)
- g) Centrifuges Emergency Stop (4 Centrifuge)
- h) Transfer Automatic Sequences
- i) RAS Filling Automatic Sequences
- j) RU Filling Automatic Sequences

15) CCTV System

a) 37 Cameras

- Loop Connection
- Live View
- PTZ Command
- Panel View
- Playback View

16) PLS

Each of the PLS (74) will be tested for the following:

- a) Loop Check
- b) Antenna # 1 Detection
- c) Antenna # 2 Detection

17) Heeling and Trimming System

- a) SB2 - FWD H&T Manual Control (19 Valves; 4 Pumps)
- b) SB2 – MID H&T Manual Control (39 Valves; 9 Pumps)
- c) SB2 – AFT H&T Manual Control (12 Valves; 2 Pumps)
- d) SB5 - FWD H&T Manual Control (19 Valves; 4 Pumps)
- e) SB5 - MID H&T Manual Control (38 Valves; 9 Pumps)
- f) SB5 - AFT H&T Manual Control (12 Valves; 2 Pumps)
- g) Automatic Sequences Section Base 2
 - i. FWD Room 1 Tanks (8 Tanks)
 - ii. FWD Room 2 Tanks (6 Tanks)
 - iii. MID FER Tanks (6 Tanks)

Contractor	Page 58 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- iv. MID AER Tanks (6 Tanks)
- v. AFT Tanks (6 Tanks)
- h) Automatic Sequences Section Base 5
 - i. FWD Room 1 Tanks (8 Tanks)
 - ii. FWD Room 2 Tanks (4 Tanks)
 - iii. MID FER Tanks (6 Tanks)
 - iv. MID AER Tanks (5 Tanks)
 - v. AFT Tanks (6 Tanks)

18) Machinery Ventilation System

- a) Fans (127 nos.)
- b) NBCD Plant (114 nos.)
- c) Dampers (185 nos.)
- d) Emergency Stop (57 nos.)

19) Main Switchboard

- a) DA Breakers Functionality Trials
 - i. DA1 Breaker Manual Control (4 Scenarios)
 - ii. DA2 Breaker Manual Control (4 Scenarios)
 - iii. DA3 Breaker Manual Control (4 Scenarios)
 - iv. DA4 Breaker Manual Control (4 Scenarios)
 - v. DA5 Breaker Manual Control (4 Scenarios)
 - vi. DA6 Breaker Manual Control (4 Scenarios)
 - vii. DA7 Breaker Manual Control (4 Scenarios)
 - viii. DA8 Breaker Manual Control (4 Scenarios)
- b) Busbar Breakers Functionality Trials
 - i. BB 5N Breaker (Critical) Manual Control (3 Scenarios)
 - ii. BB 5N Breaker (Split) Manual Control (3 Scenarios)
 - iii. BB 6K Breaker (Critical) Manual Control (3 Scenarios)
 - iv. BB 6K Breaker (Split) Manual Control (3 Scenarios)



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- v. BB 6P Breaker (Critical) Manual Control (3 Scenarios)
- vi. BB 6P Breaker (Split) Manual Control (3 Scenarios)
- vii. BB 6R Breaker (Critical) Manual Control (3 Scenarios)
- viii. BB 6R Breaker (Split) Manual Control (3 Scenarios)
- ix. IB 5N6K Breaker (Critical) Manual Control (3 Scenarios)
- x. IB 5N6K Breaker (Split) Manual Control (3 Scenarios)
- xi. IB 5N6P Breaker (Critical) Manual Control (3 Scenarios)
- xii. IB 5N6P Breaker (Split) Manual Control (3 Scenarios)
- xiii. IB 5N6R Breaker (Critical) Manual Control (3 Scenarios)
- xiv. IB 5N6R Breaker (Split) Manual Control (3 Scenarios)
- xv. BB 6K5N Breaker (Critical) Manual Control (3 Scenarios)
- xvi. BB 6K5N Breaker (Split) Manual Control (3 Scenarios)
- xvii. BB 6K6P Breaker (Critical) Manual Control (3 Scenarios)
- xviii. BB 6K6P Breaker (Split) Manual Control (3 Scenarios)
- xix. BB 6K6R Breaker (Critical) Manual Control (3 Scenarios)
- xx. BB 6K6R Breaker (Split) Manual Control (3 Scenarios)
- xxi. BB 6P5N Breaker (Critical) Manual Control (3 Scenarios)
- xxii. BB 6P5N Breaker (Split) Manual Control (3 Scenarios)
- xxiii. BB 6P6K Breaker (Critical) Manual Control (3 Scenarios)
- xxiv. BB 6P6K Breaker (Split) Manual Control (3 Scenarios)
- xxv. BB 6P6R Breaker (Critical) Manual Control (3 Scenarios)
- xxvi. BB 6P6R Breaker (Split) Manual Control (3 Scenarios)
- xxvii. BB 6R5N Breaker (Critical) Manual Control (3 Scenarios)
- xxviii. BB 6R5N Breaker (Split) Manual Control (3 Scenarios)
- xxix. BB 6R6K Breaker (Critical) Manual Control (3 Scenarios)
- xxx. BB 6R6K Breaker (Split) Manual Control (3 Scenarios)
- xxxi. BB 6R6P Breaker (Critical) Manual Control (3 Scenarios)
- xxxii. BB 6R6P Breaker (Split) Manual Control (3 Scenarios)

c) Shore Supply Breakers Functionality Trials



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- i. Shore Breaker SH 1 Manual Control (3 Scenarios)
- ii. Shore Breaker SH 2 Manual Control (3 Scenarios)
- iii. Shore Breaker SH 3 Manual Control (3 Scenarios)
- iv. Shore Breaker SH 4 Manual Control (3 Scenarios)
- v. Shore Breaker SH 5 Manual Control (3 Scenarios)
- vi. Shore Breaker SH 6 Manual Control (3 Scenarios)
- vii. Shore Breaker SH 7 Manual Control (3 Scenarios)
- viii. Shore Breaker SH 8 Manual Control (3 Scenarios)

d) MSB Feeders Functionality Trials

- i. MSB 5N – N1 Section Feeders (30 Feeders)
- ii. MSB 5N – N2 Section Feeders (30 Feeders)
- iii. MSB 6K – K1 Section Feeders (30 Feeders)
- iv. MSB 6K – K2 Section Feeders (30 Feeders)
- v. MSB 6P – P1 Section Feeders (30 Feeders)
- vi. MSB 6P – P2 Section Feeders (30 Feeders)
- vii. MSB 6R – R1 Section Feeders (30 Feeders)
- viii. MSB 6R – R2 Section Feeders (30 Feeders)

e) MSB Preferential Trip Functionality

- i. PORT Preferential Trip (3 Trips)
- ii. STBD Preferential Trip (3 Trips)

f) Automatic Sequences

- i. PORT – Overload / Underload Sequence (4 DAs)
- ii. STBD – Overload / Underload Sequence (4 DAs)
- iii. PORT – Standby Start For Alarm (4 DAs)
- iv. STBD – Standby Start For Alarm (4 DAs)
- v. PORT – Blackout
- vi. STBD – Blackout
- vii. PORT – Preferential Trip
- viii. STBD – Preferential Trip



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- ix. PORT – NBCD Mode
- x. STBD – NBCD Mode

20) Energy Distribution Centre

- a) EDC (76)
 - i. Breakers (16 nos.)

21) Diesel Alternator

- a) DA1 IPMS Control (8 DAs)
 - i. Control From DA SCC Panel
 - ii. Control from IPMS MFC
- b) DA1 APMS Control (8 DAs)

22) Gas Turbines

- a) IPMS Degraded HW Panel Commands
- b) SCC PORT HW Panel Commands
- c) SCC STBD HW Panel Commands
- d) FWD PORT HW Panel Commands
- e) FWD STBD HW Panel Commands
- f) AFT PORT HW Panel Commands
- g) AFT STBD HW Panel Commands
- h) GT1 HMI Commands
- i) GT2 HMI Commands
- j) GT3 HMI Commands
- k) GT4 HMI Commands

23) APMS Auxiliary

- a) Automatic Change Over/Remote Change Over Switches
 - i. RCOS BDCS - Fire Pump (20 nos.)
 - ii. RCOS BDCS - Salvage Pump (14 nos.)
 - iii. RCOS BDCS - Ballast Pump (6 nos.)
 - iv. RCOS BDCS - Fire Fighting System FER
 - v. RCOS BDCS - Fire Fighting System AER
 - vi. RCOS AFC - AVCAT Fuelling Pump (20 nos.)
 - vii. RCOS AFC - AVCAT Transfer Pump (7 nos.)

Contractor	Page 62 of 68	
		Issuing Officer



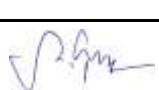
Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- viii. RCOS AFC - AVCAT Stripping Pump (2 nos.)
- ix. RCOS AFC - AVCAT FWD PLC Cabinet
- x. RCOS AFC - AVCAT AFT PLC Cabinet
- xi. RCOS AFC - Ammunition Lift Motor Controller (5 nos. of Lifts)
- xii. RCOS AFC - Main HPU Motor (2 nos. of Lifts)
- xiii. RCOS AFC - Back-up HPU Motor (2 nos. of Lifts)
- xiv. RCOS AFC - AVCAT FiFi AFT
- xv. RCOS AFC - AVCAT FiFi FWD
- xvi. RCOS AFC - Hangar Drive Assembly
- xvii. RCOS AFC - Power panel P.PP.3K1.01A [Fwd Hangar Door]
- xviii. RCOS AFC - Power panel P.PP.2U1.08A [Aft Hangar Door]
- xix. RCOS AFC - Power panel- P.PP.3K1.22A [Fwd Turn Table]
- xx. RCOS AFC - Power panel- P.PP.3S1.11A [Aft Turn Table]
- xxi. RCOS AUX - AC Plant RH (7 nos. of AC Plants)
- xxii. RCOS AUX - AC Plant LH (7 nos. of AC Plants)
- xxiii. RCOS AUX - Ref Plant (2 nos.)
- xxiv. RCOS AUX - IVTSS STP 7E1
- xxv. RCOS AUX - IVTSS STP 7E2
- xxvi. RCOS AUX - IVTSS STP 7J2
- xxvii. RCOS AUX - IVTSS STP 6P1
- xxviii. RCOS AUX - IVTSS STP 7V
- xxix. RCOS AUX - Bilge Pump (6 nos.)
- xxx. RCOS AUX - Fresh Water Pumps (8 nos.)
- xxxi. RCOS AUX - Chlorinator Pumps (8 nos.)
- xxxii. RCOS AUX - HP Air Compressor (3 nos.)
- xxxiii. RCOS AUX - LP Air Compressor (4 nos.)
- xxxiv. RCOS AUX - RO Plant (200 TPD) - (4 nos.)
- xxxv. RCOS AUX - RO Plant (5 TPD) - (2 nos.)
- xxxvi. RCOS AUX - SW Cooling Pump (6 nos.)
- xxxvii. RCOS AUX - FER Fuel Oil Main Transfer Pump (2 nos.)
- xxxviii. RCOS AUX - AER Fuel Oil Main Transfer Pump (2 nos.)
- xxxix. RCOS AUX - Fuel Oil Aux Transfer Pump (6 nos.)
- xl. RCOS AUX - FER FO Centrifuge (2 nos.)
- xli. RCOS AUX - AER FO Centrifuge (2 nos.)
- xlii. RCOS AUX - FER FO Centrifuge Heater
- xliii. RCOS AUX - AER FO Centrifuge Heater
- xliv. RCOS AUX - FDA LO Centrifuge (2 nos.)

