

	PPX-BOI DEPARTMENT BHARAT HEAVY ELECTRICALS LIMITED HEEP: HARDWAR-249 403 (Uttarakhand) TEL: +91 1334 28 4175	PACKAGE: OIL MODULE PROJECT: 1X800 MW DARLIPALI
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Overview of Oil Module (Doc. No.: 4-11939-S5811 Rev01 dt. 05/03/2025) <u>(Complete Specifications will be furnished to suppliers only against exchange of signed FCA (Framework Confidentiality Agreement) with BHEL)</u>	Pg. No. 02 to 05
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1. OVERVIEW OF OIL MODULE

Oil Module has the following functions:-

- To supply lubrication oil to steam turbine bearings.
- To filter lubrication oil

Oil Module consists of the following equipments whose technically binding parameters are informed to vendors in purchase specification:-

MAIN OIL TANK (MOT): This is a reservoir to store oil. Upon return from bearings, oil comes inside MOT where it is made to de-aerate itself by use of an internal baffle plate inside MOT. On the top of MOT are mounted many other equipments such as pumps, oil mist eliminator etc. During operation of pumps and oil mist eliminator, tank is subject to vibration loads. Tank is also subject to load of fluid. Complete design and fabrication of the Main Oil Tank is in scope of Oil Module supplier. Seismic requirements are also to be factored in while designing of tank. Size of Main Oil Tank is given in Clause No. 4. During normal operation, the tank is filled with Oil which is Turbine Oil ISO VG46. Further details of this Oil may be requested from BHEL by vendor. Tank is designed for re-circulation frequency of oil <8.4.

MAIN OIL PUMP (MOP): 2 X 100% vertical centrifugal Main Oil Pumps + their AC Motors are installed on top of MOT. These run 24x7 and are used to supply lube oil to bearings of Turbine-Generator set during normal operation. Make and model number is mentioned in purchase specification.

EMERGENCY OIL PUMP (EOP): One no. or two nos. vertical centrifugal Emergency Oil Pump + its DC motor is installed on top of MOT. It is used to supply lube oil to bearings during emergency operation. Make and model number is mentioned in purchase specification.

LIFTING OIL PUMP (JOP): 2 X 100% horizontal positive displacement (vane type) Lifting Oil Pump + their motors are installed on top of MOT. It is used to supply oil to bearings to lift Steam Turbine rotor train. Make and model number is mentioned in purchase specification. The circuit of Lifting Oil Pump is referred to as Lifting Oil Line. Rest all lines are named as lube oil lines.

LUBE OIL AND LIFTING OIL FILTER: 2 x 100% duplex type filters are installed in both the lube oil line and lifting oil line. Make and model number is mentioned in purchase specification.

OIL MIST ELIMINATOR (OME): 2 x 100% Oil Mist Eliminator (a.k.a Oil Vapor Exhauster) serves to suck oil+vapor mixture from the turbine bearing system as well as MOT. Make and model number is mentioned in purchase specification.

3-WAY TEMPERATURE CONTROL VALVE: This is a motorized valve and has two inlet ports (one each for hot and cold oil) and one outlet port. This is a mixing type of valve. Also opening and closing of hot and cold inlet ports is automated to achieve a constant outlet flow at a desired set temp.. Make and model number is mentioned in purchase specification.

INTERCONNECTING PIPING: The interconnecting piping can be broadly divided into following 5 system:-

- Lube Oil Supply System Piping
- Lifting Oil Piping
- Oil Return Piping
- Oil Vapor Exhaust Piping
- Drain Piping.

The design of Lifting Oil Piping is critical to Oil Module and is important.

For the purpose of this enquiry, the Oil Module mentioned in this document is meant and understood. Other Oil Modules are not meant and not understood.

Worked & Checked	HS DOGRA/SM-STE(TL)	<i>Signature</i> 5/3/25
Approved	A JAIN/SDGM-STE(TL)	<i>Signature</i> 5/3/25
	Name	



A photograph of Oil Module is shown below for better understanding.

