

REQUEST FOR QUOTATION

	BHARAT HEAVY ELECTRICALS LIMITED Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 INDIA	RFQ NUMBER: SSV000086 RFQ DATE : 22.12.2017	Due Date/Day: 19.01.2018 FRI Time : 13:00 HRS Tender Box : Reception Area Opening Venue: NEW ENGG. BLDG
MMI:PU:RF:003 (address for communication) :		(for all correspondence) Purchase Executive : SAMIT SRIVASTAVA Phone : 26998850 Fax : 00918026989227 E-mail: samit@bheledn.co.in	

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	EN7389920715A1 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL's DCS. Other qualifying requirements and deliverables as per PS4182051 R00 for PROJECT-A1	1	ST	1	31.03.2018
2	EN7389920715A2 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL's DCS. Other qualifying requirements and deliverables as per PS4182051 R00 PROJECT-A2.	1	ST	1	31.03.2018
3	EN7389920715A3 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL's DCS. Other qualifying requirements and	1	ST	1	31.03.2018

TWO PART BID - SUBMIT TECHNICAL AND PRICE BID IN SEPARATE SEALED COVERS

NOTES :

- 1.This RFQ is Governed by :
 - a)INSTRUCTIONS TO BIDDERS/SELLERS(Doc No :BHEL:EDN:ITB-SHOP) available at **www.bheledn.com (RFQ-P0 Terms & Conditions)**
 - b)GENERAL CONDITIONS OF CONTRACT FOR PURCHASE(Doc no :BHEL:EDN:GCC-SHOP) available at **www.bheledn.com (RFQ-P0 Terms & Conditions)**
 - c)Any other specific Terms and Conditions mentioned.
2. Bidders / Representatives who would like to be present during opening of offers are required to furnish authorization letter for the same .
- * The HSN/SAC no mentioned against the line items in the RFQ are indicative only.

For and On behalf of BHEL.

SAMIT SRIVASTAVA
Control Equipment

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REQUEST FOR QUOTATION

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Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
	deliverables as per PS4182051 R00 PROJECT-A3.				
4	EN7389920715A4 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL's DCS. Other qualifying requirements and deliverables as per PS4182051 R00 PROJECT-A4.	1	ST	1	31.03.2018
5	EN7389920715A5 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL's DCS. Other qualifying requirements and deliverables as per PS4182051 R00 PROJECT-A5.	1	ST	1	31.03.2018
6	EN7389920715A6 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly	1	ST	1	31.03.2018

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SI No.	Description	Qty	Unit	Delivery qty	Delivery Date
	integrate with BHEL#s DCS. Other qualifying requirements and deliverables as per PS4182051 R00 PROJECT-A6.				
7	EN7389920715A7 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL#s DCS. Other qualifying requirements and deliverables as per PS4182051 R00 PROJECT-A7.	1	ST	1	31.03.2018
8	EN7389920715A8 GUI for Operator Training Simulator * HSN/SAC : 8538 Certificate Of Conformance Graphical User Interface tool for Operator Training Simulator and Service for developing models of Sub-Critical & Super-Critical thermal power plants and the tool shall have the capability to seamlessly integrate with BHEL#s DCS. Other qualifying requirements and deliverables as per PS4182051 R00 PROJECT-A8.	1	ST	1	31.03.2018

Total Number of Items - 8

- 1.
- 2.

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REQUEST FOR QUOTATION

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RFQ no. SSVM000086

Offer to be submitted in two part bids:

- a) Techno commercial bid
- b) Price bid

In case of bidder not registered in BHEL EDN, vendor registration to be completed before price bid opening.

L1 price will be worked out on overall basis as per par 1.05.01 of PS4182051



**PURCHASE SPECIFICATION OF
GRAPHICAL USER INTERFACE TOOL & SERVICES
FOR OPERATOR TRAINING SIMULATOR**

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**SPECIFICATION OF
GRAPHICAL USER INTERFACE TOOL &
SERVICES
FOR
OPERATOR TRAINING SIMULATOR**

DATE OF ISSUE	REV. NO.	PREPARED BY	CHECKED BY	APPROVED BY
30.11.2017	00	SUNITHA L ARIJIT RAHAMAN	PRAVEEN ALEX	N RAMESH KUMAR

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CHAPTER-A

BIDDER QUALIFICATION REQUIREMENT

SECTION – I

SCOPE OF SUPPLY & SERVICES FOR OPERATOR TRAINING SIMULATORS

PURPOSE

Bharat Heavy Electricals Ltd – Electronics Division or BHEL-EDn (hereinafter referred to as the Employer), P.B.No.2606, Mysore Road, Bangalore, having its head office at BHEL House, Siri Fort, New Delhi – 110049, shall be executing replica Operator Training Simulator (OTS) projects for different variants/ratings of sub-critical and super-critical coal fuel fired power plants in India. These training simulators aim to provide a complete system for training of their clients' personnel and other functionalities specified herein in useful and efficient manner.

Graphical User Interface (GUI) package is being procured for developing models, using first principles, for processes in sub-critical and super-critical thermal power plants of various ratings (210MW to 800MW). The tool should have the capability to seamlessly integrate with BHEL-EDn Distributed Control System (DCS) - MaxDNA V6.0.7 and above / ValmetDNA Release 2011 and above.

Bidders' role is to supply GUI Tool to enable BHEL-EDn in designing, engineering, developing mathematical models, programming, system integration, testing, and installation & commissioning of Operator Training Simulator. Bidder to train BHEL and/or their customer engineers for using GUI tool so as to make them self-sufficient in developing, debugging and troubleshooting models independently.

Through this tender, BHEL-EDn seeks to select a bidder qualifying techno-commercially and on the basis of meeting the Pre-Qualification requirement detailed in Chapter-A of this specification and Bidder Technical Compliance Criteria detailed in Chapter-B of this Specification.

1.0 BIDDER COMPETENCE REQUIREMENT:

1.01 The proposed GUI tool should have capability of modeling a replica Coal fired Sub-critical and Super-critical power plants in the range of 210MW to 800MW and develop full scope Operator Training Simulator. GUI Tool shall necessarily have drag and drop features to create a thermodynamic model for both sub-critical and super-critical thermal power plants from in-built component library. Bidder shall include all the licensing rights for BHEL to develop a custom blocks to include in library for repetitive use and also permit BHEL to develop customized components/code for a grouped object for repetitive use.

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- 1.02** Bidder shall necessarily have experienced technical resources available in person at BHEL-EDn to provide technical support on modeling issues, within a week's time.
- 1.03** Bidder shall have an established office in India to extend such technical expertise and services as needed and Bidder to furnish evidence of having a registered establishment in India as part of the technical proposal itself. Bidder to include list of man power available in their Indian establishment along with experience certification on the GUI tool being offered.
- 1.04** This specification is for a set of project as mentioned in **Table-1: Project Set**
- 1.05** For **Projects mentioned in Table-1**, the Bidder should offer a graphical user interface (GUI) based simulation modeling tool and should have designed engineered, supplied, erected & commissioned full scope replica Training Simulator for a Coal fuel fired station having unit size 210 MW or above, in India or abroad. Bidder shall submit a satisfactory completion certificate & un priced Purchase order from their client for having completed the said project and successfully handed over The projects identified in Table-1: Project Set shall be engineered and supplied in a manner as deemed fit by BHEL-EDn. The projects may be executed simultaneously or their execution may be spread out in a staggered manner as per the need of the employer. The projects, wholly or partially, in **Table-1: Project Set** might be subject to rescission by BHEL-EDn. BHEL-EDn shall communicate officially on such exigency. Bidder hereby agrees to claim no financial compensation for those cancelled projects from BHEL-EDn.
- 1.06** The Bidder shall be responsible for sending the qualified personnel, meeting employers' approval for design, installation, testing, commissioning, fine-tuning and other services under his scope of work as per this specification.
- 1.07** The detailed technical specifications for training simulators in general are detailed in Annexure-A of this specification.
- 1.08** In the event of conflict between requirements of any two clauses of this specification, the interpretation given by BHEL-EDn shall stand final.
- 1.09** In the event of non-compliance with any of the clauses of this specification, Bidders offer is liable for rejection.
- 1.10** Qualified Bidder shall have to be approved as vendor by employers' clients. Bidder shall hereby agree that necessary documentation as needed by employer's client shall be provided for obtaining approvals.

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Table.1 - PROJECT SET

Sl. No	Project	License	License for BHEL-EDn's Engineering use	Training to BHEL-EDn Team On GUI Package, Interface Tool, etc. including hands-on training in model building at BHEL-EDn	Modeling and/or Technical Support During FAT at BHEL-EDn		Modeling and/or Technical Support During Model building stage and model Fine-Tuning @
	Title	Set	Set	Man Days	Man Days	Visits	Man Hours
1	PROJECT – A1 (270MW)	01	01 (for 2 users)	28	10	01	100
2	PROJECT – A2 (800MW)	01			10	01	100
3	PROJECT – A3 (800MW)	01			10	01	100
4	PROJECT – A4 (800MW)	01			10	01	100
5	PROJECT – A5 (660MW)	01			10	01	100
6	PROJECT – A6 (660MW)	01			10	01	100
7	PROJECT – A7 (800MW)	01			10	01	100
8	PROJECT – A8 (800MW)	01			10	01	100

Note :

- Each License set should have Runtime, Development and Instructor station features. License-set shall have lifetime (perpetual) validity and upgrades/patches/bug fixes up to 2 years from the date of supply shall be included in the offer.
 - At the time of handing over of project to employer's client, Bidder shall upgrade GUI tool with its latest version.
 - Project Set includes both Subcritical and Supercritical plants ranging from 210MW to 800MW projects
 - Bidders has to quote for all supplies and Services indicated in the above 8 line items for the purpose of evaluation. Man-days indicated for Training (28 days) shall be ordered along with first delivery. However, it is the Bidders responsibility to hand-hold BHEL's experienced engineers, till they independently use the GUI tool for project specific customization of OTS and deliver to BHEL's end customer.
 - One Man Day is 8 hours per day for all week days (Working day of BHEL).
- @ Modeling, Support during Model building and Model Fine Tuning include support during engineering and SAT (Site Acceptance Test) by BHEL.

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1.05.01 PRICE BID SUBMISSION FOR PROJECT SET SHALL BE AS PER THE TABLE BELOW

S/N	Item Description	Required Quantity	Price per unit INR	Total in INR	Remarks	
A. Supply						
1	Development, Runtime, Instructor station and Interface perpetual license	8 Sets				
2	Development, Runtime, Instructor station and Interface perpetual License for BHEL-EDn engineering use (for 2 users) with life time support.	1 Set				
3	GRAND TOTAL (SUPPLY PORTION)					
B. Services						
S/N	Description	Duration	No. of visits	Price per unit INR	Total in INR	Remarks
1	Training on GUI Package, Interface Tool, etc. including hands-on/on-the job training (OJT) in model building at BHEL-EDn (Per day chargesx28 man days)	28 Man Days	1			
2	Technical Support during FAT at BHEL EDn (10 man-days x 8 projects)	80 Man Days	8			
3	Modeling and/or Technical Support during model building and model Fine-tuning (100 man hours x 8 projects)	800 Man Hours	NA			
4	GRAND TOTAL (SERVICES PORTION)					
Note: 1. Refer to RFQ for Commercial terms and Conditions. 2. Any additional man-days utilized by BHEL shall on pro-rata basis for B.2 & B.3 as a separate order. LOWEST BID FOR PROJECT SET = A3 + B4 + APPLICABLE TAXES						

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SCOPE OF SUPPLY, SERVICES AND TRAINING

The Scope of supply for the Bidder shall comprise the following for each project listed in Table-1

2.0 SUPPLY

- 2.01** Supply of GUI tool meeting this specification requirements.
- 2.02** The Bidder supplied software package as part of deliverables shall be computer independent. It should be possible to run it on different hardware (Server grade PCs any make for e.g. DELL/HP/IBM etc.), and different operating systems-Windows2008 Server, Windows2012 Server, WINDOWS 7 among others.
- 2.03** Bidder shall provide GUI software bug fixes / patches / upgrades for 2 years from the date of supply of license set for respective projects. This License shall have perpetual (Lifetime) warranty. Bidder shall establish a mechanism to notify BHEL on new release of patches/upgrades as and when there are releases and include BHEL in their mailing list or any other mechanism for notifying on regular interval.
- 2.04** Each License set shall have Runtime, Development, Instructor station and interface features etc.. all those required for completion of a project.
- 2.05** The Development, Runtime, Instructor station and Interface License shall be supplied in the form of USB dongles / Network license. Supply of License in Dongle or Network version depends on BHEL clients' contract requirement and shall be informed to Bidder at the time of supply on case to case basis.
- 2.06** The License set shall be either network or USB dongle based and shall be portable, independent of PC hardware and OS. Also, Bidder shall ensure that new license/renewal of license will be supplied in the event of any up gradation / change of hardware in work stations supplied by BHEL to meet their contractual obligations.
- 2.07** Bidder shall ensure availability of requisite licenses to seamlessly integrate with emulated environment of BHEL-EDn's DCS (MaxDNA V6.0.7 and above / ValmetDNA Release 2011 and above).
- 2.08** Bidder to supply interface with Application Programming Interface (API) to integrate offered GUI tool with MaxDNA & ValmetDNA virtual controllers as part of deliverables. Expected number of I/Os for a 800MW OTS interface shall be typically in the order of 15,000 Nos.



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- 2.09** The Bidder shall provide, within his quoted price, all required licenses and services which may not be specifically stated herein but are required to meet the intent of ensuring Total Solution including complete development of the OTS and their operability, maintainability & reliability, as covered under this specification.
- 2.10** Bidder to demonstrate performance of model built using offered GUI Tool and communication between sample model and BHEL-EDn DCS during technical evaluation stage itself (within 15days of receipt of technical bids, unless delay is attributable to BHEL). Also, Bidder to demonstrate features of Instructor station features with BHEL's virtual controllers. Bidder is herewith agreeable to provide a demo license for GUI tool for evaluation prior to opening the price bid.
- 2.11** Should there be a requirement to develop any new patches / models / upgrade to library components or any other that may require for completion of simulator projects listed in Table-1 or for seamless integration between GUI toolkit and BHEL-EDn virtual DCS controllers, Bidder shall be action as deemed fit to provide solution to BHEL-EDn on priority within the contractual time-frame and at no extra cost to BHEL-EDn, while meeting the employers requirements.
- 2.12** Documentation shall, as a minimum, comprise the following:
- a. Development documentation which may include user guides mathematical modeling, equations, flow charts, derivations etc. that may be needed for BHEL-EDn/their clients' requirements.
 - b. Software GUI toolkit Documentation – Users guide.
 - c. Operation and Maintenance Manuals including diagnostics
 - d. Documentation / Training material / Presentation required to obtain approvals from employers client namely, System design documents, Product overview / Salient features, new macro development, Instructor station features, creation of Malfunctions etc.