Contractor

Page 63 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

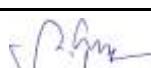
- xliv. RCOS AUX - ADA LO Centrifuge (2 nos.)
- xlvi. RCOS AUX - FDA LO Centrifuge Heater (2 nos.)
- xlvii. RCOS AUX - ADA LO Centrifuge Heater (2 nos.)
- xlviii. RCOS AUX - FDA LO Transfer Pump (2 nos.)
- xlxi. RCOS AUX - ADA LO Transfer Pump (2 nos.)
 - I. RCOS PROP - FER SW Cooling Pump (2 nos.)
 - II. RCOS PROP - AER SW Cooling Pump (2 nos.)
 - III. RCOS PROP - RG FER Lube Oil Centrifuge Heater (2 nos.)
 - IV. RCOS PROP - RG FER Lube Oil Centrifuge
 - V. RCOS PROP - RG AER Lube Oil Centrifuge
 - VI. RCOS PROP - RG FER Lube Oil Module
 - VII. RCOS PROP - RG AER Lube Oil Module
 - VIII. RCOS PROP - RG FER Lube Oil Transfer Pump
 - IX. RCOS PROP - RG AER Lube Oil Transfer Pump
 - X. RCOS PROP - GT1 Ventilation (4 nos.)
 - XI. RCOS PROP - GT HSS Module (4 nos.)
 - XII. RCOS PROP - 7M1-03A
 - XIII. RCOS PROP - 5M2-06A
 - XIV. RCOS PROP - 5Q1-05A
 - XV. RCOS PROP - 7Q2-01A :
 - XVI. RCOS PROP - GT Washing Module (2 nos.)
 - XVII. RCOS PROP - Port CPP Power Pack Starter (2 nos.)
 - XVIII. RCOS PROP - Stbd CPP Power Pack Starter (2 nos.)
 - XIX. RCOS PROP - 5R3-08A
 - XX. RCOS PROP - 5R4-08A
 - XI. RCOS EL. AUX - ROTARY CONVERTER1, 1PH, 25KVA AFT
 - XII. RCOS EL. AUX - ROTARY CONVERTER2, 1PH, 25KVA FWD
 - XIII. RCOS EL. AUX - ROTARY CONVERTER3, 3PH, 20KVA AFT
 - XIV. RCOS EL. AUX - ROTARY CONVERTER4, 3PH, 20KVA FWD
 - XV. RCOS EL. AUX - 4T CRANE
 - XVI. RCOS EL. AUX - 15T HYDR. CRANE (110kW)
 - XVII. RCOS EL. AUX - MF STAR RADAR

24) Fuel Oil Stripping System

- a) Centrifuge (2 nos.)

Contractor

Page 64 of 68


Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

25) Hatches and Doors

Since the Hatches & Doors parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

26) IVTS (Hull Auxiliaries)

Since the IVTS parameters are only monitored without any control from IPMS, the functionality checks are already covered under channel checks.

27) Propulsion Support System

- a) Propulsion Sea Water Cooling
- b) Propulsion Support – GT Fuel

28) Controllable Propeller Pitch

- a) IPMS Degraded HW Panel Commands
- b) SCC PORT HW Panel Commands
- c) SCC STBD HW Panel Commands
- d) FWD PORT HW Panel Commands
- e) FWD STBD HW Panel Commands
- f) AFT PORT HW Panel Commands
- g) AFT STBD HW Panel Commands
- h) HMI PORT Commands
- i) HMI STBD Commands

29) RGB System (Propulsion)

- a) IPMS Degraded HW Panel Commands
- b) SCC PORT HW Panel Commands
- c) SCC STBD HW Panel Commands
- d) FWD PORT HW Panel Commands
- e) FWD STBD HW Panel Commands
- f) AFT PORT HW Panel Commands
- g) AFT STBD HW Panel Commands
- h) HMI PORT Commands
- i) HMI STBD Commands

30) AC Plant & Ref Plant

- a) AC Plant LH (7 nos.)



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- b) AC Plant RH (7 nos.)

31) Salvage System

- a) Pumps (14 nos.)
- b) Valves (14 nos.)

32) Various Types Of Sensors

a) Level Transmitters/Draft Sensors

- For side mounted and top mounted Level Transmitters, a suitable arrangement shall be made and external pressure pump shall be used to the input pressure corresponding to the entire level range of the Transmitter
- With the pressure zero, the Transmitter output shall be 4 ± 0.5 mA, mid-range, the output is 12 ± 0.5 mA and for the maximum range, it shall be 20 ± 0.5 mA
- For Capacitive Level Transmitter, a small well arrangement is used
- Initially, zero value corresponds to 4 ± 0.5 mA and probe when fully immersed should indicate 20 ± 0.5 mA.

b) Level Switches/Flood Sensors (764 Flood Sensors)

- Put level sensor vertically/horizontally as per the sensor type and verify that the contact "NC" is closed
- If the testing provision is available in the switch, the same shall be simulated to verify the contact "NC" is opened
- For Flood Sensor, initially verify the contact "NC" is closed
- The float shall be simulated to verify the contact "NC" is opened

c) Pressure Switches

- Connect the Manual Pressure pump to the Pressure Switch using the suitable mechanical adapter
- Verify with that the contact "NC" is closed
- Gradually increase the pressure of the Manual Pressure Generator till the contacts of the Pressure Switch closes (usually closes with a clicking sound)
- Verify that "NC" is opened



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

d) Pressure Transmitters

- Mount the Pressure Transmitter on the Manual Pressure Generator with suitable adapters
- Adjust the pressure input of the Manual Pressure Generator near minimum scale (0 bar) of the Transmitter and verify that the output is 4 ± 0.5 mA
- Gradually adjust the pressure of the Manual Pressure Generator near mid-scale of the Transmitter, and verify that the output is 12 ± 0.5 mA
- Adjust the pressure input of the Manual Pressure Generator near full scale of the Transmitter, and verify the output is 20 ± 0.5 mA

e) Temperature Transmitters

- The probe to be tested is immersed in an Electronic Bath
- Bath is set to 100 degree centigrade; the reading shall be 100 ± 3 deg. centigrade

f) Proximity Sensors – Doors & Hatches (482 nos.)

- An iron plate is initially maintained at 5mm distance from the sensor using 5mm spacer
- Verify that the LED is “ON “on the Sensor
- Add 8mm spacer to obtain total of 13mm space between iron plate and sensor
- At this 13mm distance, verify that the LED on the Sensor is “OFF”

g) Flow Switches

- Insert the Flow Switch in the process pipe and check that the display comes ON and the LED blinks RED
- Allow the process fluid to flow through the pipe the Flow Meter is fitted and slowly increase the flow as applicable
- Allow the Sensor to stabilize and check that the LED will stop blinking and LED will glow “GREEN” indicating the flow
- The process flow to be stopped and allow the sensor to stabilize
- Check that the LED will blink RED

h) Flow Transmitters

Contractor	Page 67 of 68	
		Issuing Officer



Commissioning (STW, HAT & SAT) Of IPMS For P71(IAC)

Tender Reference:
DE/P71(IAC)/IPMS/
COMM/2019/02

- Insert the Flow Transmitter in the process pipe and check that the display comes ON indicating zero flow
- Allow the process fluid to flow through the pipe the Flow Transmitter is fitted and slowly increase the flow as applicable
- Allow the sensor to stabilize and the flow readings
- The process flow to be stopped and allow the sensor to stabilize. Check the display comes on indicating zero flow.

i) Electrical Inclinometer

- Slowly tilt the Inclinometer in any of the axis (X or Y) to see that mA output increases towards 20 mA in either direction (the mA output may exceed 20mA if tilted more than the scale of inclinometer)



**PRE-QUALIFICATION CRITERIA
DEFENCE ENGINEERING**

PQ-460-020

Rev 00

Page 1 of 3

COPYRIGHT AND CONFIDENTIAL
THIS INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST
BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETERIMENTAL TO THE INTEREST OF THE COMPANY

**PQC For
Commissioning (STW, HAT & SAT)
Of IPMS For P71(IAC)**

COPYRIGHT AND CONFIDENTIAL
THIS INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST
BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETERIMENTAL TO THE INTEREST OF THE COMPANY

REVISION 00

APPROVED

Banadev

PREPARED

ISSUED

V. P. Singh

DATE

18-11-2019



**PRE-QUALIFICATION CRITERIA
DEFENCE ENGINEERING**

PS-460-020

Rev 00

Page 2 of 3

**PQC For Commissioning (STW, HAT & SAT) Of
IPMS For P71(IAC)**

1) Pre-Qualification Criteria (PQC):

Sl. No.	Particulars	To Be Filled By Bidder
1.0	<p>Experience Certificate for having successfully completed similar works during immediate last 7 years as mentioned below: (<i>Similar work means working with Naval Systems</i>)</p> <p>One work not less than Rs. 40.00 Lakhs OR</p> <p>Two works of not less than Rs. 25.00 Lakhs each OR</p> <p>Three works of not less than Rs. 20.00 Lakhs each</p> <p>(Copy of report from the organization where the work is executed is to be enclosed. Submission of Work Order copy is not adequate)</p>	
2.0	Average Turn Over of the last three years (not less than Rs 50 lakhs/year)	Rs.
2.1	Turnover - Previous financial year (2018-19)	Rs.
2.2	Turnover - 1 year before previous financial year (2017-18)	Rs.
2.3	Turnover – 2 years before previous financial year (2016-17)	Rs.