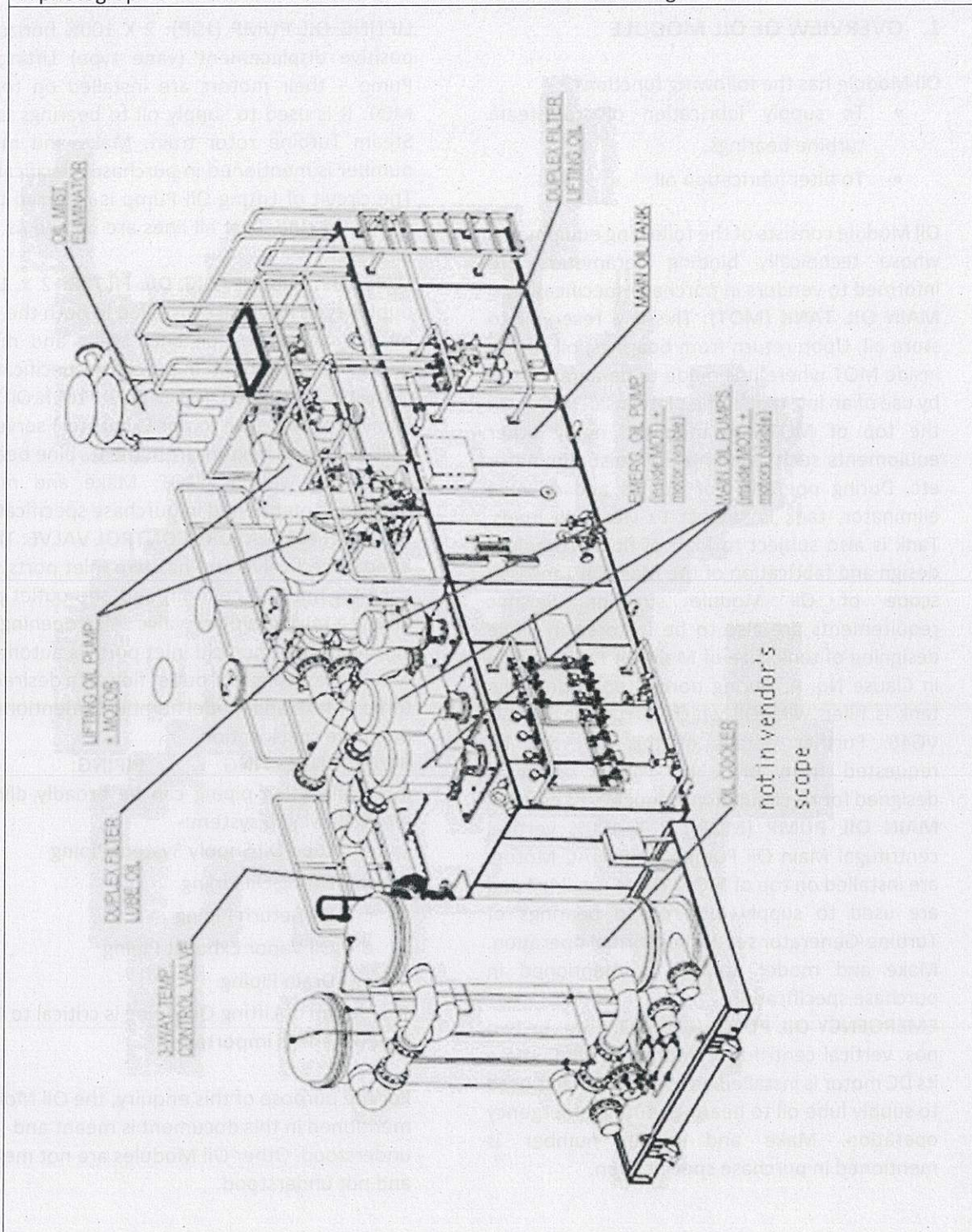


Figure-1: Photograph showing requirement of items in Oil Module. Oil Cooler is shown here, but it is not part of Oil Module.

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	Name



OVERVIEW OF OIL MODULE

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Table-1 below shows system requirement at the interfaces.

Description	Medium	Pressure		Temperature	
		Operating (bar)	Design (bar)	Operating (°C)	Design (°C)
Lube Oil Pipes	Oil	6	8	50	80
Lifting Oil Pipes	Oil	175	200*	70	80
Return Oil Pipes	Oil	De-pressurised	2.5	70	80
Oil Vapor Exhaust Pipes	Air and Oil Particles	slight vacuum	2.5	70	80
* A safety margin for piping wall thickness shall be used here, with design for 250bar to accommodate loads other than design parameters.					
TABLE-1: system requirement at the interfaces					

2. NOMENCLATURE OF OIL MODULE

Refer following table for Nomenclature of Oil Modules.