3.0 SERVICES

- 3.01** Bidder to ensure availability of Technical team's support and involvement for project specific model-building, fine-tuning and Factory Acceptance Test (FAT) at BHEL-EDn Bangalore as detailed in Table-1.
- 3.02** Hands-on / On-the-Job Training (OJT) at BHEL-EDn, Bangalore as detailed in Table-1.

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3.03 Should there be a requirement, BHEL-EDn engineer will visit Bidder's works place for developing / fine tuning the model. In such case, the travel expenses will be borne by BHEL-EDn. BHEL-EDn shall give minimum of 48 hours prior information to Bidder for the visit of their engineer.

3.04 All expenses towards Travel and Living in India for the visits of Bidder, till respective project handover to BHEL's clients shall have to be borne by Bidder.

4.0 TRAINING

4.01 The Bidder shall provide structured training at BHEL-EDn, generally in the following areas to BHEL and / or their clients' engineers

- i. Overview of GUI Tool
- ii. Comprehensive training on familiarization and usage of the GUI tool with reference to model building and development of training simulator..
- iii. GUI Tool architecture / hierarchy & creation of new library modules.
- iv. Use of the system including interaction between simulator models and controls.
- v. Connectivity of simulator with BHEL-EDn's virtual MaxDNA and ValmetDNA Controllers
- vi. Translator / convertor software for DCS/Human Machine Interface (HMI), if any
- vii. Trouble shooting and fault analysis
- viii. Instructor Station Features, detailed in the later part of this specification
- ix. Operator evaluation package, detailed in the later part of this specification.
- x. Starting up and shutdown of Simulator software
- xi. Hardcoding of the software as needed to mitigate the complexity in developing process model.

The intent of the structured and on the job training is to ensure that BHEL engineers adequately learns the skill set for using the GUI tool. As such BHEL engineers have used several such technologies in the past and have mastered in using those GUI tools of international repute for OTS design and development upto 800MW variants.

Bidder is expected to handhold BHEL engineers in getting them familiarised on the GUI tool features and equip them to model the fossil plants sub-systems using Bidders' GUI tool detailed in the later part of this specification. Logistics/schedule for conducting such hands-on training shall be discussed during execution stage.



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SECTION – II

S/N	CHECKLIST FOR BIDDER COMPLIANCE REQUIREMENT	YES/NO
1	Bidder should be a simulator supplier and a graphical user interface (GUI) based simulation modeling tool developer for coal fired thermal power plants and should have supplied full scope replica Training Simulator for a coal fired power plant having unit rating of 210 MW or above in India or abroad.	YES/NO
2	Supply of GUI tool in compliance with this technical specification	YES/NO
3	Supply of Interface Tool developed using APIs for interfacing GUI Tool with BHEL virtual MaxDNA and ValmetDNA controllers as detailed in this specification	YES/NO
4	Bidder to demonstrate Interface communication between GUI software package and virtual MaxDNA / ValmetDNA version as detailed in this specification	YES/NO
5	Bidder shall be responsible for supplying new patches / models / upgrades to library components or any other to build 210MW to 800MW OTS as detailed in this specification	YES/NO
6	Technical Support and involvement of Bidder's engineers during model-building, fine-tuning, FAT and SAT as detailed in this specification	YES/NO
7	Each License set shall have Runtime, Development, Instructor station and interface features etc.. License-set shall be lifetime (perpetual) validity.....as detailed in this specification	YES/NO
8	Compliance with Training needs as detailed in this specification	YES/NO
9	Bidder shall have an established office in India to extend technical support and services as detailed in the specification	YES/NO
10	Technical Compliance for each clause detailed in this specification or Nil deviation statement is attached (duly signed with office stamping)	YES/NO

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CHAPTER-B

TECHNICAL REQUIREMENT

SECTION – I

BRIEF SPECIFICATION OF GUI BASED SIMULATION SOFTWARE TOOL

Brief typical specifications of GUI Tool functionalities are given below. A detailed specification is attached in **Annexure-A**. Offered tool shall meet all the project requirements as listed in this section as minimum.

5.01 Dynamic simulation of power plant components and systems:

A library of pre-engineered mathematical models of fossil power plant components should exist. In addition to basic items as pumps, pipes, super heaters, generators, condensers, electrical breakers, motors and other components as required for development of simulator for a sub-critical /super critical thermal power plants. The library should necessarily contain control modules such as actuators and PI controllers. List of components with explanation of library may be attached with technical proposal.

5.02 The software tool should allow the accurate simulation of steady-state and dynamic behavior of all processes in a power plant including Air & Flue Gas System, Water & Steam Cycles, fuel firing system, Condensate & Extraction systems, Turbine oil system, Air compressor systems, Cooling Water systems, etc. All pressure, temperature, level, flow, etc. profiles to be calculated to the component level.

5.03 Plant and component performance evaluation viz. Cold Startup, hot-startup, Safety (protections), malfunctions and various operational analyses etc. shall be part of GUI tool.

MODELING CAPABILITIES

5.04 The user should be able to define the process interactively by selecting the desired components from the library provided by the Bidder using Graphical User Interface (GUI), configure these components as per the reference plant and enter input data. The software tool should be able to generate model for the configured process for delivering an Operator Training / Design Simulator.

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- 5.05** The system shall readily provide modeling components to enable the user to construct a model in part or full, for fossil fuel fired power plants from the library of this component model for steady state and dynamic process. In addition to the above listed components, any additional components which are required to complete these power plant models will also be provided by Bidder, as and when required till project hand-over to end-user.
- 5.06** The system should have provision for the users to develop an object with GUI representing the physical entity of plant such as Valve, Pipe, Motor, etc, in respect of its functionality required for a plant simulation. The GUI will provide all the necessary user interfaces to completely model a component.
- 5.07** The system should allow user to enhance utilization of an existing component available in the library to a new component by specifying additional specific functionality to the component.
- 5.08** The system should allow building a compound component to be developed from a set of individual components, which shall have all the characteristics of individual component.
- 5.09** GUI tool and its components shall have the capability to integrate 3D/2D models (videos) developed by employer.
- 5.10** The system should generate the models from the first principles by using appropriate Mass, Energy, Momentum balance etc. in addition to having a facility to build empirical models. It should also be possible to integrate models which utilize techniques such as neural networks developed under different packages such as Neuro-solutions etc. Bidder to specify the details of the nature of such support in their system while submitting the techno-commercial bids.
- 5.11** The GUI tool shall allow the user to develop the model under different Unit systems (FPS, MKS, SI systems) and system should allow the user to convert from one unit system to the other, without going in and changing units for each component individually.
- 5.12** The minimum possible cycle time of the simulation cycle will be such that the real-time characteristics of the system will be able to be established by the GUI tool Bidder to specify the minimum possible cycle time and corresponding hardware requirements, etc.
- 5.13** The system shall allow the user to modify the geometrical data of a component and will also provide a facility to summarize all the geometrical data of the components involved in one place, such as export / import options, to enable BHEL-EDn to customize the data for any another Similar rating of project without any restrictions.

5.14 The system shall allow the user to specify convergence criteria to the underlying solver which is required to handle gracefully for any instable conditions, etc.

5.15 All components including Electrical system of GUI tool shall be running in one platform i.e GUI tool itself.

SIMULATOR SOFTWARE REQUIREMENTS

6.01 The simulation software shall run under the unmodified operating system. The software should have the ability to:

- Build custom property packages
- Develop specialized unit specific operations
- Create Customized multiple units operation in the same environment.

6.02 The simulation software shall provide the following functionally:

- Software that permits the simulator to be operated in training mode alone.
- Software that permits modifications to the process model, controls, instructor station and field operator displays for engineering applications and software maintenance purposes.
- Software that permits the use of the system for engineering studies.

MODE OF OPERATION AND FUNCTIONAL CAPABILITIES

6.03 The proposed GUI tool for simulator should have the following modes of operations for ease of doing engineering study

- Instantaneous mode of calculation and Steady State
- Real time mode of calculation or Dynamic Simulator

6.04 Instructor station functional capabilities given below are required as a minimum. The detailed requirements shall be as per enclosed **Annexure-A**.

- Model Selection, if multiple models are installed in the same hardware(PC)
- Trainee definition and selection.
- Initial Conditions Selection
- Freeze and Unfreeze Model Operation
- Automatic and Manual Snapshot Training simulator
- Real Time and Historical Trending
- Malfunctions
- Instructor Variables
- Remote Functions
- Time Scaling

- Backtrack
- Scenario
- Automatic Training Exercises
- Trainee Performance Evaluation
- Alarm & Event Monitoring
- Event Driven Help
- On-line Help
- Easy connection of modules
- On-screen input forms (with default values)
- On-screen help
- Automatic parameterization of input

Detailed description is provided in Annexure-A of this document.

OPERATOR EVALUATION

6.05 The system shall have the facility:

- a. To configure different parameters which shall be monitored during any training session for evaluating the performance of operators.
- b. To record and replay the operator actions in all the OWS for purpose of trainee evaluation.

SECTION – II

FUNCTIONAL GUARANTEES

7.00 GUARANTEES FOR SIMULATOR SYSTEM

The parameters/capabilities to be demonstrated for various systems/ equipment shall include but not be limited to the following:

7.01 TOLERANCE

The coal fired power plant simulator shall present to an operator in training, quantitative values of plant parameters within the tolerance specified for these conditions that the simulator is designed to simulate.

7.02 STEADY STATE OPERATION

7.02.01 The simulator computed values for the principal mass and energy balance shall be consistent within +1.0% and shall not detract from training.

- a) Boiler BTU input to generated electrical power
- b) Main steam temp to boiler pressure
- c) Feed water flow to steam flow
- d) Generated MW's to steam flow

7.02.02 The simulator computed values of critical parameters including their display accuracy shall agree with the reference plant parameters by +2.0% between 25% and 100% of power level and shall not detract from training. Examples of the critical parameters are:

- a) Main and throttle steam enthalpy mass flow rate and pressure
- b) Feed water flow and temperature
- c) Fuel flow and fuel heating value
- d) main steam pressure and temperature
- e) Reheat steam enthalpy mass flow rate and pressure
- f) Combustion air flow and temperature
- g) Condensate flow
- h) Heater drain flow
- i) Condensate flow
- j) Generated electric power

7.02.03 The simulator computed values for critical temperatures will be in agreement with the actual plant values as follows :

- 100% load $\pm$ 2%
- 75% load $\pm$ 3%
- 50% load $\pm$ 3%
- 25% load $\pm$ 3%

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7.02.04 The simulator computed values for steady state, full power, automatic, control operation shall not change (drift) by more than + 2% over a 60 minutes period, and shall not detract from training. Bidder shall technically support in achieving these accuracies in the models developed by employer and handhold them in meeting their clients specification.

7.02.05 The calculated value of non-critical parameters like motor currents, valves and dampers position, parameters associated with auxiliary systems pertinent to plant operation shall agree with the reference plant within a tolerance of + 3% between 25% to 100% of power load and will not detract from training.

7.03 TRANSIENT OPERATION

For transients the response of appropriate displays during start up, shutdown and emergency operation shall be within +5% relative to the developed design data base.

Tests shall be conducted to prove the capability of simulator. Acceptance criteria for these tests shall:

7.03.01 Where necessary for effective training be within limits of plant start up test when these tests follow normal operating or emergency procedures.

7.03.02 Not violate the physical laws of nature.

7.03.03 Require that the initial direction of the observable change in the parameters to be same as the reference plant, and when appropriate be controllable over the parameter's range.

7.03.04 In no case during a transient fail to cause an alarm or trip, if the reference plant would have caused an alarm or trip. Conversely the simulator shall not cause an alarm or trip, if the reference plant would not cause an alarm or trip.

7.03.05 The scope of the simulator performance curves shall be similar to the curves predicted for the plant being simulated. The sign of the second derivative of any section of any simulator performance curve and the curve predicted for the plant being simulated shall be the same.

SECTION – III

DEFINITION OF TERMS

1. Back track

Restoration of the simulator to a previous set of conditions which has been automatically recorded at designated time intervals.

2. Condition Override

The instructor may intercept signals from the computer to the control board and either negate the signals or increase or decrease their values in order to introduce false indications of instruments being monitored by the trainee.

3. Critical Parameters

- a. Those parameters that require direct and continuous observation to operate the power plant under manual control.
- b. Input parameters to plant safety systems.

4. Cry Wolf Alarm

The instructor may activate false alarms throughout the training exercise to test the ability of the trainee in interpreting control room indications.

5. Design Data

Data which describes the design basic of the simulator

6. Fine Tuning

The modification of the simulation models, programs and simulator responses based upon actual plant data obtained from the real plant so that the simulator performance when compared to the actual plant performance is within the specified tolerances.

7. Freeze

A condition whereby the dynamic simulation will be interrupted and remain static until the simulator is taken out of the “freeze” mode, at which time dynamic simulation resumes.

8. Initialization condition

The pre-programmed condition prior to the start of the operation of simulator.

9. Malfunction

Failure or degradation in performance of plant equipment.

10. Manufacturer

Manufacturer, as used herein, shall mean the overall simulator supplier after the contract is awarded.

11. Ready for Training – (RFT)

After successful completion of fine tuning and all acceptance tests, the simulator can be declared ready for training.



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12. Real Time

Simulation of dynamic performance in the same time base relationships, sequences, durations, rates and accelerations as the dynamic performance of the reference plant.

13. Recall

After a specific set of plant conditions has been stored in the computer, the instructor may recall that set of conditions at any time for display on the control room instrumentation.

14. Reference Plant

The specific coal fired power plant from which the simulator control room configuration, system control arrangement and simulator data base is derived.

15. Remote Functions

Operator functions required for operation which would normally be performance from outside the unit control room such as the operation of manual valve. These functions shall be operable from the instructor's stations; the instructor will act as a remote auxiliary operator.

16. Replay

The simulator may be stopped, back tracked to a specific point, and a particular evolution replayed for the trainee's study.

17. Simulator Data Base

The "simulator data base" shall be predicted data and plant design data of the reference plant or it may include generic power plant performance data.

18. Snapshot

The instantaneous storage of existing conditions at any selected point time. The stores condition then becomes a temporary initialization point and may be called up repeatedly.

19. Tolerance

The tolerance stated in the specification is based upon the full scale value of the operating range of the parameter.