COPYRIGHT AND CONFIDENTIAL

THIS INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETERIMENTAL TO THE INTEREST OF THE COMPANY



PRE-QUALIFICATION CRITERIA DEFENCE ENGINEERING

PS-460-020

Rev 00

Page 3 of 3

2) Document Submission:

2.1) Tender should be accompanied by a list of contracts already held by the Contractor at the time of submitting the tender and giving the following particulars:

- Name of work, value and address.
- The balance work remaining to be done on the same.

COPYRIGHT AND CONFIDENTIAL
THIS INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST
BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETERIMENTAL TO THE INTEREST OF THE COMPANY



GENERAL CONDITIONS OF CONTRACT

2019

ಭಾರತ್ ಹೆಚ್‌ಎಲ್ ಎಲೆಕ್ಟ್ರಿಕ್ಸ್ ಲಿಮಿಟೆಡ್, ವಿದ್ಯುನ್‌ಾಣ ವಿಭಾಗ, ಬೆಂಗಳೂರು

ಭಾರತ ಹೆಚ್ ಇಲೆಕ್ಟ್ರಿಕ್ಸ್ ಲಿಮಿಟೆಡ್, ಇಲೆಕ್ಟ್ರಾನಿಕ್ಸ್ ಡಿವಿಜನ್, ಬೆಂಗಳೂರು

Bharat Heavy Electricals Limited, Electronics Division, Bengaluru

CONTENTS

Chapter-1

- 1. General Instructions to Tenderers*
 - 1.1. Dispatch Instructions*
 - 1.2. Submission of Tenders*
 - 1.3. Language*
 - 1.4. Price Discrepancy*
 - 1.5. Evaluation of Bids*
 - 1.6. Data to be enclosed*
 - 1.7. Authorisation and Attestation*
 - 1.8. Earnest Money Deposit*
 - 1.9. Security Deposit*
 - 1.10. Return of Security Deposit*
 - 1.11. Bank Guarantee*
 - 1.12. Validity of offer*
 - 1.13. Execution of Contract Agreement*
 - 1.14. Rejection of Tender and other Conditions*
 - 1.15 BHEL Fraud Prevention Policy*

2. Chapter-2

2.1. Definitions

2.2. Law Governing Contract and Court Jurisdiction

2.3. Issue of Notice

2.4. Use of land

2.5. Commencement of Work

2.6. Measurement of Work and Mode of Payment

2.7. Rights of BHEL

2.8. Responsibilities of Contractor in respect of Local Laws, Employment of Workers etc

2.9. Progress Monitoring, Monthly Review and Performance Evaluation

2.10. Time of Completion

2.11. Extension of Time for Completion

2.12. Over Run Compensation

2.13. Quantity Variation

2.14. Extra Works

2.15. Supplementary Items

2.16. Strikes & Lockout

2.17. Force Majeure

2.18. Arbitration and Reconciliation

2.19. Payments

2.20. Performance Guarantee for Workmanship

2.21. Closing of Contracts

2.22. Reverse Auction

2.23. Suspension of Business Dealings

2.24. Other Issues

CHAPTER -1

1. GENERAL INSTRUCTION TO TENDERERS

1.1. DESPATCH INSTRUCTION

i) The General Conditions of Contract form part of the Tender specifications. All pages of the tender documents shall be duly signed, stamped and submitted along with the offer in token of complete acceptance thereof. The information furnished shall be complete by itself. The tenderer is required to furnish all the details and other documents as required in the following pages

ii) Tenderers are advised to study all the tender documents carefully. Any submission of tender by the tenderer shall be deemed to have been done after careful study and examination of the tender documents and with the full understanding of the implications thereof. Should the tenderers have any doubt about the meaning of any portion of the Tender Specification or find discrepancies or omissions in the drawings or the tender documents issued are incomplete or shall require clarification on any aspects, the scope of work etc., he shall contact the authority inviting the tender well in time (so as not to affect last date of submission) for clarification before the submission of the tender. Tenderer's request for clarifications shall be with reference to Sections and Clause numbers given in the tender documents. The tender specifications and terms and conditions shall be deemed to have been accepted by the tenderer in the offer. Pre requirements and conditions shall be liable for rejection.

iii) Integrity pact (IP): If NIT calls for Integrity Pact, the same shall be duly signed & stamped by the authorised signatory & submitted along with tender document.

1.2. SUBMISSION OF TENDERS

1.2.1 *The tenderers must submit their tenders as per instructions in the NIT*

1.2.2 *BHEL takes no responsibility for delay, loss or non-receipt of tenders sent by post/courier. The tenders received after the specified time of their submission are treated as 'Late Tenders' and shall not be considered under any circumstances. Offers received by Fax/Email/Internet shall be considered as per terms of NIT.*

1.2.3 *Tenders shall be opened by authorised Officer of BHEL at his office at the time and date as specified in the NIT, in the presence of such of those tenderers or their authorised representatives who may be present*

1.2.4 Tenderers whose bids are found techno commercially qualified shall be informed the date and time of opening of the Price Bids and such Tenderers may depute their representatives to witness the opening of the price bids. BHEL's decision in this regard shall be final and binding.

1.2.5 Before submission of Offer, the tenderers are advised to inspect the site of work and the environments and be well acquainted with the actual working and other prevalent conditions, facilities available, position of material and labour, means of transport and access to Site, accommodation, etc. No claim will be entertained later on the grounds of lack of knowledge of any of these conditions.

1.3. LANGUAGE

1.3.1 The tenderer shall quote the rates in English language and international numerals. These rates shall be entered in figures as well as in words. For the purpose of the tenders, the metric system of units shall be used.

1.3.2 All entries in the tender shall either be typed or written legibly in ink. Erasing and over-writing is not permitted and may render such tenders liable for rejection. All cancellations and insertions shall be duly attested by the tenderer.

1.4 PRICE DISCREPANCY:

1.4.1 Conventional (Manual) Price Bid opening:

i) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of BHEL there is obvious misplacement of decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly

ii) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected;

iii) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (i) and (ii) above.

iv) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date up to which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of BHEL, the bid is liable to be ignored.

v) In case of lump sum price, if there is any difference between the amount in figures and in words, the amount quoted by the bidder in words shall be taken as correct.

vi) In case of omission in quoting any rate for one or more items, the evaluation shall be done considering the highest quoted rate obtained against the respective items by other tenderers for the subject tender. If the tenderer becomes L-1, the notional rates for the omission items shall be the lowest rates quoted for the respective items by the other tenderers against the respective omission items for the subject job and the 'Total quoted price (loaded for omissions)' shall be arrived at. However the overall price remaining the same as quoted originally, the rates for all the items in the 'Total quoted price (loaded for omissions)' shall be reduced item wise in proportion to the ratio of 'Original' total price and the 'Total quoted price (loaded for omissions)'.

1.4.2 Reverse Auction: In case of Reverse Auction, the successful bidder shall undertake to execute the work as per overall price offered by him during the Reverse Auction process. In case of omission of rates, the procedure shall be as per 'Guidelines for Reverse Auction' enclosed.

i) Offers from tenderers who are under suspension (banned) by any Unit/Region/Division of BHEL shall not be considered.

ii) Offers from tenderers who do not comply with the latest guidelines of Ministry/Commissions of Govt of India shall not be considered.

1.5. EVALUATION OF BIDS

i) Technical Bids submitted by the tenderer will be opened first and evaluated for fulfilling the Pre-Qualification criteria and other conditions in NIT/Tender documents, based on documentary evidences submitted along with the offer, BHEL reserves the right to ask for proofs/documents, clarification in relation to Technical/commercial data during tender evaluation

ii) Price Bids of shortlisted bidders shall only be opened either through the conventional price bid opening or through electronic Reverse Auction, at the discretion of BHEL

iii) Price Bids of unqualified bidders shall not be opened. Reasons for rejection shall be intimated to the vendor before the opening of Price bid.

1.6. DATA TO BE ENCLOSED

The following information in full shall be furnished by the tenderer. Non-submission of this information may lead to rejection of the offer.

i) INCOME TAX PERMANENT ACCOUNT NUMBER, GSTIN, SAC, HSN Certified copies of PAN, GSTIN shall be furnished along with tender. The names, addresses and contact information of the Directors/Partners shall be furnished along with the offer.

ii) An attested copy of the Power of Attorney, in case the tender is signed by an individual other than the sole proprietor.

iii) IN CASE OF INDIVIDUAL TENDERER:

His / her full name, address, PAN, GSTIN and place & nature of business to be furnished.

iv) IN CASE OF PARTNERSHIP FIRM

The names of all the partners and their addresses, a copy of the partnership deed/instrument of partnership shall be enclosed.

v) IN CASE OF COMPANIES:

Date and place of registration including date of commencement certificate in case of Public Companies (certified copies of Memorandum and articles of Association are also to be furnished). Nature of business carried on by the Company and the provisions of the Memorandum relating thereof.

1.7. AUTHORISATION AND ATTESTATION

Tenders shall be signed by a person duly authorised/empowered to do so. An attested copy of the Power of Attorney, in case the tender is signed by an individual other than the sole proprietor shall be submitted along with the tenders

1.8. EARNEST MONEY DEPOSIT

1.8.1 Every tender must be accompanied by the prescribed amount of Earnest Money Deposit (EMD) in the manner described herein.