Module Size	Volume of Oil Inside tank during normal operation (m ³)	Volume of Tank (m ³)	Nominal Size of Tank	Lube Oil Flow rate (liter per sec)	Approx. dimensions of tank (L x b x h) in meters
M	19	28	19/28	>27.7...≤44.4	6.95 x 3 x 1.7
L1	24	38	24/38	>44.4...≤55.5	7.8 x 3 x 2
L2	32	45	32/45	>55.5...≤69.4	9.2 x 3 x 2
TABLE 2: Nomenclature of Oil Module					

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	Name	
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3. DESIGN

i. Design of Oil Module and Main Oil Tank is in scope of Oil Module supplier. As the tank is an integral part of the module structure, which shall endure heavy loads during lifting and transportation, static calculation shall be performed for the entire structure. In all cases the bottom of the module shall be oil-tight. Attention shall be paid to the specific conditions (e.g. seismic requirements). Vendor should have experience of design according to DIN 6625 Part 2 or equivalent standard. The following is an indicative, not exhaustive, list of aspects to be considered in analysis of Oil Tank:

- a. Full scale equipment modelling on the tank.
- b. Equipment lifting analysis.
- c. Earthquake analysis with oil.
- d. Load case combination application.
- e. Detailed model analysis.
- f. Harmonic analysis (for different load cases).
- g. Superimposition of results of model analysis to Harmonic analysis
- h. Finding of worst case scenario.
- i. Finalizing of Oil Module configuration.

BHEL expresses no claim as to exhaustiveness of above aspects. It shall be vendor's responsibility to understand equipment's requirement completely and comprehensively; The responsibility of correct design, and hence correct functioning/operation of the Oil Module at site, rests with Oil Module supplier.

ii. Design of piping is in scope of supplier. Vendor should have experience of stress-analysis of piping according to ASME B31.1 or equivalent standard including Seismic analysis.

Vendor should have experience of pressure drop calculations across pipe lengths. High operational pressure with considerable pressure fluctuations and small pipe diameters with susceptibility to vibration excitation are the characteristic features of the lift oil pipe system. From this, results the necessity that all elements of the lift oil pipe system must thoroughly be designed against static and fluctuating internal pressure and that the arrangement of pipe supports must satisfy the contradictory criteria of vibration suppression and limitation of the loads due to thermal expansion and movements at the pipe's terminal points.

iii. The design of Oil Module and Main Oil Tank must be done ensuring structural stability and operational ability for required lifetime of 25 years.

iv. It shall be ensured that integrity of structure is not compromised (eg. Issues like excessive vibrations etc are not there). The responsibility of correct design, and hence correct functioning/operation of the Oil Module at site, rests with Oil Module supplier. Understanding the design requirements complete and comprehensively shall be vendor's responsibility.

v. The make and model numbers of major items such as Main Oil Pump, Emergency Oil Pump, Lifting Oil Pump, motors of these pumps, Oil Mist Eliminator, filters, important valves etc. are mentioned in the specification.

Revision History

1. Rev01 / 05.03.25: Table 2 updated.

Worked & Checked	HS DOGRA/SM-STE(TL)	<i>Heugh</i> 9/3/25
Approved	A JAIN/SDGM-STE(TL)	<i>Ajain</i> 9/3/25
	Name	

Framework Confidentiality Agreement cum Undertaking

This Agreement made on this the _____ day of (month) _____ 20____
("Effective Date") by and between
M/s BHARAT HEAVY ELECTRICALS LIMITED, having registered office at "BHEL
House", Siri Fort, New Delhi – 110049 (India), acting through its _____ Unit
(hereinafter may be referred to as "BHEL" or "the Company").

And

M/s _____ (address) _____
represented by authorized representative Sri _____ (herein after
referred to as the "Supplier").

The Supplier and the Company may, unless the context otherwise requires, hereinafter be
collectively referred to as "Parties" or singly as the "Party".

RECITALS

Whereas, BHEL is engaged in the design, engineering, manufacturing, construction, testing,
commissioning and servicing of a wide range of products, systems and services for the core
sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable
energy, Oil & Gas and Defence and providing associated services to varied customers in
relation to which BHEL/its affiliates own valuable information of a secret and confidential
nature.