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SECTION – IV

S/N	CHECKLIST FOR TECHNICAL REQUIREMENT	YES/NO
1	Compliance with Annexure-A Simulator system functionalities as per this specification	YES/NO
2	GUI tool and its components shall have the capability to integrate 3D/2D models (videos) developed by employer.	YES/NO
3	GUI Tool capability of developing model under different unit systems (FPS, MKS, SI) and inter-convertibility between unit systems	YES/NO
4	All components including Electrical Systems shall run in one platform i.e in GUI tool itself	YES/NO
5	Cold-Start to Full Load operation in Steady-state mode without DCS for MAT (Model Acceptance Test) without any limitations.	YES/NO
6	Supply of GUI tool meeting the technical specification detailed in Section-I of Chapter-B with Nil deviation.	YES/NO
7	Supply of GUI tool meeting the technical specification detailed in Section-II of Chapter-B with Nil deviation.	YES/NO
8	Supply of GUI tool meeting the technical specification detailed in Section-III of Chapter-B with Nil deviation.	YES/NO
9	Supply of GUI tool meeting the technical specification detailed in Annexure-A of Chapter-B with Nil deviation.	YES/NO
10	Does GUI tool need Hard coding for modeling of any sub-system	YES/NO

Note:

1. Technical bid is liable to be rejected in the event of Bidder not complying with various sections of the Technical Specification. Decision of BHEL is final and irrevocable.

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ANNEXURE-A

SIMULATOR SYSTEM FUNCTIONALITES SIMULATION MODEL AND FUNCTIONAL REQUIREMENTS

1.0.0 GENERAL

- 1.1.0 The simulators are being built by BHEL based on the design of the respective clients' requirements for 270 MW, 660 MW and 800 MW and the GUI tool shall be capable of meeting the specification given in this Annexure-A for any plant capacity ranging from 210MW to 800MW.
- 1.2.0 The Simulator Design includes equipment, Instrumentation and controls that will enable and operator to function in all modes of the specified fossil (Coal/Oil) fired power plant operation including normal, abnormal or emergency operating conditions. The response of the simulator resulting from operator action, automatic plant controls and inherent operating characteristics shall be realistic within the limits of the performance criteria. The simulator so designed shall calculate plant system parameters corresponding to particular operating conditions, display these parameters on the appropriate displays, and provide proper alarm and/or protective system action.
- 1.2.1 The GUI tool shall be capable of developing and engineering a Simulator capable of continuous, automatic, reliable, and in real time all operations of the real plant as specified. A GUI tool shall be capable to develop a simulator of high fidelity and integrated behavior to provide the realistic simulation of the plant system and equipment and control and instrumentation.
- 1.2.2 The in-built core library of GUI tool shall be sufficient to model each plant system accurately by simulating all functions as detailed in the drawings / documents supplied by the Employer for any sub-critical and Super critical power plants. The combination of all systems shall provide a realistic overall plant simulation. Any details or information of systems and equipment described in this specification is meant only as an initial bidding guide. Generally, modeling for each system and component shall be done for each operable mode, (automatic, manual etc.) where the system/equipment is capable of being operated in more than one mode.
- 1.2.3 The GUI tool shall provide adequate flexibility to add custom coding to develop a new /enhance available features as demanded on employer and GUI tool should allow expansion or modification of the hardware and software to reflect advances in design and technology and to upgrade the simulator systems, equipment and responses to actual plant operating conditions as they become known.
- 1.2.4 The simulator models of the plant dynamics shall represent the responses of the respective base projects in a realistic manner to the operator-trainee on the HMI. The design shall include, where required, special phases of operation of certain plant functions operable from outside the unit control room during normal and abnormal simulated plant operations. These functions shall be operable from the instructor's stations, the instructor acting as a remote auxiliary operator.
- 1.2.5 The information that will be required for the development of mathematical models and data base shall be provided by Employer.

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- 1.2.6 After plant startup, actual plant operating data shall be used by the Employer in retuning of the models and data base as demanded by end customer.
- 1.2.7 Simulator fine tuning shall cover all modifications required to correct the modeling accuracies; changes to accommodate any change in design data and drawings from data freeze date to fine tuning data freeze date due to design modifications, changes made during installations and commissioning and any other reason as well as data based on actual operation of the plant.
- 1.3.0 The Dynamic and Steady-state responses of the developed models shall be such that, plant transients shall have the same time dependence as observed in the reference plant. Transient responses shall reflect plant like trends.
- 1.4.0 The simulator shall be capable of performing in the following manner:
- 1.4.1 The fossil (Coal/Oil) fired plant simulation shall provide the transient responses such as caused by, but not limited to, changes in various pressures, flows, temperature, density, heating value, moisture content, feeder position and coal air mixture proportion changes, coal quality variations, change in positions of all valves, dampers and vanes in all plant systems etc. Ambient temperature variation should be an instructor operation particularly for the cooling water temperature variations for its variation to be felt into the system efficiency.
- 1.4.2 The simulator shall be capable of simulating continuously in real time and selectively in fast time a hot or cold startup to full load condition, load modulation (both manual and automatic) and a shutdown to hot or cold condition.
- 1.4.3 In the absence of operating power plant performance data, the simulation shall be based on predicted plant design data. The simulator shall use parameters corresponding to the particular operating conditions display these parameters, and provide the proper alarm are approached or exceeded.
- 1.4.4 In case the basic plant / equipment data is not available for a few plant areas, then artificial intelligence based modeling shall be required to be used and GUI tool should be capable of meeting such requirement.
- 1.4.5 The effect of any malfunction or a combination of malfunction shall be reflected in all plant parameters just as it would be in the real plant. At the time of occurrence of malfunctions, no parameter shall show unrealistic value.
- 1.4.6 All protections, interlocks, logics and controls of the real plant shall be incorporated in the simulation model.
- 1.4.7 GUI tool shall be capable to incorporate Local Operator actions & Remote functions in the model.
- 1.4.8 The systems and descriptions given below should not be taken as the total simulation requirements but are meant only as a guide for bid purpose to define the minimum scope of simulation that is required. The model requirements mentioned in this specification are only indicative and not exhaustive.

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- 1.5.0 Scalability of certain functions specified herein, e.g. Malfunction, initial conditions etc. is intended to mean the number of such functions to be implemented using the GUI tool and tool shall be capable of addressing such requirements and the GUI tool / system shall be capable of adding more numbers at any stage & configuration should in no way be restricting such scalability.
- 1.6.0 The scope of overall simulation shall be limited to the controls of systems operated from the Central Control Room generally for the equipment and systems located in main plant as well as a few equipment and systems those are not in main plant (Off-site) but controlled from main plant like CW system, Compressor, Condensate Polishing Unit (CPU), Flue Gas Desulphurization, DM Plant, AHP, CHP & PT Plant etc.

The GUI tool shall be capable of developing the replica plant models for the following plant sub-systems without any limitations. These are described hereunder for the purpose of bidding and shall not be limited to these only and these are extracts from Employers' clients' specification as a reference of Bidder.

2.0.0 FUEL AND AIR FEEDING SYSTEMS

- 2.1.0 A realistic simulation of the fuel and air feeding systems shall be provided. The simulation shall encompass the following systems, as required in the specified plant, level control, feeder and pulverizer on-off control, feeder speed control, burner control mechanism, PA fans control, seal air fans control, scanner air fan control, fuel oil control etc. Fan starting current, bearing vibrations and temperatures and associated alarms shall also be simulated.
- 2.2.0 The fuel oil system simulation shall lend itself to fuel oil pressure, primary and secondary air flow rate and pressure. The length of the flame as affected by primary air shall also be simulated. Math models shall include air feeding systems with humidity effects, damper position, (pressure drop effects due to friction) operating point on the fan performance curve, acceleration, expansion, the air heater with proper partitioning of primary air, secondary air, gas and metal regions. Fan horsepower shall be determined from flow and pressure and shall be related to motor current. Fuel inlet flow and temperature shall vary with the air heater and flow control adjustments. Coal system simulation shall include feeder speed, feeder and coal inertia effects, variable coal quality, variable coal-air mixture, coal-air mixture temperature at different stages, and pulverizer dynamics. Fluid transport delay shall affect the excess air/oxygen indication.
- 2.3.0 Realistic pressure, flow and temperature simulation shall be provided to derive appropriate parameters readings for the air and fuel circuit.
- 2.4.0 The plant interlock and protection system shall automatically initiate protective action, such as shutting down the plant, closing isolating valves/dampers, or starting standby auxiliary systems, whenever the plant conditions monitored by the system reach prescribed limits.
- 2.5.0 The burner ignition system shall be simulated as a function of control switch logic preprogrammed ignition time delays and complete burner logic systems and furnace dynamics.

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3.0.0 **STEAM GENERATOR**

3.1.0 The steam generator shall be simulated by modeling zone wise heat transfer throughout the combustion zone, gas flow path, thermodynamic properties in the water wall tubes, separator including start up control system, Super heater, Reheater and economizer.

3.2.0 The steam generator dynamic model shall consist primarily of conservation equations, approach to property handling, semi-empirical heat transfer for different regimes, fluid flow correlations for single phase and two phase and appropriate equations of state applied to each region.

3.3.0 Furnace region, each of the fuel and air feed streams, oil spray, water vapor entry through various mechanisms, non-ideal combustion as a function of oxygen concentration, combustion chemistry and kinetics, wind box to furnace differential pressure and furnace draft, radiation and convection heat transfer to the furnace tubes and then to the working fluid shall be simulated. The heat transfer coefficients shall vary with flow. Appropriate heat losses, slagging and scaling effects on heat transfer and draft losses shall be simulated & correlated with metal temperature etc.

3.4.0 Heat transfer coefficients shall be reflected in the simulation of excess air and tilt of the burners.

3.5.0 Other steam generator regions to be simulated are as follows:

- a. Platen super-heater and adjacent furnace roof tubing.
- b. Re-heater, adjacent furnace room tubing and water cooled enclosure tubing.
- c. Final super-heater, adjacent furnace roof tubing and water cooled enclosure tubing.
- d. Second pass steam cooled enclosure, low temperature super-heater terminal tubing.
- e. Low temperature super-heater and steam cooled enclosure tubing.
- f. Economizer and steam cooled enclosure tubing.

3.6.0 In the Boiler, the gas temperature transport time and draft loss shall be simulated together with heat transfer to the working fluid via metal tubing. Convection heat transfer coefficients shall exhibit the appropriate flow dependence on both sides of the tubing. Radiant heat transfer, effective emissivity, slagging effects and geometric factors consistent with empirical boiler operating data shall be simulated. Provision shall be made for degrading the heat transfer surfaces due to soot accumulation.

3.7.0 The soot accumulation factor shall be capable of being reduced by activation of the soot blower, restoring heat transfer effectiveness. Working fluid simulation in each region of the boiler shall include transport time, temperature and pressure drop, consistent with flow rates and water/steam properties for the entire range of operating conditions to be encountered. Response characteristics of the steam generator instrumentation shall be simulated; these include natural needle movements, thermocouple time constants response times and similar effects.

3.8.0 **EXCESS AIR ANALYSIS AND FLUE GAS DISCHARGE**

Flue gas leaving the steam generator enters a plenum at the economizer gas outlet. These multiple ducts shall be simulated to reflect the effects of the air heater, damper, electrostatic fly ash precipitator and discharge through the stack. The simulation shall include



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plenum mixing and transport delay, ducting transport delay, gas pressure drop vs flow characteristics of the ducting and associated components (including dependence upon damper position), ID fan head-capacity characteristics, and fan motor current (including transient starting current) and steady state current consistent with the operating point on the fan operational characteristics curve and associated controls of the flue gas analyser, excess air indication shall vary realistically in accordance with the concentration of O₂, CO, CO₂ etc. in the sample flue gas, subject to analyser limitations. Effect of deposition of ash inside the ducts shall be included in the simulation.

3.9.0 Flame scanners acoustic pyrometers, and burner management system (BMS) and other special instrumentation shall be included in the simulation.

4.0.0 STEAM SUPPLY AND TURBINE

4.1.0 The steam supply system includes superheated steam lines, reheat steam lines to and from the turbine and condenser, the turbine extraction stages, HP-LP bypass lines, seal steam supply and heating auxiliary steam system including De-aerator. The entire steam supply system shall be modeled by computing pressure, flows and temperatures from mass, momentum and energy balance equations. Relief valves in the main steam lines shall be simulated based on steam pressure and shall have staggered relief points.

4.2.0 Steam from the final super-heater will accumulate in the piping inventory and pass on through the turbines and Re-heater to the condenser and be used to warm up the piping and the turbines, provide heating, supply the steam coil air heaters, go to steam seals and be bypassed around the turbine to the condenser. The piping metal temperature and steam metal differential temperature shall be simulated.

4.3.0 The turbine bypass systems shall be simulated for hot and cold startup and response to load changes and throw off. The steam dump valve shall be modeled.

4.4.0 The auxiliary steam supply system shall be modeled. The steam coil air heater and steam atomizer pressure will vary from auxiliary steam header up to low loads and at higher loads from the extraction lines. Auxiliary steam header is provided with pressure and temperature control.

4.5.0 Turbine simulation shall properly represent turbine startup, operation and coast down. High, low and intermediate pressure turbine must be modeled by techniques that give an accurate agreement with the turbine Contractor's thermal design data.

4.6.0 Extraction points for feed water heaters must be modeled. Mass storage in the heaters is to be modeled.

4.7.0 The model for the turbine and auxiliaries shall also include the following but not be limited to:

4.7.1. Turbine Kinematics, including torque resulting from steam flow, inertia, generator load and mechanical and electrical losses.

4.7.2. Turbine mechanics including the applicable vibrations and eccentricities. The turbine clearance and vibration model should provide for turbine rotor "bowing" effects with time and temperature dependence including results of "roll-out" on turning gear.

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- 4.7.3. Turbine thermodynamics, including temperatures, expansions, and differential expansions of turbine shaft and casing hardware shall be provided and related to TSI measurement. Valve metal temperatures where necessary shall be simulated.
- 4.7.4. Auxiliary systems such as the hydraulic oil system and the turning gear system, lube oil system gland sealing system, etc. shall be simulated. The gland seal system simulation must allow representation of malfunctions causing deficient gland sealing with resulting air-in leakage.
- 4.7.5. Simulation of the turbine Electro-hydraulic control including those functions necessary for start up, steady-state, and shutdown operation of the turbine. The simulation of governing system shall include L.P. bypass system and throttle valves also. The electro-hydraulic controls, mechanical hydraulic controls shall interface where necessary with other plant systems. The turbine wall stress analyser and automatic run-up system including automatic synchronizing and block loading up to 10% shall be simulated. GUI tool shall have the inbuilt capability to create a replica of hardwired desk/console having analog/digital indicator for various parameters like pressure, level, temperature- RTD, Thermocouples, voltage, current, MVAR, PF & MW and shall have capability to develop a shynchroscope in Instructor station.
- 4.7.6. All the turbine steam admission valves shall be simulated reflecting both controller demands and protective logic demands.
- 4.7.7. Automatic testing of turbine protection system, stop valves and non-return valves and other testing (excluding maintenance) normally done by the operator from the unit control room shall also be simulated.
- 4.7.8. The variation in the time and in the operational procedures required as a function of the inlet steam parameters.