The EMD may be accepted only in the following forms:

- (i) Electronic Fund Transfer credited in BHEL account (before tender opening)*
- (ii) Banker's cheque/ Pay order/ Demand draft, in favor of BHEL (along with offer) In case total EMD amount is more than Rs 20 Lakh, the amount in excess of Rs 20 lakh maybe accepted in the form of Bank Guarantee from scheduled bank. The Bank Guarantee in such cases shall be valid for at-least six months.*
- (iii) Through SBI collect (before tender opening)*
- (iv) No other form of EMD remittance shall be acceptable to BHEL*

1.8.2 EMD by the bidder will be forfeited as per Tender Documents if

- i) After opening the tender and within the offer validity period, the tenderer revokes his/her tender or makes any modification in his tender which is not acceptable to BHEL.*
- ii) The Contractor fails to deposit the required Security deposit or commence the work within the period as per LOI/ Contract.*
- iii) EMD by the tenderer shall be withheld in case any action on the tenderer is envisaged in derailing the tender process by unlawful means*

1.8.3 EMD shall not carry any interest.

1.8.4 *In the case of unsuccessful bidders, the Earnest Money will be refunded to them within a reasonable time after acceptance of award by successful tenderer.*

1.8.5 *EMD of successful tenderer will be converted as part of Security Deposit*

1.9. SECURITY DEPOSIT

The total amount of Security Deposit will be 5% of the contract value (including all applicable taxes) EMD of the successful tenderer shall be converted and adjusted towards the required amount of Security Deposit.

1.9.1 Modes of Security deposit:

The balance amount to make up the required Security Deposit of 5% of the contract value may be accepted in the following forms:

- i) Cash (as permissible under the extant Income Tax Act)*
- ii) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL*
- iii) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL*
- iv) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL)*
- v) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL) (Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)*
- vi) 50% of the required Security Deposit, including the EMD, should be paid before start of the work. Balance of the Security Deposit can be collected by deducting 10% of the gross amount progressively from each of the running bills of the Contractor till the total amount of the required Security Deposit is collected. If the value of work done at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the Contractor or recovered from payment/s due to the Contractor. Security Deposit shall be released to the Contractor upon fulfilment of contractual obligations as per terms of the contract.*

1.9.2 The Security Deposit shall not carry any interest.

1.9.3 The validity of Bank Guarantees towards Security Deposit shall be initially up to the completion period as stipulated in the Letter of Intent/Award (plus maintenance period if applicable), and 03 months claim period. The same shall be kept valid by proper renewal till the acceptance of Final Bills of the Contractor, by BHEL

1.9.4 BHEL reserves the right of forfeiture of Security Deposit in addition to other claims and penalties in the event of the Contractor's failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract. BHEL reserves the right to set off the Security Deposit against any claims of other contracts with BHEL.

1.10. REFUND OF SECURITY DEPOSIT

50% of the security deposit may be refunded on completion of the work after payment of the final bill and the balance 50% of the security deposit is refunded only after the expiry of the maintenance period from date of completion of work as stipulated in the contract concerned.

1.10.1 DEFECTS LIABILITY PERIOD:

The contractor shall be responsible to make good and remedy at his own expenses within such period as may be stipulated by the Engineer-in-charge, any defect which may develop or may be noticed before the expiry of the maintenance period of six months or as stipulated in NIT hereto from the certified date of completion and intimation of which has been sent to the contractor within seven days of the expiry of the said period by a letter sent by hand delivery or by registered post or Email. If contractor fails to attend to the above, defect will be rectified at contractor's risk & cost and same will be deducted from the security deposit/payable amounts available with BHEL.

1.11. BANK GUARANTEES

Where ever Bank Guarantees are to be furnished/submitted by the contractor, the following shall be complied with

- i) Bank Guarantees shall be from Scheduled Banks / Public Financial Institutions as defined in the Companies Act.*
- ii) The Bank Guarantees shall be as per prescribed BHEL formats.*
- iii) It is the responsibility of the bidder to get the Bank Guarantees revalidated/extended for the required period (subject to a minimum period of six months), as per the advice of BHEL. BHEL shall not be liable for issue of any reminders regarding expiry of the Bank Guarantees.*
- iv) In case extension/further extensions of any Bank Guarantees are not required, the bidders shall ensure that the same is explicitly endorsed by BHEL*
- v) In case the Bank Guarantees are not extended before the expiry date, BHEL reserves the right to invoke the same by informing the concerned Bank in writing, without any advance notice/communication to the concerned bidder.*
- vi) Bidders to note that any corrections to Bank Guarantees shall be done by the issuing Bank, only through an amendment in an appropriate non judicial stamp paper.*
- vii) The Original Bank Guarantee shall be sent directly by the Bank to BHEL under Registered Post (Acknowledgement Due).*

1.12. VALIDITY OF OFFER

The rates in the Tender shall be kept open for acceptance for a minimum period of Ninety (90) DAYS from latest due date of offer submission (including extension, if any). In case BHEL calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderers.

1.13 EXECUTION OF CONTRACT AGREEMENT

The successful tenderer's responsibility under this contract commences from the date of issue of the Letter of Intent by BHEL. The Tenderer shall submit an unqualified acceptance to the Letter of Intent/Award within the period stipulated therein.

The successful tenderer shall be required to execute an agreement in the prescribed form, with BHEL, within fifteen days (15 days) after the acceptance of the Letter of Intent/Award, and in any case before releasing the first running bill. The contract agreement shall be signed by a person duly authorized/empowered by the tenderer. The expenses for preparation of agreement document shall be borne by Tenderer.

1.14. REJECTION OF TENDER AND OTHER CONDITIONS

1.14.1 The acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever:-

- a. To reject any or all of the tenders.*
- b. To split up the work amongst two or more tenderers as per NIT*
- c. To award the work in part if specified in NIT*
- d. In case of either of the contingencies stated in (b) and (c) above, the time for completion as stipulated in the tender shall be applicable.*

1.14.2 Conditional tenders, unsolicited tenders, tenders which are incomplete or not in the form specified or defective or have been materially altered or not in accordance with the tender conditions, specifications etc., are liable to be rejected.

1.14.3 Tenders are liable to be rejected in case of unsatisfactory performance of the tenderer with BHEL, or tenderer under suspension (hold/banning /delisted) by any unit / region / division of BHEL or tenderers who do not comply with the latest guidelines of Ministry/Commissions of Govt of India. BHEL reserves the right to reject a bidder in case it is observed that they are overloaded and may not be in a position to execute this job. The decision of BHEL will be final in this regard.

1.14.4 If a tenderer who is a proprietor expires after the submission of his tender or after the acceptance of his tender, BHEL may at their discretion, cancel such tender. If a partner of a firm expires after the submission of tender or after the acceptance of the tender, BHEL may then cancel such tender at their discretion, unless the firm retains its character.

1.14.5 BHEL will not be bound by any Power of Attorney granted by changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.

1.14.6 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money/Security Deposit/any other money due.

1.14.7 Canvassing in any form in connection with the tenders submitted by the Tenderer shall make his offer liable to rejection.

1.14.8 In case the Proprietor, Partner or Director of the Company/Firm submitting the Tender, has any relative or relation employed in BHEL, the authority inviting the Tender shall be informed, along with the Offer. Failing to do so, BHEL may, at its sole discretion, reject the tender or cancel the contract and forfeit the Earnest Money/Security Deposit.

1.14.9 The successful tenderer should not sub-contract part or complete work detailed in the tender specification undertaken by him without written permission of BHEL's Construction Manager/Site Incharge. The tenderer is solely responsible to BHEL for the work awarded to him.

1.14.10 The Tender submitted by a techno commercially qualified tenderer shall become the property of BHEL who shall be under no obligation to return the same to the bidder. However unopened price bids and late tenders shall be returned to the bidders after finalization of contract.

1.14.11 Unsolicited discount received after the due date and time of Bid Submission shall not be considered for evaluation. However, if the party who has submitted the unsolicited discount/rebate becomes the L-I party, then the awarded price i.e contract value shall be worked out after considering the discount so offered.

1.14.12 BHEL shall not be liable for any expenses incurred by the bidder in the preparation of the tender irrespective of whether the tender is accepted or not.

1.15 BHEL Fraud Prevention Policy :

The bidder along with its associate/ collaborators/sub-contractors/ Sub-Vendors/ Consultants/service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice. Fraud prevention policy and list of Nodal officers shall be hosted on BHEL website, vendor portals of Units/Regions Internet.

CHAPTER-2

2.1 DEFINITION: The following terms shall have the meaning hereby assigned to them except where the context otherwise requires

- i) *BHEL shall mean Bharat Heavy Electricals Limited, a company registered under Companies Act 1956, with its Registered Office at BHEL HOUSE, SIRI FORT, NEW DELHI – 110 049, or its Authorised Officers or its Site Engineers or other employees authorised to deal with any matters with which these persons are concerned on its behalf.*
- ii) *“EXECUTIVE DIRECTOR” or ‘GROUP GENERAL MANAGER’ or “GENERAL MANAGER (Incharge)” or “GENERAL MANAGER” shall mean the Officer in Electronics Division, Mysore road, Bengaluru-560026*
- iii) *“COMPETENT AUTHORITY” shall mean Executive Director or Group General Manager or General Manager (In-charge) or General Manager or BHEL Officers who are empowered to act on behalf of the Executive Director or General Manager (In-charge) or General Manager of BHEL.*
- iv) *“ENGINEER” or “ENGINEER IN CHARGE” shall mean an Officer of BHEL as may be duly appointed and authorized by BHEL to act as “Engineer” on his behalf for the purpose of the Contract, to perform the duty set forth in this General Conditions of Contract and other Contract documents. The term also includes ‘CONSTRUCTION MANAGER’ or ‘SITE INCHARGE’ as well as Officers*
- v) *“SITE” shall mean the places or place at which the plants/equipment are to be erected and services are to be performed as per the specification of this Tender.*
- vi) *“CLIENT OF BHEL” or “CUSTOMER” shall mean the project authorities with whom BHEL has entered into a contract for supply of equipment or provision of services.*
- vii) *“CONTRACTOR” shall mean the successful Bidder/Tenderer who is awarded the Contract and shall include the Contractor’s successors, heirs, executors, administrators and permitted assigns.*

viii) "CONTRACT" or "CONTRACT DOCUMENT" shall mean and include the Work Order, Contract Agreement, the accepted appendices of Rates, Schedules, Quantities if any, General Conditions of Contract, Special Conditions of Contract, Instructions to the Tenderers, Drawings, Technical Specifications, the Special Specifications if any, the Tender documents, subsequent amendments mutually agreed upon and the Letter of Intent/Acceptance issued by BHEL. Any conditions or terms stipulated by the contractor in the tender documents or subsequent letters shall not form part of the contract unless, specifically accepted in writing by BHEL in the Letter of Intent/Award and incorporated in the agreement.