Whereas the Company may, in connection with Contract(s) (as defined hereunder) placed or
to be placed upon the Supplier, or otherwise, from time to time, make available, Technical
Information as is defined hereunder.

And Whereas BHEL is willing to provide such Technical Information to the Supplier from
time to time and the Supplier understands and acknowledges that such Technical Information
is valuable for the Company and as such is willing to protect confidentiality of such
information, subject to the terms and conditions set out hereunder.

Now therefore, in view of the foregoing premises and in consideration of the mutual
covenants and agreements hereinafter set forth, the Parties agree as under:

1. Definitions:

Unless the context so requires, in this Agreement, the following terms will bear the meaning
ascribed to the said term in this clause.

- A. **"Contract"** means the Contract entered into with a Supplier and includes a Purchase
Order, or a Work Order for procurement of any goods or for provision of any services.
- B. **"Effective Date"** means the date of this Agreement as mentioned in the preamble of
this Agreement.

- C. **“Supplier”** includes a Contractor or a Vendor of the Company whether for supplying of goods or for providing any services under a Contract or both.
 - D. **“Technical Information”** includes Drawings, and/or Product Standards and/or Specifications and/or Corporate / Plant Specifications and/or Technological Process Sheets and/or Technical Data Sheets and/or Jigs & Fixtures and/or Pattern & Dies and/or Special Gauges and/or Tools etc. belonging to or wherein the Company has acquired from a third party a right of user and includes any improvement thereto from time to time whether carried out by the Company or by the Supplier.
 - E. **“Intended Purpose”** means the purpose for which the Technical Information is provided to the Supplier under or in connection with a Contract.
 - F. **“Improvement”** includes any modification made to, or adaptation of, the Technical Information which enhances or is calculated to enhance the performance (whether in terms of effectiveness or in terms of efficiency or both) of the product and/or the service to be provided by the Supplier under a Contract.
2. This Agreement shall come into force/deemed to have come into force, as the case may be, on the Effective Date; or, on the first date when the Technical Information or any part thereof is provided by BHEL to the Supplier; whichever is earlier.
3. **Agreement deemed to be incorporated in each Contract:** Unless and to the extent otherwise stipulated in the Contract, the conditions of this Agreement are deemed to be incorporated in all Contracts which may be entered into between the Company and the Supplier. Further, unless otherwise stipulated, the obligations under this Agreement are and will be independent of the obligations under the Contracts and such obligations of the Supplier hereunder will remain of full effect and validity notwithstanding that the period of validity of the Contracts has expired by efflux of time stipulated therein; or, the contract has been discharged by performance or breach; or, the termination of the Contracts for any reason whatsoever.
4. **Ownership:**
- 4.1 The Company may, from time to time, make available to the Supplier, Technical Information on a non-exclusive basis by way of loan.
- 4.2 The Supplier acknowledges and agrees that all Technical Information and copies thereof that are or may be provided by the Company to the Supplier, are and shall remain the property of BHEL or that of the concerned entity from whom BHEL has obtained the Technical Information and such Technical Information are and shall constitute trade secrets of the BHEL. Nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any patent, copyright or design or any other intellectual property rights of whatsoever description that subsists or may hereinafter exist in the Technical Information. Furthermore, nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any license or rights of use of such patent, copyright or design or any other

intellectual property rights of whatsoever description which may now or hereafter exist in the Technical Information except for use of the Technical Information strictly in accordance with this Agreement and the Contract and/or as directed in writing by the Company, solely for the Intended Purpose under the Contract.

4.3 Neither Party is obligated by or under this Agreement to purchase from or provide to the other Party any service or product and that any such purchase/sale of any product and/or service by one Party to the other Party will be governed by the Contract if any, that may be entered into by and between the Company and the Supplier.

4.4 The Supplier is/has been made well aware and acknowledges that the Technical Information being/which may be shared with it by the Company has been either generated by the Company by incurring huge investment and cost or obtained from foreign collaborators under Technical Collaboration Agreement (TCA) with stringent confidentiality conditions.

4.5 The Supplier agrees and undertakes to adhere to confidentiality requirements as applicable to BHEL under a TCA and also ensure that the confidentiality requirements are adhered to by all its concerned employees or sub-contractors/suppliers (where permitted to be engaged by BHEL). Any damages, losses, expenses of any description whatsoever, arising out of or in connection with a breach of the confidentiality requirements under a TCA owing to any act or omission on the part of the Supplier or its employees or sub-contractors/suppliers that is claimed by a foreign collaborator from the Company shall be wholly borne by the Supplier and it shall keep BHEL fully indemnified in this behalf. The demand by the Company shall be conclusive upon the Supplier who shall thereupon forthwith pay to the Company without demur, dispute or delay the amount as demanded without demanding any further proof thereof.