4.8. CONDENSER

- 4.8.1 Simulation of condenser shall accommodate all modes of normal, start-up and shut down operation. Condenser Hotwell simulation shall include the proper mass and enthalpy balances. Condenser vacuum shall be simulated as a function of work done by vacuum pumps, air leakage into the condenser and the vacuum breaking valves. Load throw off conditions shall be simulated realistically.
- 4.8.2 Condenser water mass conservation shall include inputs from low pressure turbine, drains from HP and LP heaters, unit flash tank, makeup water flow and condensate pump bypass flow. The Hotwell level control system shall be simulated.
- 4.8.3 On-load tube cleaning system also in required to be simulated in way similar to soot blowing.

4.9. CONDENSATE AND FEED WATER SYSTEM

- 4.9.1 The condensate extraction pumps shall be simulated by the appropriate change in the condensate flow as a function of head capacity data and flow resistance and control valve position. Boiler feed pump recirculation to the Deaerator shall be modeled. Pump motor responses to starting operating and shutdown of pumps shall be simulated. The boiler feed pumps and associated shaft- driven booster pumps shall be modeled as turbine driven Control Valve controlled as well as motor-driven with variable speed hydraulic coupling.

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For TDBFP, the turbine shall also be simulated in a similar way to main turbine as applicable for MDBFP. The speed shall vary as a function of feed water flow reflected by the differential pressure across the main feed regulating station. Pump inertia and speedchanger characteristics shall be included in the simulation. The shaft-driven lube oil pump shall be included in the simulation. The dynamics of the turbine of boiler feed pumps shall also be simulated.

- 4.9.2 Control valve operations and its characteristics shall be properly simulated. The Contractor shall furnish the proposed method of simulating the control valves during the engineering stage. Any simplification and linearization in simulated valve characteristics will be subject to review of Employer prior to approval.
- 4.9.3 The mathematical models for condensate and feed water flow, Deaerator, the low pressure and high pressure heaters shall be provided. Zone-wise heat exchange model shall be provided. The heater drain valves actions shall be simulated. For each HP heater, the effect of heater level on the drain cooler and heater shell pressure shall be simulated. Effect of outage of one or more heaters over the efficiency of the plant shall be simulated.
- 4.9.4 Each heater shall be simulated as a mixing of steam either from the turbine extractions with condensate from low pressure heaters. The Deaerator model shall include Deaerator overflow and dump from the condensate line.
- 4.9.5 The flow to the condenser of the uncondensed steam plus absorbed gases, the Deaerator level, temperature and pressure shall be simulated including their controls. The pressure drop in the feed water and condensate chain of piping filter and heaters shall be simulated as a function of flow, flow resistance and stop valve apertures.
- 4.9.6 The feed water temperatures and pressures, steam generation rate, heat input, boiler water blow down conditions shall be simulated. Temperature of the feed water to economizer will affect the energy of the superheat at temperatures and reheat emergency at temperatures and hence superheat and reheat steam temperature regulation.

5.0. WATER CHEMISTRY & SWAS

- 5.1. By use of impurity masses, conductivity indications shall be dynamically simulated at the condenser Hotwell, economizer inlet, condensate pumps discharge, boiler water and main steam. The external water supplies to each simulated impurity system shall be simulated as having fixed impurity content. The impurity concentration by distillation and chemical feed shall be simulated for the boiler water and steam conductivity indication and silica indication. The change in impurity indication concentration caused by boiler blow down shall be simulated and shall reflect on the boiler water and steam conductivity indication and silica indication.

6.0. PLANT COOLING WATER

- 6.1. Simulation shall be provided for the main as well as equipment/auxiliary cooling water system which rejects heat to the cooling water cooler from such equipment as the main condensers, generator hydrogen coolers, stator water cooling, turbine oil coolers, oil coolers, fan bearings, pumps bearings and direct water cooling of miscellaneous plant equipment. Heat transfer to these coolers may be modified by the instructor to reflect fouling of the water side. Ambient temperature variation shall be an instructor operation for the cooling water temperature variation for its variation to be felt into system efficiency.

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7.0. ELECTRICAL SYSTEM

- 7.1. The electrical system math model shall simulate the main generator, static exciter and voltage regulator, in-plant and effect of external load flow on generator performance and load transients.
- 7.2. Generator hydrogen cooling system and stator water cooling system shall be simulated and shall accommodate all controls indications, and alarms in the unit control room. Hydrogen purity can be assumed to be predetermined, but may be deteriorated by the instructor causing trainee to take corrective measures from control room. The generator seal oil system shall be simulated for all controls and indications in the unit control room. Manual and automatic voltage regulation shall be simulated.
- 7.3. The electrical system model shall simulate in-plant emergency use during malfunctions and shall therefore, reflect conditions imposed by the listed malfunctions.
- 7.4. Simulation shall be provided for the station buses including the ability for the instructor to add and reject loads arbitrarily, the ability to separate the unit from the rest of the system, and the loss of unit supply. Individual simulation shall be provided for each of the major pump motor loads and other major station loads.
- 7.5. Simulation shall be provided for frequency synchronization computation, control and display. Synchronization function also needs to be simulated in the software with real time response.
- 7.6. For cases of loss of unit power, auxiliary emergency backup power and to switching the station buses shall be simulated. Load distribution simulation is required for at least the following components:
- 7.7. Generator, main buses with connecting breakers, unit buses, station buses. Bus breaker manual and automatic operation shall conform to those for the operational plant. At the instructor's option, the plant shall follow a programmed electrical load demand cycle.
- 7.8. The main generator must provide suitable dynamic response for the complete range of operations to be simulated. The model must accommodate start-up, load change, and trip conditions, including synchronous operation, and when disconnected, non-synchronous operation.
- 7.9. Effect of changes in the grid to which the generator is connected must be simulated to including free governing mode of operation (FGMO) to the extent that effect of reasonable changes in grid voltage (10%) and grid frequency (47.5 to 52.5) must be represented With good fidelity. Both Megawatt and Megavar loading must be simulated. The simulator must include functional simulation of the exciter and voltage regulator. Grid frequency can be predetermined, but shall be subject to change by the instructor to represent malfunction conditions.
- 7.10. For large components, the simulation of load switching shall include the effects of fluctuations in power, voltage and frequency display.

8.0.0 STEAM AND COMPRESSED WATER FUNCTIONS

8.1.0 Generation of the steam table functions, compressed water table functions and other function curves used at all points in the steam plant simulation shall be based on techniques that provide sufficient accuracy over the entire simulator operating range so that apparent degradation of simulator performance will not result. Generated functions shall be sufficiently free of break points, slope changes, and other discontinuities so that no spurious responses will result in simulator transients. In particular, no resulting break points or slope changes shall be apparent in trend & related displays.

9.0.0 PLANT CONTROL AND INSTRUMENTATION SYSTEM

Plant control system covering the scope of simulation will be emulated by BHEL-EDn.

10.0.0 INSTRUCTOR FUNCTIONS

GENERAL

The instructor shall be able to interfere with the model in various ways outlined below (these are just a few and for bidders reference). For doing this, different modes like menu mode, mimic mode, expert mode etc. shall be present.

10.1. MALFUNCTIONS

10.1.1 The simulator shall be capable of simulating the malfunctions with provision to accommodate **at least 500 malfunctions**. The malfunctions and their method of initiation shall be determined by the Simulator Manufacturer in consultation with Employer.

10.1.2 All of the malfunctions shall simulate conditions as they would occur in the plant. Also the system must simulate conditions that might be introduced by operator errors during a malfunction. Plant response to the malfunction shall be carried out a reasonable and stable operating condition as determined by Employer, by analysis of the training value of each malfunction. Models of malfunctions must include responses for no corrective action, improper action, and operator recovery cases.

10.1.3 An adjustable time delay shall be included in the malfunction software to permit the Instructor to insert separate initiation times for selected malfunctions. Any number of malfunctions shall be capable of being initiated simultaneously or within a delay time selected by the instructor. This time delay shall be variable **up to 2 hours**.

10.1.4 The discernable transient response of certain malfunctions shall be simulated and accurately displayed on HMI. For example, if the inserted malfunction should cause a gradual increase in a pressure, then the concurrent changes in other parameters must be simulated through the level of advance alarm setting and up to the trip setting. If the operator does not take suitable corrective action upon noting the conditions or upon receiving the advance alarm the trip setting will be reached, and appropriate trip events, including unit trip shall be initiated. All malfunctions shall be simulated to persist until corrected by the operator or terminated by the instructor. It will be possible to select a degree of degradation in the system (0-100 percent with increments of 1%) for applicable malfunctions.

10.1.5 Some pre-selected malfunctions are non-recoverable, that is, those malfunctions where the operator trainee is not expected to bring the plant back to normal operation, for example, a furnace explosion.

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10.1.6 The instructor shall be able to accomplish the following **malfunction** operations.

- 1) Time delay malfunctions by setting a problem time for malfunction activation.
- 2) Initiate up to 20 malfunctions at the same time.
- 3) Make a variable malfunction become progressively larger without clearing the malfunction.
- 4) Determine which malfunctions are active.
- 5) Select which component of redundant components is to fail when identified in the malfunction list.
- 6) Select in which manner (high, low or fail) an instrument is to behave when identified in Malfunctions list.
- 7) If a malfunction summery tableau is utilized, a brief malfunction description shall be displayed for each selected malfunction.
- 8) Clearing the malfunction.
- 9) Initiation of malfunctions with variable severity shall be varied by numerical quantity rather than percentage, e.g. loss of pump capacity or pump loads shall be given in absolute value rather than a percentage of rated flow.
- 10) Others as finalized during detailed engineering.

10.2 INITIALIZATION

10.2.1 The instructor shall have the capability of initializing the simulator to **any one of the fifty (50) initial operation conditions**. Selection of initialization conditions shall be done by the instructor. Actuation shall cause the necessary plant parameters to change to correspond with the desired initialization conditions. No changes in programming/ software and making new settings shall be necessary to accomplish these changes. Initialization shall automatically remove all conditions and malfunctions present in the previous simulator operation. The instructor shall be able to initialize to any of 50 initialization conditions, 20 pre-selected conditions and 30 snapshot conditions. The pre-selected conditions shall be chosen by the Employer during detailed engineering. After any initialization condition is selected the system shall perform a switch check function to ensure that all parameters are at the expected value and only then it will run either automatically or after instructor's intervention. Facility to override switch check shall be provided as an instructor function.

10.2.2 The simulator shall be capable of having initialization conditions added or deleted at anytime in the future. However, the pre-selected initial conditions shall be password protected. A partial list of some typical initialization points is as follows:

- i. Cold start-All equipment is stopped and all process temperatures are at 210C. All piping, heaters, hot wells, Deaerator storage tank and condensate tank an auxiliary boiler filled or at normal levels. The boiler is drained. Fuel oil is available. Electrical start-up system shall be de-energised.



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- ii. Same as (i) above, except with the electrical startup system energized.
- iii. Partial cold start-Auxiliary boiler on, supplying steam seals, vacuum is established, the boiler is fired and all necessary auxiliaries are operating. Process conditions will be the same as for a cold start except those affected by this level of operation.
- iv. Bypass- The unit is operating with the turbine bypass valve almost fully open and essentially no steam to the turbine. All process conditions are reflected by this level of operation
- v. Hot start- same as mode 1, except that all process temperatures are at their value for 75 percent load. Air compressors service water pumps, and turbine oil pumps are running as required.
- vi. Hot restart after unit trip – The boiler is operating at effectively normal pressure and temperature and the turbine bypass valve is open.
- vii. Cold turbine – Generator Rolling – The unit is just on turning gear and ready for acceleration. Process conditions will be appropriate for this level of operation.
- viii. Hot Turbine – Generator Rolling – The unit is effectively in same condition as in 7 above except turbine metal and associated equipment is at a higher temperature.
- ix. Half load – Unit is at normal conditions for 50% load.
- x. Full Load – Unit is at normal conditions for 100% load.
- xi. Cold start – Ignition preparation state.
- xii. Cold start – Condenser vacuum up preparation state.
- xiii. Cold start – Turbine start up preparation state
- xiv. Cold start – Synchronizing preparation state.
- xv. Replay – initiate a replay to any prior simulator dynamic conditions recorded for up to 2 hours (just prior to freeze initialization). Replay of a prior dynamics state should be similar in operation to initializing the simulator in all respects.

10.3. BACK TRACK AND REPLAY/RECORD

10.3.1 BACKTRACK

The simulator shall have back-track backward and back track forward capability. The simulator backtrack capability shall meet the following minimum requirements:-

- i. The backtrack program shall continuously record the initialization data pool in one minute interval on the disk in a **wrap round manner for a period of 60 minutes**. Thus at any time, 60 minute data set shall be available covering preceding 60 minutes.
- ii. The desired backtrack record shall be directly obtainable by the instructor either selecting the problem time of the record or by having the program automatically step backwards in time either manually or automatically as selected.

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- iii. The instructor may initialize the simulator at a specific backtrack time. However, if the backtrack time is not specified, then it will default to one minute.

10.3.2 **REPLAY/RECORD**

- i. The record program shall initially store the current status of all parameters at the same rate at which the simulation module of highest interaction rate is running.
- ii. The reply/record system shall be able to record eight hours of simulator operation.
- iii. The instructor shall have the ability to replay any recorded tape to review the exercise and while this tape is being played all the parameters are available in the HMI.

10.4.0 **REMOTE FUNCTIONS**

- i. Functions (such as operation of manual valves etc.) that is not envisaged to be controlled from the control room (CR) and functions (such as tank levels, temperatures, differential pressures, etc.) which will be varied to change the operational conditions and procedures are required for simulation fidelity and diversity of operation and shall be designated as remote functions. The instructor's control of these functions should require minimum operations to change a particular function. Certain continuous type functions (such as manual valve positions, throttle valve positions, tank levels, temperatures, differential pressures, etc.) shall be simulated so as to provide the instructor with variable quantities through a specified range. This will, for instance, allow the instructor to vary the rate of increase/decrease of parameter (oil, water etc.) in a tank by throttling the flow of a parameter through a pipe, utilize automatic pump/value control logic by varying input parameters, etc.
- ii. Even through the method of simulation may take need multiple settings to control one functions, it will be counted as one remote function only.