ix) "GENERAL CONDITIONS OF CONTRACT" shall mean the 'Instructions to Tenderers' and 'General Conditions of Contract' pertaining to the work for which above tenders have been called for.

x) "TENDER SPECIFICATION" or "TENDER" or "TENDER DOCUMENTS" shall mean General Conditions, Common Conditions, Special Conditions, Price Bid, Rate Schedule, Technical Specifications, Appendices, Annexures, Corrigendum's, Amendments, Forms, procedures, Site information, etc and drawings/documents pertaining to the work for which the tenderers are required to submit their offers. Individual specification number will be assigned to each Tender Specification.

xi) "LETTER OF INTENT" shall mean the intimation by a Post/Fax/email to the tenderer that the tender has been accepted in accordance with provisions contained in the letter. The responsibility of the contractor commences from the date of issue of this letter and all terms and conditions of the contract are applicable from this date.

xii) "COMPLETION TIME" shall mean the period by 'date/month' specified in the 'Letter of Intent/Award' or date mutually agreed upon for handing over of the intended scope of work, the erected equipment/plant which are found acceptable by the Engineer, being of required standard and conforming to the specifications of the Contract.

xiii) "PLANT" shall mean and connote the entire assembly of the plant and equipment's covered by the contract.

xiv) "EQUIPMENT" shall mean equipment, machineries, materials, structural, electrical and other components of the plant covered by the contract.

xv) "TESTS" shall mean and include such test or tests to be carried out on the part of the contractor as are prescribed in the contract or considered necessary by BHEL, in order to ascertain the quality, workmanship, performance and efficiency of the contractor or part thereof.

xvi) "APPROVED", "DIRECTED" or "INSTRUCTED" shall mean approved, directed or instructed by BHEL.

xvii) "WORK or CONTRACT WORK" shall mean and include supply of all categories of labour, specified consumables, tools and tackles and Plants required for complete and satisfactory site transportation, handling, stacking, storing, erecting, testing and commissioning of the equipment's to the entire satisfaction of BHEL.

xviii) "SINGULAR AND PLURALS ETC" words carrying singular number shall also include plural and vice versa, where the context so requires. Words imparting the masculine Gender shall be taken to include the feminine Gender and words imparting persons shall include any Company or Associations or Body of Individuals, whether incorporated or not.

xix) "HEADING" – The heading in these General Conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken as instructions thereof or of the contract.

xx) "MONTH" shall mean calendar month unless otherwise specified in the Tender.

xxi) Day' or 'Days' unless herein otherwise expressly defined shall mean calendar day or days of twenty four (24) hours each. A week shall mean continuous period of seven (7) days.

xxii) "COMMISSIONING" shall mean the synchronization testing and achieving functional operation of the Equipment with associated system after all initial adjustments, trials, cleaning, re-assembly required at site if any, have been completed and Equipment with associated system is ready for taking into service.

xxiii) "WRITING" shall include any manuscript type written or hand written or printed statement or electronically transmitted messages, under the signature or seal or transmittal of BHEL.

xxiv) "TEMPORARY WORK" shall mean all temporary works for every kind required in or for the execution, completion, maintenance of the work.

xxv) 'CONTRACT PRICE' or 'CONTRACT VALUE' shall mean the sum including applicable taxes mentioned in the LOI/LOA/Contract Agreement subject to such additions thereto or deductions there from as may be made under provisions hereinafter contained

xxvi) "COMMENCEMENT DATE" or "START DATE" shall mean the commencement/start of work at Site as per terms defined in the Tender

xxvii) "SHORT CLOSING" or "FORE CLOSING" of Contract shall mean the premature closing of Contract, for reasons not attributable to the contractor and mutually agreed between BHEL and the contractor

xxviii) "TERMINATION" of Contract shall mean the pre mature closing of contract due to reasons as mentioned in the contract

2.2 LAW GOVERNING THE CONTRACT AND COURT JURISDICTION

The contract shall be governed by the Law for the time being in force in the Republic of India. The Civil Court having original Civil Jurisdiction at Bengaluru, shall alone have exclusive jurisdiction in regard to all claims in respect of the Contract. No other Civil Court shall have jurisdiction in case of any dispute, under this contract

2.3 ISSUE OF NOTICE

2.3.1 Service of notice on contractor: Any notice to be given to the Contractor under the terms of the contract shall be served by sending the same by Registered Post / Speed Post / FAX / Email to or leaving the same at the Contractor's last known address of the principal place of business (or in the event of the contractor being a company, to or at its Registered Office). In case of change of address, the notice shall be served at changed address as notified in writing by the Contractor to BHEL. Such posting or leaving of the notice shall be deemed to be good service of such notice and the time mentioned to the condition for doing any act after notice shall be reckoned from the date so mentioned in such notice.

2.3.2 Service of notice on BHEL Any notice to be given to BHEL in-charge under the terms of the Contract shall be served by sending the same by post or Email or leaving the same at BHEL address or changed address as notified in writing by BHEL to the Contractor.

2.4 USE OF LAND

No land belonging to BHEL or their Customer under temporary possession of BHEL shall be occupied by the contractor without written permission of BHEL.

2.4.1 STORES AND MATERIALS:

The contractor shall, at his own expense, supply all stores and materials required for the contract, other than those which may be provided by BHEL at the rates detailed therein subject to their availability at the place of issue indicated therein. All stores and materials to be supplied by the Contractor shall be of the best kind as described in the Specifications and the Contractor shall, if required by the Engineer -in- charge furnish him with proof to his satisfaction that the store and materials so comply with the specifications.

The contractor shall, at his own expense and without delay, supply samples of stores and materials proposed to be used in the execution of the work for the approval of the Engineer-in-charge, who may reject all stores and materials not corresponding either in quality or character to the approved samples.

In the case of stores provided by BHEL, the Contractor shall bear the cost of loading, transporting to site, unloading, storing under cover as required, assembling & jointing the several parts together as necessary and incorporating & fixing these stores & materials in the work, including all preparatory work of whatever description that may be required, and closing, preparing, loading and returning empty cases or containers to the place of issue without any extra charges.

Contractor is responsible for safe & secure storage of above material.

2.4.2 PATENT RIGHTS:

The contractor shall fully indemnify BHEL, or the agent, servant, or employee of BHEL, against any action, claim or proceeding relating to infringement or the use of any patent or design or any alleged patent or design rights, and shall pay any royalties which may be payable in respect of any article/ or part thereof included in the contract.

In the event of any claims being made or action brought against BHEL, or any agent, or servant or employee of BHEL., in respect of any of the matters aforesaid, the contractor shall not apply when such increment has taken place in complying with the specific directions issued by the BHEL but the contractor shall pay any royalties payable in respect of any such use.

2.4.3 WATER :

The contractor shall allow in his tender and provide at his cost all water required for the work or his employees on the work, together with all pipes and fittings or other means that may be necessary or required to ensure a proper and ample supply of water for all purpose connected with the work.

In the event of a provision existing in the Tender documents for supply of water on payment by BHEL, water will be supplied from the BHEL supply System, or other sources at any points fixed by the Site Engineer/ Engineer-in-charge on the site of work. The contractor shall make necessary arrangement for lifting, pumping, carrying or conveying the water as required at his own cost. The levy of water charges to be borne by the Contractor in such case shall be specifically mentioned in the Tender documents.

2.4.4 TEMPORARY WORKSHOPS, STORES ETC :

The Contractor shall, during the progress of the work provide, erect and maintain at his own expense all necessary temporary workshops, store, offices, toilets etc., required for the proper and efficient execution of the work. The planning, siting and erection of these building shall have the approval of the Engineer-in-charge and the Contractor shall at all times keep them in a clean and sanitized condition to the entire satisfaction of the Engineer-in-charge.

On completion of the work all such temporary buildings shall be cleared and the site restored to its original state in a clean and tidy condition to the entire satisfaction of the Engineer-in-charge.

2.5 COMMENCEMENT OF WORK

2.5.1 Time is essence of contract and is specified in the tender document or in each individual work order.

2.5.2 The contractor shall commence the work within seven(07) days from LOI/work order or as intimated by BHEL and shall proceed with the same with due expedition without delay.

2.5.3 If the contractor fails to start the work within stipulated time as per LOI or as intimated by BHEL, then BHEL at its sole discretion will have the right to cancel the contract. The Earnest Money and/or Security Deposit with BHEL will stand forfeited without any further reference to him without prejudice to any and all of BHEL's other rights and remedies in this regard.

2.5.4 All the work shall be carried out under the direction and to the satisfaction of BHEL.

2.6 MEASUREMENT OF WORK AND MODE OF PAYMENT:

2.6.1 All payments due to the contractors shall be made by electronic mode only, unless otherwise found operationally difficult.

2.6.2 For progress running bill payments: - The Contractor shall present detailed measurement sheets in triplicate, duly indicating all relevant details based on technical documents and connected drawings for work done during the month/period under various categories in line with terms of payment as per contract. The basis of arriving at the quantities, weights shall be relevant documents and drawings released by BHEL. These measurement sheets shall be prepared jointly with BHEL Engineers and signed by both the parties.

2.6.3 These measurement sheets will be checked by BHEL Engineer and quantities and percentage eligible for payment under various groups shall be decided by BHEL Engineer. The abstract of quantities and percentage so arrived at based on the terms of payment shall be entered in Measurement Book and signed by both the parties.

2.6.4 Based on the above quantities, contractor shall prepare the bills in prescribed format and work out the financial value. These will be entered in Measurement Book and signed by both the parties. Payment shall be made by BHEL after effecting the recoveries due from the contractor.

2.6.5 All recoveries due from the contractor for the month/period shall be effected in full from the corresponding running bills unless specific approval from the competent authorities is obtained to the contrary.

2.6.6 Measurement shall be restricted to that portion of work for which it is required to ascertain the financial liability of BHEL under this contract.

2.6.7 The measurement shall be taken jointly by persons duly authorized on the part of BHEL and by the Contractor.

2.6.8 The Contractor shall bear the expenditure involved if any, in making the measurements and testing of materials to be used/used in the work. The contractor shall, without extra charges, provide all the assistance with appliances and other things necessary for measurement.

2.6.9 If at any time due to any reason whatsoever, it becomes necessary to re-measure the work done in full or in part, the expenses towards such re measurements shall be borne by the contractor unless such re measurements are warranted solely for reasons not attributable to contractor.

2.6.10 Passing of bills covered by such measurements does not amount to acceptance of the completion of the work measured. Any left out work has to be completed, if pointed out at a later date by BHEL.

2.6.11 Final measurement bill shall be prepared in the final bill format prescribed for the purpose based on the certificate issued by BHEL Engineer that entire works as stipulated in tender specification has been completed in all respects to the entire satisfaction of BHEL. Contractor shall give unqualified "No Claim" Certificate. All the tools and tackles loaned to him should be returned in satisfactory condition to BHEL. The abstract of final quantities and financial values shall also be entered in the Measurement Books and signed by both parties to the contract. The Final Bill shall be prepared and paid within a reasonable time after completion of work.

2.7 RIGHTS OF BHEL

BHEL reserves the following rights in respect of this contract during the original contract period or its extensions if any, as per the provisions of the contract, without entitling the contractor for any compensation.

2.7.1 To withdraw any portion of work and/or to restrict/alter quantum of work as indicated in the contract during the progress of work and get it done through other agencies to suit BHEL's commitment to its customer or in case BHEL decides to advance the date of completion due to other emergent reasons/ BHEL's obligation to its customer.

2.7.2 To terminate the contract or get any part of the work done through other agency or deploy BHEL's own/hired/otherwise arranged resources , at the risk and cost of the contractor after due notice of a period of two weeks by BHEL, in the event of:-

- i) Contractor's continued poor progress
- ii) Withdrawal from or abandonment of the work before completion of the work
- iii) Contractor's inability to progress the work for completion as stipulated in the contract
- iv) Poor quality of work
- v) Corrupt act of Contractor
- vi) Insolvency of the Contractor

vii) Persistent disregard to the instructions of BHEL

viii) Assignment, transfer, sub-letting of contract without BHEL's written permission

ix) Non fulfillment of any contractual obligations / non-compliance of statutory requirements

x) In the opinion of BHEL, the contractor is overloaded and is not in a position to execute the job as per required schedule

2.7.3 To meet the expenses including BHEL overheads of 35% & Liquidated damage/penalties arising out of "Risk & Cost" as explained above under Sl.No. 2.7.2. BHEL shall recover the amount from any money due from Contractor, from any money due to the Contractor including Security Deposit or by forfeiting any T&P or material of the contractor under this contract or any other contract of BHEL or by any other means or any combination thereof

2.7.4 To terminate the contract or to restrict the quantum of work and pay for the portion of work executed in case BHEL's contract with their customer are terminated for any reason, as per mutual agreement.

2.7.5 To effect recovery from any amounts due to the contractor under this or any other contract or in any other form, the moneys BHEL is statutorily forced to pay to anybody, due to contractor's failure to fulfill any of his obligations. BHEL shall levy overheads of 35% on all such payments.

2.7.6 While every endeavor will be made by BHEL to this end, they cannot guarantee uninterrupted work due to conditions beyond their control. The Contractor will not be normally entitled for any compensation/extra payment on this account unless otherwise specified elsewhere in the contract.

2.7.7 In case the execution of works comes to a complete halt or reaches a stage wherein worthwhile works cannot be executed and there is no possibility of commencement of work for a period of not less than two months, due to reasons not attributable to the contractor and other than Force Majeure conditions, BHEL may consider permitting the contractor to de mobilize forthwith and re mobilize at an agreed future date. Cost of such demobilization/remobilization shall be mutually agreed. ORC (Over run Charges) in such cases shall not be applicable for the period between the period of demobilization and re mobilisation. The duration of contract/time extension shall accordingly get modified suitably. In case of any conflict, BHEL decision in this regard shall be final and binding on the contractor.

2.7.8 In the unforeseen event of inordinate delay in receipt of materials, drawings, fronts, etc, due to which inordinate discontinuity of work is anticipated, BHEL at its discretion may consider contractor's request to short close the contract, provided that the balance works are minor vis a vis the scope of work envisaged as per the contract. At the point of requesting for

short closure, contractor shall establish that he has completed all works possible of completion and he is not able to proceed with the balance works due to constraints beyond his control. In such a case, the estimated value of the unexecuted portion of work as mutually agreed, shall however be reduced from the final contract value.

2.7.9 LIQUIDATED DAMAGES/PENALTY

COMPENSATION FOR DELAY:

If the contractor fails to maintain the required progress in terms of condition 2.10 or to complete the work and clear the site on or before the contracted or extended the period of completion, he shall, without prejudice to any other right or remedy of the BHEL on account of such breach, pay as agreed compensation an amount calculated as stipulated below

For unfinished anticipated value of work where finished portion is fit for use

Rate of compensation as follows:

- Completion period (as originally stipulated) not exceeding 6 months.@ 1 percent per week
- Completion period (as originally stipulated) Exceeding 6 months and not exceeding 2 years...@ 0.5 percent per week
- Completion period (as originally stipulated) exceeding 2 years..... @ 0.25 percent per week

Provided always that the total amount of compensation for delay to be paid under condition shall not exceed the under noted percentage of the anticipated contract value

- Completion period (as originally stipulated) not exceeding 6 months.@ 10 percent of anticipated value of work
- Completion period (as originally stipulated) Exceeding 6 months and not exceeding 2 years...@ 7.5 percent of anticipated value of work
- Completion period (as originally stipulated) Exceeding 2 years.....@ 5 percent of anticipated value of work

The amount of compensation may be adjusted or set off against any sum payable to the Contractor under this or any other contract with the BHEL.

2.7.10 POST TECHNICAL AUDIT OF WORK AND BILLS: BHEL reserve the right to carry out a post-payment audit and technical examination of the work and final bill including all supporting vouchers, abstract etc., and to enforce recovery of any sums becoming due as a result thereof in the manner provided in the proceeding sub-paragraph's provided however that no such recovery shall be enforced after three years of passing the final bill

2.8 RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF LOCAL LAWS, EMPLOYMENT OF WORKERS ETC.

The following are the responsibilities of the contractor in respect of observance of local laws, employment of personnel, payment of taxes etc. The subcontractor shall fully indemnify BHEL against any claims of whatsoever nature arising due to the failure of the contractor in discharging any of his responsibilities hereunder:

2.8.1 The contractor at all times during the continuance of this contract shall, in all his dealings with local labour for the time being employed on or in connection with the work, have due regard to all local festivals and religious and other customs.

2.8.2 The contractor shall comply with all applicable State and Central Laws, Statutory Rules, Maternity act, Regulations etc. such as contract labour(R&A) Act 1970, Minimum wage Act 19748, Payment of wages Act 1936,ESI Act 1948, EPF Act 1952, Employees' compensation Act 1923, Provision of Companies Act 1948 & rules thereof, The interstate Migrant Workmen 1979, The Karnataka Factories Rules 1969, Payment of Bonus Act 1965, Payment of Gratuity Act 1972. Child labour Prohibition act 1986, Karnataka Minimum Wage Act , Prevention of sexual harassment at work place Act 2013, Guidelines/notification related to Safai Karamchari Act , Equal Remuneration Act 1976, The company's instructions as issued from time to time in regard to working hours, wages, leaves, holidays etc. for labour as may be enacted by the Government during the tenure of the Contract and having force or jurisdiction at Site. The Contractor shall also give to the local Governing Body, Police and other relevant Authorities all such notices as may be required by the Law.

The contractor shall produce the following registers and forms:

- *Form XIII- Register of work men employed by contractor(Rule 75)*
- *Form XIV- Employment Card issued by contractor(Rule 76)*
- *Form XVI- Muster Roll (Rule 78(1) (a)(i))*
- *Form XVII- Register of Wages (Rule 78(1) (a)(i))*
- *Form XVIII- Register of wages cum Muster Roll(in case of weekly payment)*
- *Form XIX- Wage slip (Rule 78(b))*
- *Form XX- Register of deduction for damages Or Loss Rule 78(1) (a)(ii))*
- *Form XXI- Register of files Rule 78(1) (a)(ii))*
- *Form XXII- Register of Advance Rule 78(1) (a)(ii))*
- *Form XXIII- Register of Overtime Rule 78(1) (a)(iii))*
- *Form XXIV- Return to be sent by the contractor to the Licensing officer (Rule 82(1))*

2.8.3 The contractor shall obtain independent License under the Contract Labour (Regulations and Abolition Act)as required from the concerned Authorities based on the certificate (Form-V) issued by the Principal Employer/Customer

2.8.4 *The contractor shall pay all taxes, fees, license charges, deposits, duties, tolls, royalties, commission or other charges which may be levied on account of his operations in executing the contract.*

2.8.5 *While BHEL would pay the inspection fees and Registration fees of Boiler & explosive/Electrical Inspectorate, all other arrangements for site visits periodically by the Inspectorate to site, Inspection certificate etc. will have to be made by contractor. However, BHEL will not make any payment to the Inspectorate in connection with contractor's Welders/Electricians qualification tests etc.*

2.8.6 *Contractor shall be responsible for provision of Health and Sanitary arrangements (more particularly described in Contract Labour Regulation & Abolition Act), Safety precautions etc. as may be required for safe and satisfactory execution of contract.*

2.8.7 *The contractor shall be responsible for proper accommodation including adequate medical facilities for personnel employed by him.*

2.8.8 *The contractor shall be responsible for the proper behavior and observance of all regulations by the staff employed by him.*

2.8.9 *The contractor shall ensure that no damage is caused to any person/property of other parties working at site. If any such damage is caused, it is responsibility of the contractor to make good the losses or compensate for the same.*

2.8.10 *All the properties/equipment/components of BHEL/their Client loaned with or without deposit to the contractor in connection with the contract shall remain properties of BHEL/their Client.*

2.8.11 *The contractor shall use such properties for the purpose of execution of this contract. All such properties/equipment/components shall be deemed to be in good condition when received by the contractor unless he notifies within 48 hours to the contrary. The contractor shall return them in good condition as and when required by BHEL/their Client. In case of non-return, loss, damage, repairs etc, the cost thereof as may be fixed by BHEL Engineer will be recovered from the contractor*

2.8.12 *Any delay in completion of works/or non-achievement of periodical targets due to the reasons attributable to the contractor, the same may have to be compensated by the contractor either by increasing manpower and resources or by working extra hours and/or by working more than one shift. All these are to be carried out by the contractor at no extra cost.*

2.8.13 *The contractor shall arrange, coordinate his work in such a manner as to cause no hindrance to other agencies working in the same premises.*

2.8.14 All safety rules and codes applied by the Client/BHEL at site shall be observed by the contractor without exception. The contractor shall be responsible for the safety of the equipment/material and works to be performed by him and shall maintain all light, fencing guards, slings etc. or other protection necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer with a view to prevent pilferage, accidents, fire hazards. Due precautions shall be taken against fire hazards and atmospheric conditions. Suitable number of Clerical staff, watch and ward, store keepers to take care of equipment/materials and construction tools and tackles shall be posted at site by the contractor till the completion of work under this contract. The contractor shall arrange for such safety devices as are necessary for such type of work and carry out the requisite site tests of handling equipment, lifting tools, tackles etc. as per prescribed standards and practices. Contractor has to ensure the implementation of Health, Safety and Environment (HSE) requirements as per directions given by BHEL/Customer. The contractor has to assist in HSE audit by BHEL/Customer and submit compliance Report. The contractor has to generate and submit record/reports as per HSE plan/activities as per instruction of BHEL/Customer. All tools, plant and equipment brought to the site shall become the property of BHEL and shall not be removed from the site without the prior written approval from BHEL. When the work is finally completed or the Contractor is determined for reasons other than the defaults of the contract, he shall forthwith remove from the site all tools, plants, equipment etc., (other than those as may have been provided by BHEL) and upon such removal, the same shall revert in, and become the property of the contractor.