4.6 The Supplier agrees and undertakes that unless so decided and advised by the Company in writing all rights/title to any Improvement to the Technical Information shall vest in the Company. The Supplier undertakes and agrees to inform forthwith to the Company of any such Improvement made to the Technical Information and transfer all drawings/documents or other materials connected with such Improvement to the Company and also agrees to fully cooperate with the Company for protecting the Company's interests in such Improvement in the Technical Information including but not limited to obtaining necessary protection for the intellectual property rights in such improvement, if so desired by the Company. If a question arises whether a modification amounts to Improvement to the Technical Information, the same shall be decided by the Company and such decision shall be final and binding upon the Supplier.

5. Use and Non-Disclosure:

5.1 Unless otherwise stipulated by the Company, all Technical Information made available to the Supplier, by the Company shall be treated as Confidential irrespective of whether the same is marked or otherwise denoted to be Confidential or not.

- 5.2 The Supplier undertakes and agrees that the Technical Information in its possession shall be held in strict confidence and will be used strictly in accordance with this Agreement and solely for the Intended Purpose under the Contract. Use of the Technical Information for any other purpose other than Intended Purpose is prohibited.
- 5.3 In particular, the Supplier shall not use Technical Information or any Improvement in its possession for the manufacture or procurement of the Product(s) or components or parts thereof or use the Technical Information or any portion thereof or any modification or adaptation thereof in any form to provide any product and/or service to any third party, without the prior written consent of the Company.
- 5.4 The Supplier shall not disclose any of such Technical Information to any third party without the prior written consent of the Company. The Supplier agrees that without prior written consent of the Company, the Supplier shall not disclose to a third party about the existence of this Agreement, or of the fact that it is/was in possession of or has experience in the use of any Technical Information nor shall the Supplier share in any manner whatsoever, with a third party, the name or details of any Contract(s) awarded by the Company to it or performed by the Supplier or the scope of work thereof or share any document or correspondence by and between the Company and the Supplier in or in connection with this Agreement or such Contract(s). Notwithstanding what is stated elsewhere, the overall responsibility of any breach of the confidentiality provisions under this Agreement shall rest with the Supplier.
- 5.5 The Supplier undertakes and agrees not to make copies or extracts of and not to disclose to others any or all of the Technical Information in its possession, except as follows:
- (a) The Supplier may disclose the Technical Information to such of its officers and employees strictly to the extent as is necessary for such officer or employee for the Intended Purpose, provided that the Confidential Information (or copies thereof) disclosed shall be marked clearly as the confidential and proprietary information of Company and that such officers and employees shall similarly be bound by undertakings of confidence, restricted use and non-disclosure in respect of the Technical Information. The Supplier shall be responsible for any breach of such confidentiality provisions by such officers and employees.
 - (b) With the prior written consent of Company, the Supplier may disclose for the Intended Purpose such Technical Information as is provided for in such consent to such of its professional advisers: consultants, insurers and subcontractors who shall be similarly bound by undertakings of confidence, restricted use and non-disclosure in respect of such Technical Information.
 - (c) The Supplier shall not be prevented to make any disclosure required by (i) order of a court of competent jurisdiction or (ii) any competent regulatory authority or agency where such disclosure is required by law, provided that where the Supplier

intends to make such disclosure, it shall first consult Company and take all reasonable steps requested by it to minimize the extent of the Technical Information disclosed and to make such disclosure in confidence and also shall cooperate with the Company in seeking any protective order or any other remedy from proper authority in this matter.

6. Exceptions:

The obligations of the Supplier pursuant to the provisions of this agreement shall not apply to any Confidential Information that:

- a) was/is known to, or in the possession of the Supplier prior to disclosure thereof by the Company;
- b) is or becomes publicly known, otherwise than as a result of a breach of this agreement by the Supplier.
- c) is developed independently of the Disclosing Party by the Supplier in circumstances that do not amount to a breach of the provisions of this Agreement or the Contract;
- d) is received from a third party in circumstances that do not result in a breach of the provisions of this Agreement.