10.5. **TIME SCALING**

- i. The simulator shall be capable of operating in three modes namely, fast time, real time and slow time in 10 times i.e 10X. Bidder shall hand-hold BHEL-EDn in achieving this requirement.
- ii. Fast time (also called Real-Time Compression) shall provide the capability to accelerate the dynamic simulation in order to observe slow transients or shorten certain time consuming activities, such as obtaining adequate turbine heat up, boiler heat up, raising of condenser vacuum etc. which are characterized by long time constant.
- iii. Real time simulation shall be the normal simulation mode of operation and shall apply to all systems. All system dynamic models shall have sufficient iteration rate to ensure specified tolerance / fidelity and the real plant response.
- iv. Slow time (also called Real Time simulator expansion) that gives an apparent increase in the time interval shall be provided to slow down dynamic simulation in order to observe fast transients and trip situation, loss of component, accidents etc. that is characterized by short time-constant.

10.6. **CRY WOLF ALARM**

The instructor shall have the capability to initiate cry wolf alarms. These alarms will appear to the trainee as real events although no effects on dynamic simulation models will occur. These alarms will be clearly distinguished from malfunctions and will not be included as any part of the number of spare malfunctions required.

10.7. **INSTRUCTOR INTERVENTION**

The instructor shall have the capability of overriding any parameter without affecting the corresponding mathematical model computer process variable value. This override shall continue until reset by the instructor or by an exercise program. Override capability shall be provided on all inputs/output alarms and not on just a few, because in real life any instrument or alarm can fail leading to a false alarm.

10.8. **TRAINEE PERFORMANCE PROGRAM**

- i. Trainee performance shall be continuously monitored during a training drill. All operators' action shall be retained in memory with the name of the device manipulated, and the time of the actions. At the termination of the drill, the trainee performance program shall generate a summary of relevant data, including trainee's (or trainees') and instructor's names, date, nature of the training drill, name of variable, critical parameters, high and low deviations from reference values, total amount of units generated during exercise, etc.
- ii. The termination of the drill may be accomplished by the instructor at any time or it may be terminated by a preprogrammed time interval selectable by the instructor.

10.9. **TRAINEE EXERCISE PROGRAM**

10.9.1 A computerized exercise program shall be provided that will automatically step the trainee through a series of simulator drills and exercises plus a number of operational problems. This program shall be developed so as to eliminate/minimize manual control manipulations by the instructor. There shall be minimum of 20 exercises in trainee exercise program.

10.10. **SIMULATOR EXERCISE GUIDE**

10.10.1 The Contractor shall provide a suggested guide that will contain a series of simulator drills and exercises (minimum 50) arranged in logical sequence and according to difficulty of the task to be learned, subject to acceptance by Employer. The guide shall also contain a number of operational problems that the trainee will be required to solve at the simulator. The guide shall assist the instructor by outlining training objectives and specifying the practice sessions required to accomplish performance goals.

10.10.2 **OTHER REQUIRED FUNCTIONS**

10.10.2.1 The instructor shall be able to monitor the following functions:-

- a. Manipulate external parameters, which are not modeled, but which affect the Simulated plant. These include external load, frequency and /voltage, power factor, and inlet temperature of cooling water etc.

- b. Monitor the actual value of up to 200 specified intermediate calculated variables in the plant models with proper physical units for example, enthalpy, entropy, mass, volume etc.

10.11.1 **FREEZE / RUN**

It will be possible to freeze the dynamic simulations by the instructor. All the parameters & functionalities shall hold the current value / states till the intervention of the instructor. This can be stored to be used for a future initializing point. It will be possible to continue the programs at that point itself and run the system.

10.12.1 **SNAPSHOT**

A selectable snapshot capability shall be provided to allow the instructor to store the particular conditions that exist at any instant during a training session, for future recall, as an additional initialization condition. This feature shall supplement the backtrack feature by allowing the instructor to recreate a particular training condition either within or beyond the periods covered by the backtrack mode. The snapshot feature shall have no effect on other initialization conditions discussed previously.

It shall be possible to store the full set of parameters at any instant during simulation by taking a snapshot without freeze. These snapshots also can be used as initialization points in future.

10.13.1 **ALARM FAULT ANALYSIS**

Features viz. Root cause analysis, alarm filtering, alarm cutout and display of alarms features shall be available in the GUI tool.

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INSTRUCTIONS TO BIDDERS / SELLER

A. Scope & Applicability :-

These Instructions along with all the details, terms & conditions in the RFQ and General Conditions of Contract (Document No: BHEL: EDN: SHOP: GCC: Rev00) shall apply for this REQUEST FOR QUOTATION (RFQ) and any resulting Order(s) / Agreement(s).

B. Definitions :-

Throughout the documents referred to in A above the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- **The Purchaser** means Bharat Heavy Electricals Limited (a Central Public Sector Enterprise) incorporated under the Companies Act, 1956 having its registered office at BHEL House, Siri Fort, New Delhi-110049, India acting through its Electronics Division / Electronics Systems Division at Bangalore and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- **The Bidder** means the person, firm, company or organization to whom the RFQ is addressed / submits an offer against such RFQ and shall be deemed to include its successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor, Supplier or Vendor.

C. General :-

1. All correspondence / clarifications shall be addressed to the contact person given in the RFQ / Purchase Order / Agreement.
2. In case of non-participation in the tender, regret letter with reason shall be sent by the vendor to the purchaser. If a vendor fails to respond against three consecutive tenders for the same item, he will be liable for removal as a registered vendor of BHEL for the item.
3. All timings are Indian Standard Time (IST).
4. Bidders shall not engage the services of the firms banned by BHEL. List of such banned firms is available at website www.bhel.com.

Offers of the bidders who are on the banned list/who engage the services of banned firms shall be rejected.

5. 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.
6. Any consultant or consultant firm including any of its affiliates or associates shall not be eligible to participate in tender / s for the related goods or works or services for the same project, for which they were engaged for the consultancy services by BHEL.

7. Agents / Representatives of OEMs / Principals :-

- a. BHEL prefers to deal directly with Original Equipment Manufacturers (OEMs) / Principal for all its purchases. However, if the OEM / Principal insist on engaging the services of an Agent/Representative, such Agent / Representative will be allowed to represent only one OEM / Principal in the same tender. Either the Agent / Representative could bid on behalf of the OEM / Principal or the OEM / Principal could bid directly but not both. Incase bids are received from both the OEM / Principal and the Agent/ Representative, the bid received from the Agent/Representative will be ignored.
- b. Agent/Representative authorized by the OEM/Principal in turn cannot further sub authorize any other firm for submitting the offer or for placement of order.
- c. Valid Authorization letter from the OEM / Principal to quote and negotiate on behalf of OEM / Principal to be submitted by the respective Agent/Representative.

8. The Purchaser Reserves the Right to :-

- a. Cancel / retender the RFQ at any time before placement of Purchase Order / Agreement, without assigning any reason.
- b. Change the quantity to be ordered and the delivery schedule before placement of PO with mutual agreement with the seller.
- c. Adopt any method(s) of bidding including Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation

in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com). The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. **The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.**

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for



suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).”

- d. Split the quantity in the RFQ among bidders for ordering.
- e. Accept / not accept whole / part of any offer(s).
- f. Accept / Reject any of the counter terms / deviations offered by bidder.
- g. Seek information / clarifications / confirmations relevant to the RFQ from the bidder(s) and fix deadlines for furnishing of the same by the bidder(s) and not to consider the offer(s) of such bidder(s) for further processing who fail to provide such information / clarifications / confirmations within the deadline fixed.
- h. Negotiate with the L1 bidder.
- i. Take necessary action as per prevalent BHEL Policy, with regard to the bidder(s) / vendor(s) who is/are
 - :- (i) Non-responsive.
 - (ii) Found to have been involved in unfair practices / actions contrary to business ethics /actions restricting competition.
 - (iii) Withdrawing offers after opening of Part I bid / s.

D. Guidelines for Making the Offer :-

1. Separate offer in English language addressed to the Purchase Executive shall be made for each RFQ in Single part/two parts/three parts as indicated in the RFQ.
2. a) **Single Part Bid:** Complete offer i.e., techno commercial bid and price bid to be made in single part. Offer shall be placed in a sealed envelope superscribed with RFQ No & Due Date.
 b) **Two Part Bid :** Offer shall be made in two parts as detailed below:
 “Techno-commercial Bid (Part I Bid) placed in a sealed envelope super scribed with RFQ No , Due date & “Techno Commercial Bid (Part I Bid)” & “Price Bid (Part II Bid)” placed in a separate sealed envelope superscribed with RFQ No, Due Date & “Price Bid (Part II Bid)”. Both the sealed envelopes shall be placed in another sealed envelope superscribed with RFQ No & Due date
 c) **Three Part Bid:** Offer shall be made in three parts as detailed below:
 “Pre-Qualification Bid (Part I Bid)” in a sealed cover superscribed with RFQ No, Due Date and “Pre-Qualification Bid (Part I Bid)”, “Techno-commercial Bid (Part II Bid)” placed in a separate sealed envelope super scribed with RFQ No , Due date & “Techno commercial Bid (Part II Bid)” & “Price Bid (Part III Bid)” in another separate sealed envelope superscribed with RFQ No, Due date and “Price Bid (Part III Bid)”. All the three sealed envelopes shall be placed in another sealed envelope superscribed with RFQ No & Due date.
3. Offers for RFQs on EPS (E-Procurement System) shall be made only on the template on EPS portal. All documents as required shall be uploaded on the portal.
4. Offer shall be in accordance with and complete in all respects with regard to the requirements of the RFQ.
5. Offers of Vendors who already have a valid Technical/Commercial MOU with BHEL-EDN for the items of the RFQ shall mention the relevant MOU reference No and give only such other details not covered in the MOU.
6. Corrections / overwriting shall be avoided. Corrections if any shall be respectively incorporated in all the bids (part-I / II / III i.e, Prequalification Bid / Techno-commercial Bid/ Price Bid) as applicable and shall be duly authenticated at each instance of correction by the authorized signatory with name and designation.
7. Offer shall have a minimum validity period of 90 days from the due date of the RFQ.
8. Please refer Clauses E and F below for Standard Commercial Terms and commercial deviations and loading of offers.
9. Bidders to be considered as Micro and Small Enterprises (MSEs) are required to submit the documents as per **Annexure I**.
10. **Non acceptance/deviations if any to the terms and conditions of the RFQ shall be clearly and explicitly mentioned in the offer, otherwise it will be treated that all the terms and conditions of the RFQ are accepted by the bidder in total.**
11. **Pre-Qualification Bid:** Shall have all details required as per RFQ along with documents as applicable.
12. **Techno Commercial Bid:**
 - a. Shall include BHEL material code and description as per RFQ and details of the item offered including make/model/part no along with relevant documents like drawings/data sheets/catalogs/BOMs etc. as applicable.
 - b. Commercial terms such as delivery period, delivery terms, payment terms, taxes and duties as applicable. Delivery quoted shall be earliest firm in terms of no of days/weeks/months from the date of PO/Drawing Approval/Manufacturing clearance as applicable. It is recommended to avoid delivery terms such as ‘ex-stock’, ‘subject to prior sale’ or ‘delivery at the earliest’, ‘subject to release of PO within ----- period’ and ‘delivery range eg X-Y weeks’. **(Please Refer Clause 15 of General Conditions of Contract (Document No: BHEL: EDN: SHOP: GCC: Rev00) is applicable for delayed deliveries)**
 - c. Bidders should mention GSTN number of the place of supply and HSN (Harmonized System of Nomenclature)/SAC(Services Accounting Code) number in the offer. In case both supply and service are involved, GSTN no of the place of supply for services shall also be mentioned separately in the offer if it's different.

13. Price Bid:

- Most competitive price(s) to be quoted.
- Shall include Price details such as currency ,item unit price, total price, discounts if any, packing forwarding charges ,freight, insurance , taxes(SGST/IGST/CGST/UTGST) as applicable.
- Quoted price(s) shall be FIRM and valid till the complete execution of Purchase Order / Agreement, except where price variation is specifically included in RFQ terms in which case the price(s) quoted shall be in accordance with the price variation formula given in the RFQ.**
- Prices in both figures and words to be indicated.
- The price quoted against each item shall be for units stated in the RFQ. Where quotation is in terms of a unit other than that in the RFQ, relationship between the two units shall be clearly brought out.

E. Purchaser's Standard Commercial Terms :-

1. Unless specified otherwise in the RFQ , following are the Purchaser's standard commercial terms:-

Sl No	Description	For Purchase within India	For Foreign Purchase(Direct Imports)
i	Delivery Terms	Door Delivery to BHEL Stores, Bangalore with Freight and Insurance paid.	FCA International Gateway Airport (For shipment by air, Refer Annexure II for details) OR CIF, ICD Bangalore. Port of discharge either Mumbai/Chennai (for shipment by sea)
ii	Payment Terms	<u>100% direct payment with 45 days credit from the date of :</u> a) Receipt of material for Door delivery BHEL stores b)Receipt of complete set of documents for High Sea Sales c)Invoice for Ex-works delivery	100% against sight draft with 45 days credit on negotiation of complete set of documents.
iii	Reckoning of Delivery Date	<u>For Door Delivery at BHEL Stores:-</u> Date of receipt of material at BHEL Stores. <u>For Delivery Terms of Ex-works /Negotiation of Documents Through Bank:-</u> Date of invoice <u>Where Pre Shipment Inspection at seller's works is applicable :-</u> Inspection call for the date on which material is ready for inspection supported with documents such as TC's/ COC's as applicable.	<u>For Delivery Terms of Ex-works :-</u> Date of invoice <u>For Delivery Terms of CIP/ FCA</u> Date of House Airway Bill(HAWB) / Date of receipt by BHEL's Freight Forwarder whichever is earlier <u>For Delivery Terms of CIF</u> Date of Bill of lading
iv.	Penalty for Delayed Delivery	As per clause 15 of General Conditions of Contract (DOC .NO.BHEL :EDN:GCC-SHOP:REV:00)	
v	Cancellation/ Termination of Contract & Risk Purchase	As per Clause 24 of General Conditions of Contract (DOC.NO.BHEL:EDN:GCC – SHOP :REV:00)	

2. When Bank Guaranty (BG) is applicable as per RFQ terms, the same shall be from any one of the BHEL Consortium of Banks (Refer **Annexure III**) in the prescribed format as per **Annexure IV**. The bank Guarantee shall be sent directly to BHEL by the issuing bank.

F. Commercial Deviations / Offered Terms & Loading of Offers :-

Unless specified otherwise in the RFQ and if the Purchaser decides to accept offers with deviations in respect of the standard commercial terms given at Clause No. E1 above, such offers will be subjected to loading on the **quoted basic material value** as detailed below:-

SI No	Deviation on	Nature of Deviation / Offered Terms	Loading %
i	Delivery Terms	For purchase within India :- Other than SI No.1 (i) of clause E above.	10
ii.	Payment Terms	For purchase within India :-	15
		1) Payment against delivery/Proforma payment against receipt of material	
		2) Payment against documents through bank – Delivery of material on production of consignee copy of LR	15*
		3) Credit period less than 45 days, but not less than 15 days.	10
		4) Payment against documents through bank with consignment door delivered to BHEL stores (without consignee copy of LR) and 45 days credit period.	2*
		For foreign purchase :-	10
		1) Payment through At Sight Letter of Credit	
iii	Penalty for Delayed Delivery	2) Payment through Letter of Credit with usance credit of 45 days	5
		3) Sight Draft with credit period less than 45 days	5
		1) Non – Acceptance	10
		2) Partial Acceptance (X%)	(10 – X)

* All bank charges shall be to seller's account. If bank charges of BHEL banker are to BHEL's account then **additional loading of 2% on the quoted basic value** is applicable.

NOTE: Offer/ s with payment terms other than the standard payment terms indicated at E1(ii) or Deviated Payment Terms with loading indicated at F(ii) above are liable for rejection.

G. Submission of Offers:

Offers shall be submitted as indicated below **within the due date and time** indicated in the RFQ/Any subsequent change intimated by Purchaser.

SI No.	Offer For	Mode of Submission
i	RFQs on EPS	Shall be made on the EPS (e-Procurement System) portal in line with the instructions given therein. Notes : a) To quote for the RFQs published through EPS vendors should have class III, 2048 Bit digital signature certificate (DSC) for both encryption and signing obtained from Certifying Authority (CA) authorized by Govt. of India through their Licensed Registering Authority (LRA). b) All required documents shall be uploaded before due date and time. Availability of power, internet connectivity, etc. is the sole responsibility of the bidder. Assistance required if any, may be availed from the Seller's Manual available on EPS portal of BHEL/ help line numbers of BHEL's Service Provider
ii	Other RFQs	Shall be dropped in the appropriate tender box as per details given in the RFQ OR May be Sent through post/courier/Fax/Email/EDI to the Purchase Executive/Fax No/Email ID indicated in the RFQ * * Bidders may adopt this mode at their own risk. The Purchaser does not own any responsibility / liability for delays in receipt / loss of secrecy of such offers. Such offers shall be received well in advance to enable them to be dropped in the tender box in time.

NOTE :

OFFERS RECEIVED BEYOND DUE DATE AND TIME WILL NOT BE CONSIDERED

H. Processing of Offers Received:

1. Only offers received in the mode and within the due date and time indicated in RFQ will be considered for processing.
2. The following offers may not be considered for processing
 - a) Incomplete
 - b) Conditional
 - c) With deviations other than listed in clause F above
3. If non acceptance to any of the terms & conditions of the RFQ or deviations if any are not clearly mentioned in the offer, it will be treated that all the terms & conditions of the RFQ are accepted by the bidder in total.
4. If offer is revised within the due date and time of the RFQ on e-Procurement System, latest will be available for processing. In other cases the latest offer will be considered for processing only when there is a clear indication of the same, otherwise BHEL reserves the right to consider/not consider any of the offers received.
5. **For offers on EPS, in case of any contradictions/inconsistency between the offered details on the bid template and those in the attachments, the offered details on the bid template only will be considered.**
6. If a range is given for delivery, longest duration in the given range will be considered as the quoted delivery. If any drawing / sample / technical datasheets/Quality Assurance Plan approval or Manufacturing Clearance by Purchaser is involved the quoted delivery will be considered from the date of such Approval / Clearance by the Purchaser. Bidder to clearly indicate the time (in terms of no of days / weeks from the date of PO) for submission of such Drawings /Data Sheets/ Samples/QAP to the Purchaser.
7. Changes in offer (Impact Bid)/Discounts or revised offers given after opening of Part-I bid will not be considered unless the same is sought by the Purchaser due to any change(s) in technical scope and / or specifications and / or commercial terms & conditions. In case of withdrawal of any Technical/Commercial deviation(s) by the bidder before opening of price bids, revision of price/impact bid will not be considered.
8. Any discount on the already submitted offer by the bidder on its own will be considered provided it is received on or before the due date and time of offer submission and clearly mentions "Discount offer to be considered along with the original offer "(on the envelope also). The discount will be applied on pro-rata basis to all the items unless mentioned otherwise by the bidder.
9. In case of two / three part bids, price bids of the techno-commercially accepted offers, only will be opened on a subsequent date, with prior intimation.
10. Offers considered with commercial deviations will be subject to loading as per clause F above.
11. In case BHEL decides to go for Reverse Auction Guidelines as **per Annexure V** are applicable. Only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit "**online sealed bid**" in the Reverse Auction. Non submission of "**online sealed bid**" by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue. In case BHEL decides **NOT to adopt Reverse Auction** method of bidding, the sealed price bids and price impacts if any, of all the techno commercially qualified bidders already submitted and available with BHEL shall be opened as per BHEL's standard practice.
12. Evaluation of Price bids will be done on the basis of "**Total Cost to Purchaser**" taking into consideration:
 - d) Basic material value, taxes and duties, packing and forwarding charges, freight and insurance, any other costs and loading for deviations if any, as applicable.
 - e) CENVAT/MODVAT/VAT credit benefits available to BHEL.
 - f) Calculated costs of freight, insurance and clearance charges as applicable, for foreign purchases.
 - g) RFQ item wise prices unless specified otherwise in the RFQ terms.
 - h) The offered quantity if offered quantity is more than the RFQ quantity
 - i) For offers in foreign currency, the exchange rate (TT selling rate of State Bank Of India (SBI)) will be taken as under :-

Single Part Bids: -

Date of tender opening

Two / Three part bids / Reverse Auction: -

Date of Part-1 bid opening

If the relevant day happens to be a bank holiday then the FOREX rate (TT selling rate) as on the previous bank (SBI) working day will be taken.

13. Any typographical error, totaling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per Clause 11.2.3 "Non-conformities between the figures and words of the quoted prices" of "Manual on Policies & Procedures for purchase of goods" issued by Ministry of Finance / Government of India. (Refer **Annexure VI**). BHEL's decision will be final in this regard.
14. Ranking (L-1, L-2 etc.) will be done only for the techno-commercially accepted offers.
15. Purchase Preference for MSE Vendors will be considered as per **Annexure VII**.

I. Despatch, Invoicing and Documentation :-

1. All goods shall be consigned to the Consignee details as given in the Purchase Order.
2. Quantity of goods in invoice / delivery challan shall tally with the goods delivered.
3. For delivery terms Ex-Works, the Seller shall intimate the readiness of goods to BHEL/BHEL's authorized freight forwarder/BHEL's authorized transporter and the goods shall be handed over to the BHEL's authorized freight forwarder/BHEL authorized transporter / agency assigned by BHEL. Goods can also be despatched as mutually agreed between BHEL and Seller.
4. Packing shall be road / rail / air / sea worthy as applicable for adequate protection against transit damages.
5. **Delivery timings at BHEL stores(On all working days) :-**
09.00 AM to 03.00 PM (Monday to Friday)
09.00 AM to 11.00 AM (Saturday)
Deliveries other than the timings indicated shall be done with prior permission from the purchase executive.
6. The invoice shall be in accordance with the PO duly supported with documents as called in the PO and shall contain the following details :-
BHEL PO No and PO Item no., BHEL material code and description, Quantity, Vendor's name, Address.
Invoice submitted should contain all details as specified under GST Laws.
7. The rates shall be as per applicable PO rates. Indicate the basic rate, duties & taxes as applicable along with Vendor TIN number (applicable for dispatches from within India).
8. For issue of "C" Forms duly filled up format as per **Annexure VIII** shall be sent to email id: **cform@bheledn.co.in**. For invoices w.e.f 01.07.17 this clause will not be applicable.
9. **Documents :-**
Seller shall arrange to send the documents as applicable as per **Annexure IX** to the Purchaser, along with dispatch of goods. Any addition / exclusion to such documents shall be as specified in the Purchase Order.
10. **Bidders should mention GSTIN(GST Identification number) of the place of supply and HSN (Harmonized System of Nomenclature)/SAC(Services Accounting Code) number in the invoice. In case both supply and service are involved, GSTN no of the place of supply for services shall also be mentioned separately in the offer if it's different.**
11. Applicable documents shall be submitted to the purchaser at the time of supply for availing GST input credits.
Payment of GST as applicable will be made only if it is matching with the data uploaded by suppliers.
12. Vendors to give undertaking that GST as mentioned in the invoice has been paid/will be paid either through cash or admissible input credit and also file the returns.
13. For invoices paid on Reverse charge basis- that it is "payable on reverse charge basis " to be mentioned on the invoice.

J. Information on Processing of Payment :-

1. All direct payments will be made through Electronic Fund transfer (EFT). Vendor shall furnish e-payment particulars duly authenticated by their respective Bankers as per BHEL standard format (Refer **Annexure X**), if not registered with the purchaser earlier.
2. In case of High Sea Sales and Foreign Purchases, customs clearance of the consignment landed on Indian Sea / Air ports will be done by BHEL based on the original documents provided by Seller. All warehousing charges due to delay in submission of complete and or correct documents to BHEL may be charged to Seller's account.
3. Statutory deductions, if any, will be made and the deduction certificate shall be issued. In case Seller does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.
4. Bills/Invoices will be processed for payment only if they are complete in all respects, correct and supported with relevant documents as applicable. Any delays in this regard will result in consequent delays in payment.

GENERAL CONDITIONS OF CONTRACT FOR PURCHASE

1. Applicable Conditions :-

These General Conditions of Contract for Purchase (GCP) apply to all enquiries, tenders, requests for quotations, orders and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited, Electronics Division / Electronics Systems Division (hereinafter referred to as "BHEL" or the Purchaser) or its projects / customers. Any deviations from or additions to these 'General Conditions of Contract for Purchase' require Purchaser's express written consent. The general terms of business or sale of the Seller shall not apply to the Contract. Acceptance or receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the Seller have been accepted by the Purchaser. Purchase orders, Orders, agreements and amendments thereto shall be binding if made or confirmed by the Purchaser in writing.

2. Definitions :-

Throughout these conditions and in the specifications, the following terms shall have the meanings as assigned hereunder, unless the subject matter or the context requires otherwise.

- a. **'Purchaser'** means Bharat Heavy Electricals Limited (a Central Public Sector Enterprise) incorporated under the Companies Act, 1956 having its registered office at BHEL House, Siri Fort, New Delhi-110049, India acting through its Unit Electronics Division / Electronics Systems Division at Bangalore and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- b. **'Seller'** means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the seller's successors, permitted assigns, representatives, heirs, executors and administrators, as the case may be. It may also be referred to as Contractor, Supplier or Vendor.
- c. **'Contract'** shall mean and include the Purchase Order(also referred to as the "Order" or 'PO'), letter of intent(LOI) / letter of acceptance or award(LOA) along with tender / offer / bid submitted by the Seller, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection / Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided and the samples or patterns if any to be provided under the provisions of the Contract, by the Purchaser or his representative. Any conditions or terms stipulated by the tenderer / bidder in the tender / offer / bid or subsequent letters shall not form part of the Contract unless specifically accepted in writing by the Purchaser.
- d. **'Parties to the Contract'** shall mean the Seller and the Purchaser and Party shall mean either the Seller or the Purchaser.

3. Order of Precedence:-

In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI / LOA, specific agreement, Special Conditions of Contract and General Conditions of Contract for commercial conditions; and specific agreement on technical conditions, Special Technical Conditions and General Technical conditions, RFQ / Offer.

4. Interpretation :-

In the contract, except where the context requires otherwise:-

- a. words indicating one gender include all genders;
- b. words indicating the singular also include the plural and words indicating the plural also include the singular;
- c. provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d. "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

5. Ordering and Confirmation of Order :-

The Seller shall send the acceptance of the LOI / Purchase Order within two weeks or such other period as specified/agreed by BHEL from the date of LOI / Purchase Order. Purchaser reserves the right to revoke the order placed if the order acceptance differs from the original order placed. Purchaser shall only be bound after it has agreed explicitly in writing to be in agreement with the deviations. The acceptance of deliveries or supplies by Purchaser as well as payments made in this regard shall not imply acceptance of any deviations. The Purchase order will be deemed to have been accepted by the Seller, if no communication to the contrary is received within two weeks (or the time limit as specified / agreed by the Purchaser) of the receipt of the order.

6. Execution :-

The Seller shall execute the whole contract in the most approved, substantial and workman like manner as per the contracted terms. The Seller shall comply with all laws, ordinances, rules, and regulations bearing upon the performance of its obligations under the terms of the Contract.

7. Progress Reports and Documentation :-

After receipt of Purchase Order, seller should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report, O & M Manuals and / or any other relevant documents as per Specification / Purchase Order, as indicated in the Purchase order. At any stage within the contract period, the seller shall notify of any error, fault or other defect found in BHEL's documents / specifications or any other items for reference. If and to the extent that (taking account of cost and time) any seller exercising due care would have discovered the error, fault or other defect when examining

the documents / specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the seller's documents, they shall be corrected at his cost, notwithstanding any consent or approval. The Seller shall submit periodic reports as to the progress in execution of the contract and in such form as may be called for by the Purchaser. The submission and acceptance of such reports shall not prejudice the rights of the Purchaser in any manner.

8. Product Information, Drawings and Documents :-

The Seller shall, as per agreed date / s but not later than the date of delivery, provide information and drawings which are necessary to permit the Purchaser to use, erect, commission, operate and maintain the product. Such information and drawings shall be supplied in the number of copies agreed upon.

9. Non-disclosure and Information Obligations :-

The Seller shall provide Purchaser with all information pertaining to the delivery in so far as it could be of importance to Purchaser. The Seller shall not reveal any confidential information (including price) in relation to the contract in general and those which it may acquire from the purchaser during the course of execution of the contract in particular, to its own employees not involved with the tender / Contract & its execution and delivery or to third parties, or make use of such information pertaining to any data, designs, drawings, specifications and other information furnished to it by the Purchaser, unless Seller seeks a permission to do so from the Purchaser and the Purchaser has agreed to this in writing beforehand. The Seller shall not be entitled to use the Purchaser's name in advertisements and other commercial publications without prior written permission from Purchaser.

10. Intellectual Property Rights; Licenses :-

If any patent design, trade mark, copyright, trade secret or any other intellectual property rights apply to the products / goods supplied, or delivery or accompanying documentation, Purchaser or its Customer shall be entitled to the legal use thereof free of charges by means of a non-exclusive, assignable, transferrable, sub-licensable, worldwide, perpetual license as duly granted by the owner or licensor of such right. All intellectual property rights that arise or developed during or due to the execution of the contract or delivery of the goods by the Seller and by its employees or third parties involved by the Seller for performance of the Contract belong to Purchaser. The Seller is obliged under the contract to do everything necessary to obtain or establish the above mentioned rights in favor of Purchaser. The Seller guarantees that the execution of the contract including goods and its delivery does not infringe any of the intellectual property rights of third parties. The Seller shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of such (alleged) claims by third parties, if any. The Seller agrees to indemnify, defend, and hold harmless Purchaser, its officers, employees, agents, representatives, successors, assigns, or any of the Purchaser's customers buying or using the goods or services, against any actual or alleged infringement of such intellectual property interests or claims by third parties in this regard and shall reimburse Purchaser for any liabilities, damages, penalties, injuries, claims, demands, actions, costs and expenses (including, without limitation, reasonable legal and other professional fees and expenses) suffered as a result thereof.

11. Inspection and Testing :-

Prior written notice of at least 10 days shall be given along with internal test certificates / COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL for verification / acceptance for issue of dispatch clearance. All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.

12. Quality and Condition of the Delivery :-

The Seller shall guarantee that the delivery:-

- a. Is of good quality and free from defects and in the case of services rendered that they are performed by skilled personnel and that new materials are used;
- b. corresponds exactly with the provisions of the Contract, the reasonable expectations of Purchaser regarding the characteristics, quality and reliability of the delivery;
- c. is suitable for the purpose for which it is intended by its very nature or which is evident from the specifications or the Contract;
- d. Complies with legal requirements applicable in India and other (international) Government regulations, as applicable.
- e. Complies with the customary norms and standards in the relevant branch of trade or industry.

The Seller shall be responsible for compliance with applicable technical, safety, quality, environmental requirements and other regulations in relation to its products, packaging, and raw and ancillary materials.

13. Packaging and Dispatch :-

The seller shall package the deliverables safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea / Air / Rail / Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures / hooks and sling marks as may be required for easy and safe handling by mechanical means. Each package must be marked with consignee name, P.O Number, BHEL material code, Package No., Gross weight & Net weight, Dimensions (LxBxH) and seller's name. The packing shall allow for easy removal and checking of

goods on receipt and comply with carrier's conditions of packing or established trade practices. **Packing list of goods inside each package with P.O item no.& Quantity must also be fixed securely outside the box to indicate the contents. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.**

14. Delivery :-

Delivery shall be as per Purchase Order delivery terms. Trade terms such as DDL, FOR, EXW, FOB, CFR etc., if stipulated in the order shall be construed in accordance with the version of the INCOTERMS applicable at the time of ordering, without prejudice to the provisions contained in these conditions. The delivery date(s) or delivery period(s) as stipulated in the Contract shall be firm and binding and shall apply to the entire delivery for each PO item. Partial shipments may, however, be permitted by the purchaser.

15. Penalty :-

The time or period of delivery as stipulated in the schedule of delivery shall be deemed to be the essence of the contract. Should circumstances arise whereby the deadline for an agreed delivery date(s) or period(s) is expected to be exceeded, the seller shall inform purchaser hereof without delay. If delay in delivery is caused by any of the circumstances mentioned in clause 25 (Force Majeure) or which are caused exclusively by the acts of purchaser, the purchaser shall extend the time for delivery by a period which is reasonable having regard to all the circumstances in the case.

a. For delay in documentation :-

In the event of delay in submission of complete set of documents (like drawings, bill of materials, datasheets, catalogues, quality plan etc. as called in tender specifications including soft copies wherever applicable) in required sets beyond three weeks (or as agreed / indicated in the Purchase Order) from the date of Purchase Order, penalty at 0.5% (half percent) per week or part thereof, limited to a maximum of 5% (five percent) of the basic material value of the Purchase Order will be applicable.

b. For delay in delivery :-

In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of delayed portion (basic material cost) will be applicable. Delivery will commence from the date of document approval by customer / BHEL or date of issue of manufacturing clearance, whichever is later in cases where such approval/manufacturing clearance is applicable as per PO. Where pre shipment inspection is applicable, the date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection. Penalty for delayed documentation/delayed delivery, if applicable, shall be deducted at the time of first payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted.

Imposition, recovery or settlement of this penalty shall not affect any rights of the purchaser to claim enforcement of specific performance of the contract, compensation and/or to terminate the contract.

16. Assignment of Rights & Obligations; Subcontracting:

Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.

17. Transfer of Ownership, title and Risk :-

The risk for the delivery remains with the Seller until the goods are delivered at the agreed place and acknowledged by the Purchaser/his authorized representative.

18. Price, Invoicing and Payment :-

The agreed prices are fixed prices in the currency as specified in the Purchase Order. They shall include packing, forwarding, loading and carriage to the place specified by the Purchaser and are inclusive of all applicable taxes, duties etc. except for those specifically agreed between the Seller and Purchaser. Further, Seller shall indemnify and hold harmless Purchaser from all claims and liabilities, damages, penalties, injuries, claims, demands, actions, costs and expenses (including, without limitation, reasonable legal and other professional fees and expenses) arising from Seller's failure to report or pay any taxes, tariffs or duties for which Seller is responsible. The method of invoicing shall be without prejudice to the parties' agreement as to the place of performance. Indian Agent's commission if payable and so specified in the Purchase Order shall be paid in Indian Rupees, considering the SBI TT selling exchange rate prevailing on the date of Purchase Order, after successful completion of the contract. If so stipulated in the order, the Seller shall furnish, on receipt of the Purchase Order or along with order acknowledgement, the Billing break-up of prices (BBU) for approval by the Purchaser in respect of the major items / components going into the equipment. This BBU is required by the Purchaser for admitting the claims of the Seller if part shipments are contemplated and also to facilitate custom clearance after payment of applicable duties in case of imports. Purchaser shall be entitled to suspend payment for as long as required supporting documents / details remain outstanding and any consequential demurrage / wharfage shall be to the account of the Seller. Payment

does not imply in any respect whatsoever a waiver of Purchaser's right to performance of the Contract. Purchaser is entitled to set off claimable debts against claimable liabilities with the Seller by means of a set off note.

19. Contract Variations; Increase or Decrease in the Scope of Supply :-

The purchaser may vary the contracted quantities during execution, due to exigencies of project requirements with mutual consent of the seller.

20. Guarantee / Warranty :-

Wherever required, and so provided in the specifications / Purchaser Order, the Seller shall guarantee that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance. If within the guarantee period, the delivery is found to be non-compliant including those with the stipulations in Clause 12 (Quality and Condition of Delivery) of these Conditions, the Seller shall, for its own account, replace, repair, or re-execute the delivery at Purchaser's discretion when first requested to do so within two weeks or mutually agreed period, without prejudice to Purchaser's other legal rights. If the Seller continues to default on its obligations, Purchaser has the right to proceed to replace, repair or re-execute the order at the Seller's expense, with or without help from third parties. Purchaser shall notify the Seller of the exercise of this right in advance where possible. Unless otherwise specified, guarantee period shall be minimum 12 months from the date of commissioning or 18 months from the date of supply whichever is earlier. The guarantee period shall be extended by the period during which the goods are not in compliance with the stipulations in Clause 12 (Quality and Condition of Delivery). A guarantee period as described above shall apply afresh to replaced, repaired or re executed parts of a delivery. The decision of the Purchaser in regard to the Seller's liability under this clause shall be conclusive. This clause shall survive termination / completion of contract.

21. Shortages / Replacements :-

In the event of shortage on receipt of goods and / or on opening of packages at BHEL, all such shortages shall be made good within a reasonable time that BHEL may allow from such intimation and free of cost.

22. Transit Damages :-

In the event of receipt of goods in damaged condition or having found them so upon opening of packages at BHEL Supplier shall make good of all such damages within a reasonable time from such intimation by BHEL. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed.

23. Rejection / Replacement :-

The Seller shall arrange replacement / repair under its obligation under the contract within two weeks from the date of intimation or mutually agreed period. The rejected goods shall be taken away by the Seller and replaced on DDP (Delivered duty Paid)/ FOR - BHEL Stores / designated destination basis within such period. In the event of the Seller's failure to comply, Purchaser may take appropriate action including disposal of rejections and replacements, at the cost and risk of the Seller. In case defects attributable to Seller are detected during processing of the goods at purchaser's / his subcontractor works, the Seller shall be responsible for replacement / repair of the goods as required by the Purchaser at Seller's cost. In such cases expiry of guarantee/warranty will not be applicable.

24. Cancellation / Termination of Contract and Risk Purchase :-

- a. Purchaser shall have the right to completely or partially terminate the Contract by means of written notice to that effect without prejudicing its other rights and remedies, in an event of default by the Seller :-

Events of default :-

- (i) The Seller fails to perform within the time specified in the Contract or any extension thereof;
- (ii) The Seller defaults on one or more of the obligations or program of work as contained in the Contract.
- (iii) The Seller is declared bankrupt or insolvent or is ordered to be wound up, its business has been shut down or liquidated, a substantial part of its assets have been attached, or the business has been transferred to a third party. In case of partnership firm any dissolution of partnership shall be also considered as an event of default.
- (iv) Any misrepresentation or hiding of material fact if detected at a later stage
- (v) The delivery is rejected after inspection or re-inspection.
- (vi) Export license not granted to Seller by the concerned Government.
- (vii) Incapacity of seller for any other reason to deliver or perform the contract.

BHEL shall have the right to cancel / foreclose the Order / Contract, wholly or in part, in case it is constrained to do so, on account of any decline, diminution, curtailment or stoppage of the business. In the event of termination, the risk and liability attached to the items already delivered but not of use to Purchaser, as determined by Purchaser, remains with the Seller. Such items shall then be at the Seller's disposal and they are to be collected or removed by the Seller. The Seller shall immediately refund any payments in respect of such items if already made by the Purchaser before the termination, and in any case not later than 30 days.

- b. In the event of termination due to reasons or defaults by the Seller, the Purchaser may at his option procure from any source, on such terms and in such manner as he deems appropriate, goods not delivered or others of similar description where goods exactly complying are not readily procurable, in the opinion of the Purchaser, which opinion shall be final, at the risk and cost of the Seller and the Seller shall be liable to the Purchaser for any risks and excess cost. The cost of purchases made by the Purchaser at the risk and cost of the Seller shall be worked out after loading 10% overhead / handling charges on the cost of materials and related services procured from alternate source / s. Provided, however, that the Seller shall continue the

performance of the Contract to the extent not cancelled or terminated under the provisions of this clause. The Seller shall on no account be entitled to any gain on such re-purchases by the Purchaser.

- c. Termination of the Contract, from whatever cause arising, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.

25. Force Majeure :-

Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance. A party affected by an event of force majeure shall give the other party written notice, with full details as soon as possible and in any event not later than three (3) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.. Notwithstanding above provisions, Purchaser shall reserve the right to cancel the order / Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules. Purchaser may takeover partly processed material at a mutually agreed price.

26. Indemnification :-

Vendor is fully responsible for ensuring that all legal compliances and safety guidelines are followed in course of the contract. Notwithstanding any other clause herein to the contrary, the Seller shall indemnify, hold and save harmless, and defend, at its own expense, the Purchaser, its officials, agents, servants and employees from and against all suits, claims, demands, and liability of any nature or kind, including their costs and expenses, arising out of acts or omissions of the Seller, or the Seller's employees, officers, agents or sub-contractors, in the performance of this Contract. This provision shall extend, inter alia, to claims and liability in the nature of employee's compensation and products liability. The obligations under this clause do not lapse upon termination of this Contract.

27. Non-waiver of Defaults :-

If any individual provision of the Contract is invalid, the other provisions shall not be affected.

The failure of Purchaser,

- a. To enforce any of the terms and conditions of the Contract.
- Or
- b. To exercise any right or privilege granted to Purchaser.

Under the Contract or under law shall not release the Seller from any of the warranties or obligations under the Contract and shall not be construed as a waiver thereof and the same shall continue in full force and effect.

28. Limitation of Liability :-

Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or willful misconduct. The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

29. Settlement of Disputes :-

Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies / work / services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply / work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).

30. Arbitration Clause :-

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 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 by either party to the sole arbitration of an Arbitrator appointed by the Unit head of Electronics division of BHEL. Vendor shall have no objection even if the Arbitrator so appointed is an employee of BHEL or has ever dealt / had to deal with any matter relating to this Contract. Subject as aforesaid the provisions of the Arbitration and Conciliation Act, 1996 of India or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceedings under this clause. It is a term of contract that the party initiating arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute. The venue for the arbitration shall be Bangalore, India. The award of the arbitrator shall be a speaking award and shall be final, conclusive and binding on all parties to this contract.

- a. The cost of Arbitration shall be borne equally by the parties.
- b. Notwithstanding the existence of any dispute or difference or any reference for the arbitration, the Seller shall proceed with and continue without hindrance the performance of the work under the Contract with due diligence and expedition in a professional manner.



31. Applicable Laws and Jurisdiction of Courts :-

The Contract shall be governed by the substantive laws of India. This contract shall be construed and interpreted in accordance with the laws of India and shall have exclusive jurisdiction of courts in Bangalore, Karnataka State, India.

32. General Terms:

That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents. That the headings used in this agreement are for convenience of reference only. That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.

ANNEXURE – I**BENEFITS FOR MSE SUPPLIERS AS PER MSMED ACT 2006 AND PUBLIC PROCUREMENT POLICY 2012**

MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of CA certificate (Format enclosed at page 2 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer.

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 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.

The above investment of Rs. Lacs in within permissible limit of Rs..... Lacs
for.....Micro / 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/yy) 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

ANNEXURE – II

LIST OF INTERNATIONAL GATEWAY AIRPORTS

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT

D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

ANNEXURE – III

LIST OF CONSORTIUM BANKS

BANK GUARANTEE (BG) SHALL BE ISSUED FROM THE FOLLOWING BANKS ONLY:

	Nationalized Banks		Nationalized Banks
1	Allahabad Bank	19	Vijaya Bank
2	Andhra Bank		Public Sector Banks
3	Bank of Baroda	20	IDBI
4	Canara Bank		Foreign Banks
5	Corporation Bank	21	CITI Bank N.A
6	Central Bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hong Kong and Shanghai Banking Corporation Ltd. (HSBC)
8	Indian Overseas Bank	24	Standard Chartered Bank
9	Oriental Bank of Commerce	25	The Royal Bank of Scotland N.V.
10	Punjab National Bank	26	J P Morgan
11	Punjab & Sindh Bank		Private Banks
12	State Bank of India	27	Axis Bank
13	State Bank of Hyderabad	28	The Federal Bank Limited
14	Syndicate Bank	29	HDFC Bank
15	State Bank of Travancore	30	Kotak Mahindra Bank Ltd
16	UCO Bank	31	ICICI Bank
17	Union Bank of India	32	IndusInd Bank
18	United Bank of India	33	Yes Bank

Note:

- BG should be directly sent to BHEL by the issuing Bank along with covering letter.
- All BGs must be issued from BHEL consortium banks listed above.
- BHEL may accept BG from other Public Sector Banks also which are not listed above.
- BG will not be accepted from Scheduled Banks and Co-operative Banks.
- In case BG is issued from a bank located outside Indian Territory and is issued in foreign currency, the BG must be routed through and confirmed by any one of the above mentioned consortium banks.
- This list is subject to changes. Hence vendors are requested to check this list every time before issuing BGs.

ANNEXURE-IV
BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited ¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at _____² hereinafter referred to as the 'Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Contractor having agreed to provide a Contract Performance Guarantee, equivalent to% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract, we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs ----- (Rupees -----) without any demur, immediately on a demand from the Employer, .Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We thebank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including.....⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof. Unless a demand or claim under this guarantee is made on us in writing on or before the⁷we shall be discharged from all liabilities under this guarantee thereafter. We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁸
- b) This Guarantee shall be valid up to⁹
- c) Unless the Bank is served a written claim or demand on or before¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.



We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of

(Name of the Bank)

Dated.....

Place of Issue.....

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

⁸ BG AMOUNT IN FIGURES AND WORDS.

⁹ VALIDITY DATE

¹⁰ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 2/3 months after validity date.

2. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
- b.1** In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

- b.2** In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
- b.3** The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.
- b.4** The BG should clearly specify that the demand or other document can be presented in electronic form.

**BANK GUARANTEE FOR ADVANCE**

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited ¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier).having its registered office at _____ ² (hereinafter called "the Contractor" which expression shall include its successors and permitted assigns) a contract Ref No.....dated³valued at Rs.....(Rupees -----/FC.....(in words.....) for⁴(hereinafter called the 'Contract')

AND WHEREAS the Employer has agreed to advance to the Contractor, a sum of Rs..... (Rupees..... only), equivalent to _____% of the said value of the Contract (hereinafter called "the said Advance"), upon the condition, that the said Advance shall be secured by undertaking guarantee for Rs ----- (Rupees -----)⁵ from a Bank as hereinafter appearing.

We,, (hereinafter referred to as the Bank), having registered/Head office at and a branch at being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer without any demur, merely on your first demand any sum or sums upto a maximum amount but not exceeding Rs ----- (Rupees -----).

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment hereunder and the Contractors/Supplier shall have no claim against us for making such payment.



We the ANNEXURE.....Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We Bank further agree that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including.....⁶ and shall be extended from time to time on the request of the Employer for such period as may be desired by the Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms hereof. However, unless a demand or claim under this Guarantee is made on us in writing on or before the⁷ we shall be discharged from all liabilities under this Guarantee.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁸
- b) This Guarantee shall be valid up to⁹
- d) Unless the Bank is served a written claim or demand on or before _____¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.



(Name of the Bank)

Date.....

Place of Issue.....

¹ NAME AND ADDRESS OF THE EMPLOYER I.e Bharat Heavy Electricals Limited² NAME OF VENDOR /CONTRACTOR / SUPPLIER³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE⁴ PROJECT/SUPPLY DETAILS⁵ BG AMOUNT IN FIGURES AND WORDS⁶ VALIDITY DATE⁷ DATE OF EXPIRY OF CLAIM PERIOD⁸ BG AMOUNT IN FIGURES AND WORDS⁹ VALIDITY DATE¹⁰ DATE OF EXPIRY OF CLAIM PERIOD**Note:****3. Units are advised that expiry of claim period may be kept 2/3 months after validity date.****4. In Case of Bank Guarantees submitted by Foreign Vendors-**

c. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

d. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)

b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.

- b.3** The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.
- b.4** The BG should clearly specify that the demand or other document can be presented in electronic form.

BANK GUARANTEE FOR RELEASE OF AMOUNTS WITHHELD/LIQUIDATED DAMAGES AMOUNT

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited ¹(hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) incorporated under thehaving its registered office at _____ ²(hereinafter referred to as the 'Contractor', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³valued at Rs.....(Rupees -----)/FC.....(in words.....) for⁴(hereinafter called the 'Contract')

The Contractor as per Contract should have completed the work/ supplies under the contract by.....(date). As per terms and conditions of the Contract, the Employer is entitled to levy Liquidated Damages (LD) for delays and the Employer has withheld an amount of Rsby way of LD as per the Contract.. Now, on the request of the Contractor, the Employer having agreed to release the amount of Rs.....withheld from the Contractor's invoices as Liquidated damages under the terms and conditions of the Contract on production of a Bank Guarantee for Rs. _____ (Rupees.....only) ⁵

We,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount of Rs ----- (Rupees -----) without any demur, merely on a demand from the Employer

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.

_____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We thebank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged. We BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's/ Supplier's liabilities.

This Guarantee shall remain in force upto and including.....⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof. Unless a demand or claim under this guarantee is made on us in writing on or before the⁷we shall be discharged from all liabilities under this guarantee thereafter.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁸
- b) This Guarantee shall be valid up to⁹
- e) Unless the Bank is served a written claim or demand on or before¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of

(Name of the Bank)

Dated.....

Place of Issue.....

¹ NAME AND ADDRESS OF THE EMPLOYER I.e Bharat Heavy Electricals Limited.

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

⁸ BG AMOUNT IN FIGURES AND WORDS.

⁹ VALIDITY DATE

¹⁰ DATE OF EXPIRY OF CLAIM PERIOD

Note:

- 5. Units are advised that expiry of claim period may be kept 2/3 months after validity date.
- 6. In Case of Bank Guarantees submitted by Foreign Vendors-

e. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

f. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)

- b.1** In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
- b.2** **In case, Foreign Vendors intend to provide BG from** Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
- b.3** The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.
- b.4** The BG should clearly specify that the demand or other document can be presented in electronic form.

BANK GUARANTEE FOR SUPPLY FREE ISSUE MATERIAL.

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier).having its registered office at _____² (hereinafter referred to as the 'Contractor/Supplier/Fabricator' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref. No.....dated³ valued at Rs.....(Rupees -----)/FC.....(in words.....) for⁴(hereinafter called the 'Contract')

and, the Employer having agreed as per the terms and conditions of the Contract to supply free issue material costing Rs._____ for the manufacture/fabrication of the equipment at the Contractor's site on on furnishing a Bank Guarantee for Rs._____ (Rupees.....)⁵in the manner hereinafter specified for the due safeguard of the free issue material,

we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount of Rs ----- (Rupees -----) without any demur, merely on a demand from the Employer, .

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.

_____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment hereunder and the Contractors/Supplier shall have no claim against us for making such payment.

We theBank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We Bank further agree that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor/Supplier/ Fabricator and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's/Supplier's/ Fabricator's liabilities.

This Guarantee shall remain in force upto and including.....⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/ Supplier/ Fabricator but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the⁷we shall be discharged from all liabilities under this guarantee thereafter.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing. Notwithstanding anything to the contrary contained hereinabove:

f) The liability of the Bank under this Guarantee shall not exceed.....⁸



g) This Guarantee shall be valid up to⁹

- h) Unless the Bank is served a written claim or demand on or before¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of

(Name of the Bank)

Dated.....

Place of Issue.....

¹ NAME AND ADDRESS OF THE EMPLOYER. I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER .

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

⁸ BG AMOUNT IN FIGURES AND WORDS.

⁹ VALIDITY DATE

¹⁰ DATE OF EXPIRY OF CLAIM PERIOD

Note:

7. Units are advised that expiry of claim period may be kept 2/3 months after validity date.

8. In Case of Bank Guarantees submitted by Foreign Vendors-

g. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

h. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)

b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the

Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter-Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.

b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.

b.4 The BG should clearly specify that the demand or other document can be presented in electronic form.

PROFORMA OF BANK GUARANTEE (in lieu of SECURITY DEPOSIT)

In consideration of the Bharat Heavy Electricals Limited¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having agreed to exempt (Name of the Vendor / Contractor / Supplier) having its registered office at _____² (hereinafter called the said Contractor which term includes supplier), from demand under the terms and conditions of the Contract reference No. _____ dated _____³ valued at Rs.....⁴ (Rupees -----)⁴ (hereinafter called the said Contract) of Security Deposit for the due fulfilment by the said contractor of the terms and conditions contained in the said Contract, on production of a Bank Guarantee for Rs. _____⁵ (Rupees _____ only), we _____ (indicate the name and address of the Bank) having its Head Office at _____ (address of the head Office) (hereinafter referred to as the Bank) at the request of _____ [Contractor(s)] do hereby undertake to pay to the Employer an amount not exceeding Rs. _____ in the event of any breach by the said Contractor(s) of any of the terms and conditions contained in the said Contract.

We, _____ (indicate the name of the Bank), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Employer. Any such demand made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this guarantee shall be a valid discharge of our liability for payment hereunder and the Contractor(s) shall have no claim against us for making such payment. We, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claim satisfied or discharged or till _____⁶ office/Department/Division of Bharat Heavy Electricals Limited certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said contractor(s) and also including the satisfactory performance of the equipment during guarantee period and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the _____⁷, we shall be discharged from all the liability under this guarantee thereafter.

We, _____ (indicate the name of the Bank) further agree with the Employer that the Employer shall have the fullest

liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

We,..... BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- i) The liability of the Bank under this Guarantee shall not exceed.....⁸
- j) This Guarantee shall be valid up to⁹
- k) Unless the Bank is served a written claim or demand on or before¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, (indicate the name of the Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Date _____ Day of _____

for (indicate the name of the Bank)

(Signature of Authorised signatory)

* This date to be indicated should not be earlier than 60 days after the date contemplated under the contract.

¹ NAME AND ADDRESS OF THE EMPLOER. I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER .

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

⁸ BG AMOUNT IN FIGURES AND WORDS.

⁹ VALIDITY DATE

¹⁰ DATE OF EXPIRY OF CLAIM PERIOD

Note:

9. Units are advised that expiry of claim period may be kept 2/3 months after validity date.

10. In Case of Bank Guarantees submitted by Foreign Vendors-

- i. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- j. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
- b.1** In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
- b.2** **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
- b.3** The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.
- b.4** The BG should clearly specify that the demand or other document can be presented in electronic form.

ANNEXURE- V**Process Compliance Form for RA**

(The bidders are required to print this on their company's letterhead and sign, stamp before faxing)

To
- M/s. {Service provider
- Postal address}

Sub: Agreement to the Process related Terms and Conditions

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no.{.....} dt. {.....}

This letter is to confirm that:

- 1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.
- 2) We have studied the Reverse Auction Terms & Conditions and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
- 4) We also confirm that, in case we become L1 bidder, we will email/ fax the price confirmation & break up of our quoted price (including that of line items) as per pg.7 of Annexure- V within two working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {Service provider.}

We, hereby confirm that we will honor the Bids placed by us during the auction process. With regards
Signature with company seal

Name –

Company / Organization
Designation within Company / Organization
Address of Company / Organization

- Sign this document and Fax it to M/s {Service provider} at {.....} prior to start of the Event.

- Attach a signed copy of the RFQ document along with the Agreement Form/ Process Compliance form and d/s{Service provider}

**RA price confirmation and breakup****To**

- **M/s. Service provider**
- **Postal address**

CC: M/s BHEL

{Unit- Address-}

Sub: **Final price quoted during Reverse Auction and price breakup**

Dear Sir,

We confirm that we have quoted.

Rs.{_____} for item covered under tender enquiry No. {...} dt.{...}

Total price of the items covered under above cited enquiries is inclusive of {Packing & forwarding, E.D., C.S.T., freight and insurance charges upto {.....} District,{.....} State and Type Test Charges etc., (exclusive of service tax), other as per NIT} as our final landed prices as quoted during the Reverse Auction conducted today {date} which will be valid for a period of {__} days.

The price break-up including that of line items is as given below.

Total - Rs.

Thanking you and looking forward to the valuable order from BHEL. Yours

sincerely,

For _____

Name: Company: Date:
Seal

ANNEXURE- VI

EXTRACT FROM “MANUAL ON POLICIES & PROCEDURES FOR PURCHASE OF GOODS”

11.2.3. Non-conformities between the figures and words of the quoted prices:

Sometimes, non-conformities/errors are also observed between the quoted prices in figures and that in words. The same is to be taken care of as indicated below:

(a) If, in the price structure quoted for the required goods, 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 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.

(b) 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; and

(c) 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 to (a) and (b) above.

If there is such discrepancy in an offer, the same is to 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.

ANNEXURE – VII

PURCHASE PREFERENCE FOR MSE VENDORS:

- a. MSE vendors quoting within a price band of $L1 + 15\%$ shall be allowed to supply up to 20% of the requirement against this tender provided
- b. The MSE vendor matches the L1 price c. L1 price is from a non MSE vendor
- d. L1 price will be offered to the nearest vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2) next ranking vendor will be offered who is within the $L1 + 15\%$ band (if L3 is also within 15% band).
- e. 20% of the 20% (i.e. 4% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) and (2) are fulfilled.



VENDOR CODE ALLOTTED BY BHEL :-

[illegible]

ANNEXURE – IX

LIST OF DOCUMENTS TO BE SUBMITTED DURING DESPATCH OF GOODS :-

Seller shall arrange to send the following documents to the Purchaser, immediately on dispatch of goods: Any addition / exclusion to such documents shall be as specified in the Purchase Order.

For despatches from within India :-

To be sent with the material			To be sent to purchase executive		
1	Delivery challan	(1 copy)	1	GST invoice * – “Original for Buyer”	(1 original + 1 extra copy)
2	GST invoice* – “duplicate for transporter”.	(1 copy)	2	Inspection report / Test report Test certificate (if called for in the PO)	(1 copy)
3	Transporters docket if received through transporter	(1 copy)	3	Warranty certificate(if called for in the PO)	(1 copy)
4	Inspection report / Test report Test certificate (if called for in the PO)	(1 copy)	4	Original money receipt for freight/service charges if applicable	Copy)

*The invoice shall contain all details as mentioned in GST invoice rules

For despatches from outside India :-

To be given to BHEL Freight Forwarder	To be submitted to bank
Invoice & Packing list	Set of documents as per PO / LC

ANNEXURE – X
Electronic Funds Transfer (EFT) OR Paylink Direct Credit Form

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

TYPE OF REQUEST(Tick one): _____ CREATE _____ CHANGE

BHEL Vendor / Supplier Code:	
Company Name :	
Permanent Account Number(PAN):	
Address	

City: _____	PINCODE _____	STATE _____	
-------------	---------------	-------------	--

Contact Person(s)	
Telephone No:	
Fax No:	
e-mail id:	

1	Bank Name:	
2	Bank Address:	
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:

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 _____

~~Please return completed form along with a blank cancelled cheque or photocopy thereof to: Bharath Heavy Electricals Ltd,~~

Attn:

Electronics Division, Mysore Road, BANGALORE - 560 026

In case of any Query, please call : concerned Purchase Executive