2.8.15 The contractor will be directly responsible for payment of wages to his workmen on specified date of respective month declared as per applicable Labour Act. A pay roll sheet giving all the payments given to the workers and duly signed by the contractor's representative should be furnished to BHEL site for record purpose.

2.8.16 In case of any class of work for which there is no such specification as laid down in the contract, such work shall be carried out in accordance with the instructions and requirements of the Engineer.

2.8.17 Also, no idle charges will be admissible in the event of any stoppage caused in the work resulting in contractor's labour and Tools & Plants being rendered idle due to any reason at any time.

2.8.18 The contractor shall take all reasonable care to protect the materials and work till such time the plant/equipment has been taken over by BHEL or their Client whichever is earlier.

2.8.19 The contractor shall not stop the work or abandon the site for whatsoever reason of dispute, excepting force majeure conditions. All such problems/disputes shall be separately discussed and settled without affecting the progress of work. Such stoppage or abandonment shall be treated as breach of contract and dealt with accordingly

2.8.20 *The contractor shall keep the area of work clean and shall remove the debris etc. while executing day-to-day work. Upon completion of work, the contractor shall remove from the vicinity of work, all scrap, packing materials, rubbish, unused and other materials and deposit them in places specified by the Engineer. The contractor will also demolish all the hutments, sheds, offices, etc. constructed and used by him and shall clean the debris. In the event of his failure to do so, the same will be arranged to be done by the Engineer and the expenses recovered from the contractor. If the work is executed in Factory premises, no hutment will be allowed.*

2.8.21 *The contractor shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and timely execution shall be the essence of this contract. The contractor shall be responsible to ensure that the quality, assembly and workmanship conform to the dimensions and clearance given in the drawings and/ or as per the instructions of the Engineer.*

2.8.22 *The Contractor to note that some of BHEL's T&Ps/MMDs may not be insured. The Contractor will take necessary precautions and due care to protect the same while in his custody from any damage/ loss till the same is handed over back to BHEL. In case the damage / loss is due to carelessness/ negligence on the part of the contractor, the Contractor is liable to get them repair/ replaced immediately and in case of his failure to do so within a reasonable time, BHEL will reserve the right to recover the loss from the contractor.*

2.8.23 *The contractor shall provide all watchmen necessary, for the protection of the site, the work, the materials, the tools , plant, equipment and anything else lying on the site during the progress of the work. He shall solely be responsible for and shall take all reasonable and proper steps for protecting, securing , lighting and watching all places on or about the work and the site which may be dangerous to any person whom so ever.*

2.8.24 **SITE DRAINAGE:** All water that may accumulate on the site during the process of the work, or in trenches and excavations shall be removed to the entire satisfaction of the Engineer-in-charge and at Contractors expense.

2.8.25 **INSPECTION OF THE WORK:** BHEL Officers concerned with the Contract shall have power at any time to inspect and examine any part of the work and the contractor shall give such facilities as may be required to given for such inspection and examination.

2.8.26 *In case the contractor is required to undertake any work outside the scope of this contract, the rates payable shall be those mutually agreed upon if the item rates are not mentioned in existing contract*

i. For any item of work required to be carried out after the contract has been awarded and which is not covered by Contractors Schedule but is covered by C.P.W.D. schedule of rates the rate payable for such a fresh item will be derived from updated C.P.W.D. schedule of rates by the method of proportion as follows:

- ii. Rate as per estimated updated C.P.W.D DSR and loading tender excess (plus or minus) on pro-rata basis for nearest analogous items. For other items rate as per estimated C.P.W.D DSR and loading tender excess(plus or minus)*
- iii. If rates are not available in C.P.W.D. DSR, deviated item rates will be derived from market rate with 15% profit and overheads.*

2.9 PROGRESS MONITORING, MONTHLY REVIEW AND PERFORMANCE EVALUATION

2.9.1 A detailed plan/programme for completion of the contractual scope of work as per the time schedule given in the contract shall be jointly agreed between BHEL and Contractor, before commencement of work . The above programme shall be supported by month wise deployment of resources viz Manpower, T&P, Consumables, etc. Progress will be reviewed periodically (Daily/Weekly/Monthly) vis a vis this jointly agreed programme. The Contractor shall submit periodical progress reports (Daily/Weekly/Monthly) and other reports/information including manpower, consumables, T&P mobilization etc as desired by BHEL.

2.9.2 Monthly progress review between BHEL and Contractor shall be based on the agreed programme as above, availability of inputs/fronts etc, and constraints if any, as per prescribed formats. Manpower, T&P and consumable reports as per prescribed formats shall be submitted by contractor every month. Release of RA Bills shall be contingent upon certification by BHEL Site Engineer of the availability of the above prescribed formats duly filled in and signed.

2.9.3 The burden of proof that the causes leading to any shortfall is not due to any reasons attributable to the contractor is on the contractor himself. The monthly progress review shall record shortfalls attributable to (i) Contractor, (ii) Force Majeure Conditions, and (iii) BHEL

2.10 TIME OF COMPLETION

2.10.1 Time is essence of the contract. The time schedule shall be as prescribed in the Contract. The time for completion shall be reckoned from the date of commencement of work at Site as certified by BHEL Engineers

2.10.2 The entire work shall be completed by the contractor within the time schedule or within such extended periods of time as may be allowed by BHEL under clause 2.11

2.11 EXTENSION OF TIME FOR COMPLETION

2.11.1 If the completion of work as detailed in the scope of work gets delayed beyond the contract period, the contractor shall request for an extension of the contract and BHEL at its discretion may extend the Contract.

2.11.2 *Based on the monthly reviews jointly signed, the works balance at the end of original contract period less the backlog attributable to the contractor shall be quantified, and the number of months of 'Time extension' required for completion of the same shall be jointly worked out. Within this period of 'Time extension', the contractor is bound to complete the portion of backlog attributable to the contractor. Any further 'Time extension' or 'Time extensions' at the end of the previous extension shall be worked out similarly.*

2.11.3 *However if any 'Time extension' is granted to the contractor to facilitate continuation of work and completion of contract, due to backlog attributable to the contractor alone, then it shall be without prejudice to the rights of BHEL to impose penalty/LD for the delays attributable to the contractor, in addition to any other actions BHEL may wish to take at the risk and cost of contractor.*

2.11.4 *A joint programme shall be drawn for the balance amount of work to be completed during the period of 'Time Extension', along with matching resources (with weightages) to be deployed by the contractor as per specified format. Review of the programme and record of shortfall shall be done every month of the 'Time extension' period in the same manner as is done for the regular contract period.*

2.11.5 *During the period of 'Time extension', contractor shall maintain their resources as per mutually agreed program*

2.11.6 *At the end of total work completion as certified by BHEL Engineer, and upon analysis of the total delay, the portion of time extensions attributable to (i) Contractor, (ii) Force majeure conditions, and (iii) BHEL, shall be worked out and shall be considered to be exhausted in the same order. The total period of time extensions shall be the sum of (i), (ii) and (iii) above and shall be equal to period between the scheduled date of completion and the actual date of completion of contract. LD shall be imposed/levied for the portion of time extensions attributable to contractor and recoverable from the dues payable to the contractor.*

2.12 OVERRUN COMPENSATION (THIS CLAUSE IS NOT APPLICABLE IN BHEL FACTORY & TOWNSHIP PREMISES)

2.12.1 *Over Run Compensation (ORC) is payable by way of rate revisions for periods beyond original, contract period subject to the following terms and conditions.*

2.12.2 *Rates shall be increased by 10% for the first twelve months of one or more extensions beyond original contract period. For the next twelve months of further extensions if any, rates shall be increased as above by 10% over the previous twelve months, and similarly for each subsequent twelve months extension.*

2.12.3 Should there be any 'Time extension' for reasons attributable only to the contractor, then the work shall be executed by the contractor at the rates applicable for the period the work was planned

2.12.4 Payment of ORC shall be regulated as follows:

i) Contractor is entitled to Over Run Compensation (ORC) only for the portion of backlog attributable to BHEL.

ii) 50% of the compensation is allocated for deployment of resources agreed as per the joint programme drawn vide 2.11.4. Payment shall however be based on the actual deployment of resources for the month as certified by BHEL, as per weightages assigned therein

iii) 50% of the compensation, is allocated for achieving of planned progress agreed as per the joint programme drawn vide 2.11.4. Payment shall be on pro rata basis for actual achieved quantities

iv) Total Over Run Compensation shall be limited to 10% of the executed contract value as certified in Final Bill. For this purpose executed contract value excludes PVC, ORC, Supplementary/Additional Items and Extra Works done on Man-day rate basis

2.12.5 Contractor shall not be entitled for any Over Run Compensation (ORC) for the portion of backlog attributable to the contractor. Such works shall be executed at the rates applicable for the period the work was planned

2.13 QUANTITY VARIATION

2.13.1 The quoted rates shall remain firm irrespective of any variations in the individual quantities.

2.14 EXTRA WORKS

2.14.1 All rectifications/modifications, revamping, and reworks required for any reasons not attributable to the contractor, or needed due to any change in deviation from drawings and design of equipment, operation/maintenance requirements, mismatching, or due to damages in transit, storage and erection/commissioning, and other allied works which are not very specifically indicated in the drawings, but are found essential for satisfactory completion of the work, will be considered as extra works.

2.14.2 Extra works arising on account of the contractor's fault, irrespective of time consumed in rectification of the damage/loss, will have to be carried out by the contractor free of cost. Under such circumstances, any material and consumable required for this purpose will also have to be arranged by the contractor at his cost.

2.14.3 All the extra work should be carried out by a separately identifiable gang, without affecting routine activities. Daily log sheets in the pro-forma prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered/entertained in the absence of the said supporting documents i.e. daily log sheets. Signing of log sheets by BHEL engineer does not necessarily mean the acceptance of such works as extra works.

2.14.4 BHEL retains the right to award or not to award any of the major repair/ rework/modification/rectification/fabrication works to the contractor, at their discretion without assigning any reason for the same

2.14.5 After eligibility of extra works is established and finally accepted by BHEL engineer/designer, payment will be released on competent authority's approval at the following rate.

MAN-HOUR RATE FOR ELIGIBLE EXTRA WORKS: Single composite average labour man-hour rate, including overtime if any, supervision, use of tools and tackles and other site expenses and incidentals, consumables for carrying out any major rework/ repairs/ rectification/ modification/ fabrication as certified by site as may arise during the course of erection, testing, commissioning or extra works arising out of transit, storage and erection damages, payment , if found due will be as per applicable minimum wage act

2.14.6 The above composite labour man hour rate towards extra works shall remain firm and not subject to any variation during execution of the work. PVC will not be applicable for extra works. Rate revision, Over Run Charges/compensation etc will not be applicable due to extra works.

2.14.7 Extra Works for Civil Packages shall be regulated as follows

i) Rates for Extra Works arising due to (1) non availability of BOQ (Rate Schedule), OR (2) change in Specifications of materials/works (3) rectification/modification/dismantling & re erecting etc due to no fault of Contractor, shall be in the order of the following:

a) Item rates are to be derived from similar nature of items in the BOQ (Rate Schedule) with applicable escalation derived from All India Consumer Price Index for Whole Sale Commodities.

b) As per applicable updated CPWD-DSR (or latest edition) with applicable escalation derived, Notification issued by the office of CPWD for 'Cost Index' in that Region where the project is being executed,

c) Item rates are to be worked out on the basis of prevailing market rates mutually agreed between BHEL and Contractor, plus 15% towards Contractor's overheads and profit.

ii) PVC and ORC will not applicable be for (i) above.

2.15 SUPPLEMENTARY ITEMS

2.15.1 For NON Civil Works

Supplementary items are items/works required for completion of entire work but not specified in the scope of work. Subject to certification of such items/works as supplementary items by BHEL Engineer, rates shall be derived on the basis of any one of the following on mutual agreement:

- i) Based on percentage breakup/rates indicated for similar/nearby items
- ii) In case (i) above does not exist, then BHEL/site may derive the percentage breakup/rates to suit the type of work

2.15.2 For Civil Works

i) Rates for Supplementary Works/Additional Works arising out due to additions/alterations in the original scope of works as per contract subject to certification of BHEL Engineer shall be worked out as under:

a) Item rates which are available in existing BOQ (Rate Schedule) shall be operated with applicable escalation derived from All India Consumer Price Index for Whole Sale Commodities

b) Items of works which are not available in existing BOQ shall be operated as an 'Extra Works' and rate shall be derived as per clause no 2.14

ii) Execution of Supplementary Works/Additional Works through the Contractor shall be at the sole discretion of BHEL, and shall be considered as part of executed contract value for the purpose of Quantity Variation as per clause 2.13

iii) BHEL Engineer's decision regarding fixing the rate as above is final and binding on the contractor.

iv) PVC and ORC will not be applicable for (i) above.

2.16 STRIKES & LOCKOUT

2.16.1 The contractor will be fully responsible for all disputes and other issues connected with his labour/employee. In the event of the contractor's labour/employee resorting to strike or the Contractor resorting to lockout and if the strike or lockout declared is not settled within a period of 15 days, BHEL shall have the right to get the work executed through any other

agencies and the cost so incurred by BHEL along with Overhead charges of 35% shall be deducted from the Contractor's bills along with overhead of 35%

2.16.2 *For all purposes whatsoever, the employees of the contractor shall not be deemed to be in the employment of BHEL*

2.17 FORCE MAJEURE

The following shall amount to Force Majeure:-

2.17.1 *Acts of God, act of any Government, War, Sabotage, Riots, Strike, Civil commotion, Police action, Revolution, Flood, Fire, Cyclones, Earth quake and Epidemic and other similar causes over which the contractor has no control.*

2.17.2 *If the contractor suffers delay in the due execution of the contractual obligation due to delays caused by force majeure as defined above, the agreed time of completion of the job covered by this contract or the obligations of the contractor shall be extended by a period of time equal to period of delay, provided that on the occurrence of any such contingency, the contractor immediately reports to BHEL in writing the causes of delay and the contractor shall not be eligible for any compensation.*

2.18 ARBITRATION & RECONCILIATION

2.18.1 *In case amicable settlement is not reached in the event of any dispute or difference arising out of the execution of the Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision by the Contractor in any manner touching upon the Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred to the sole arbitration of the arbitrator appointed by BHEL/In charge.*

The award of the Arbitrator shall be binding upon the parties to the dispute Subject as aforesaid, the provisions of Arbitration and Reconciliation Act 1996 (India) or statutory modifications or reenactments thereof and the rules made there under and for the time being in force shall apply to the arbitration proceedings under this clause. The venue of the arbitration shall be the place from which the contract is issued or such other place as the Arbitrator at his discretion may determine

2.18.2 In case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred to by either party to the arbitration of one of the arbitrators in the department of public enterprises. The award of the arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the parties hereto finally and conclusively.

2.18.3 The cost of arbitration shall be borne equally by the parties.

2.18.4 Work under the contract shall be continued during the arbitration proceedings

2.19 PAYMENTS

Payments to Contractors are made in any one of the following forms

2.19.1 Running Account Bills (RA Bills)

i) These are for interim payments when the contracts are in progress. The bills for such interim payments are to be prepared by Contractor in prescribed formats (RA Bill forms).

ii) Payments shall be made according to the extent of work done as per measurements taken up to the end of the calendar month and in line with the terms of payments described in the Tender documents along with relevant statutory documents applicable for the work.

iii) Recoveries on account of electricity, water, statutory deductions, etc are made as per terms of contract

iv) Full rates for the work done shall be allowed only if the quantum of work has been done as per the specifications stipulated in the contract. If the work is not executed as per the stipulated specifications, BHEL may ask the contractor to re do the work according to the required specifications, without any extra cost. However, where this is not considered necessary 'OR' where the part work is done due to factors like non-availability of material to be supplied by BHEL 'OR' non availability of fronts 'OR' non availability of drawings, fraction payment against full rate, as is considered reasonable, may be allowed with due regard for the work remaining to be done. BHEL decision in this regard will be final and binding on the contractor.

v) In order to facilitate part payment, BHEL Site Engineer at his discretion may further split the contracted rates/percentages to suit site conditions, cash flow requirements according to the progress of work

2.19.2 Final Bill

Final Bill' is used for final payment on closing of Running Account for works or for single payment after completion of works. Final Bill' shall be submitted as per prescribed format after completion of works as per scope and upon material reconciliation, along with the following.

- i) 'No Claim Certificate' by contractor
- ii) Clearance certificates where ever applicable viz Clearance Certificates from Customer, various Statutory Authorities like Labour department, PF Authorities, Commercial Tax Department, etc
- iii) Indemnity bond as per prescribed format BHEL shall settle the final bills after deducting all liabilities of Contractor to BHEL

2.20 PERFORMANCE GUARANTEE FOR WORKMANSHIP

2.20.1 Even though the work will be carried out under the supervision of BHEL Engineers the Contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of as mentioned in the contract/NIT from the date of commencement of guarantee period as defined in Technical Conditions of Contract, for good workmanship and shall rectify free of cost all defects due to faulty erection detected during the guarantee period. In the event of the Contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works at the Contractor's risk and cost, without prejudice to any other rights and recover the same from the balance security deposit.

2.20.2 BHEL shall release the balance security deposit subject to the following

- i) Contractor has submitted 'Final Bill'
- ii) Guarantee period as per contract has expired
- iii) Contractor has furnished 'No Claim Certificate' in specified format
- iv) BHEL Site Engineer/Construction Manager has furnished the 'No Demand Certificate' in specified format

v) Contractor has carried out the works required to be carried out by him during the period of Guarantee and all expenses incurred by BHEL on carrying out such works is included for adjustment from the Guarantee money refundable.

2.21 CLOSING OF CONTRACTS

The Contract shall be considered completed and closed upon completion of all contractual obligations and settlement of Final Bill or completion of Guarantee period whichever is later. Upon closing of Contract, BHEL shall issue a completion certificate as per standard format, based on specific request of Contractor.

2.22 REVERSE AUCTION/PRICE BID OPENING:

- *BHEL reserves the right to go for reverse auction at any point of time before opening of Price Bid.*
- *Bids with non-acceptance of reverse auction will be liable for rejection.*
- *Opening of Price Bid at discretion of BHEL.*
- *BHEL shall be at liberty to cancel the tender at any time, before ordering, without assigning any reason.*

2.23 SUSPENSION OF BUSINESS DEALINGS

BHEL reserves the right to take action against Contractors who either fail to perform or Tenderers/Contractor who indulge in malpractices, by suspending business dealings with them in line with BHEL guidelines issued from time to time.

2.24 OTHER ISSUES

2.24.1 *Value of Non judicial Stamp Paper for Bank Guarantees and for Contract Agreement shall be not less than Rs 200/- unless otherwise required under relevant statutes.*

2.24.2 *In case of any conflict between the General Conditions of Contract and Special Conditions of Contract, provisions contained in the Special Conditions of Contract shall prevail.*

2.24.3 *Unless otherwise specified in NIT, offers from consortium/JVs shall not be considered.*

2.24.4 *BHEL may not insist for signing of Contract Agreements in respect of low value and short time period contracts*