7. The obligation of maintaining confidentiality of the Technical Information on each occasion, shall subsist for the entire duration during which the Technical Information / equipment is in possession of the Supplier and shall thereafter subsist for a further period of --- years from the date when the complete Technical Information has been returned to the Company and if Technical Information has been returned in portions on different dates then, the period of ---- years will be reckoned from the date when the last portion of the Technical Information has been returned. Notwithstanding the expiry of the confidentiality obligation, the obligation of the Supplier under clause 5.4 shall continue to subsist for a further period of ----- years.

8. Warranties & Undertakings:

a) The Supplier undertakes to ensure the due observance of the undertakings of confidence, restricted use and non-disclosure by its persons to whom it discloses or releases copies or extracts of the Technical Information.

b) The Supplier shall keep the Technical Information or improvement made therein properly segregated and not mix up the same with any other material/documents belonging to him/it or to any other third party.

c) The Supplier further undertakes that he/it shall not hypothecate or give on lease or otherwise alienate or do away with any of the Technical Information and/or equipment of the Company, made available to him/it, and undertakes that he/it shall hold the same as a trustee, in capacity of custodian thereof and use/utilise the same solely for the purpose of executing the Contract awarded by the Company.

d) The Supplier further undertakes that he/it shall return all the equipment and/or Technical Information as far as practicable in the same condition in which the same was made available to him/it by the Company together with any Improvement thereon and the documents connected with such Improvement, to the Company forthwith upon completion of the scope

of work or Contract for which such Technical Information was provided by the Company to it or as directed by the Company together with a confirmation by way of an affidavit or in such manner as directed by the Company that it has not retained any equipment and/or Technical Information/Improvement thereof. In case any such equipment and/or Technical Information or Improvement thereof shall remain in his possession or is not capable of being returned, the retention and use of such Technical Information or Improvement thereto shall continue to be governed by this Agreement.

e) The Supplier undertakes to indemnify the Company for all the direct, indirect and/or consequential losses, damages, expenses whatsoever including any consequential loss of business, profits suffered by the Company owing to breach by the Supplier of its obligations under this Agreement and/or the confidentiality requirements, if any, contained in the Contract and that the Supplier hereby agrees that the decision of the Company in all such or any such matter/s shall be final and binding on the Supplier. On mere written demand of the Company, the Supplier shall forthwith and without demur or delay pay to the Company any such sum as determined by the Company as the amount of loss or damage or expense which has been suffered by the Company. The Supplier agrees that the Company shall be entitled to withhold and appropriate any amount payable to the Supplier under any Contract then existing between the Company and the Supplier, in case the Supplier fails to make payment, in terms of the written demand, within 7 days thereof. Without prejudice to the foregoing actions, in respect to any breach of this Agreement, the Company shall be entitled to take any other action against the Supplier as per applicable laws, the Contract, Company's applicable policies, guidelines rules, procedures, etc.

9. Without prejudice to any other mode of recovery as may be available to the Company for recovery of the amount determined as due as per Clause 8(e) hereinabove, the Company shall have a right to withhold, recover and appropriate the amount due towards such losses, damages, expenses, from any amount due to the Supplier in respect of any other Contract (s) placed on him/it by any department/office/Unit/Division of the said Company.

10. Arbitration & Conciliation:

a) In case amicable settlement is not reached between the Parties, in respect of any dispute
or

difference or claim or controversy arising out of the formation, breach, termination, validity or execution of the Contract(or Agreement) 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, then, either Party may, by a notice in writing to the other Party refer such dispute or difference or controversy or claim, (except as to any matters, the decision of which is specifically provided for therein) to the sole arbitration by the arbitrator appointed by Head/In-Charge of the Unit/Division/Region.

b) The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties to the dispute.

c) Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India), or other 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 at ----- **(Insert the name of the city/town of the concerned BHEL Unit/Division).**

d) 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 to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. 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.

e) Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Supplier shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and expedition in a professional manner.

11. Governing Law & Jurisdiction:

This Agreement shall be governed by and be construed as per applicable Indian Laws in force at the relevant time.

Subject to clauses 10(a) and 10(d) hereinabove, all matters in connection with the subject agreement shall be subject to exclusive jurisdiction of Courts situated at -----**(insert the name of the place where the BHEL Unit/Division is located)**

SIGNATURE

WITNESSES

1.

Name

Address:

2.

Name:

Address: