Expression of Interest For
Digitalized Plant Asset Management (DigiPAM)

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1. INTRODUCTION:

BHEL is the largest engineering and manufacturing enterprise in India in the energy related/ infrastructure sector, today. BHEL was established more than 50 years ago, ushering in the indigenous Heavy Electrical Equipment industry in India - a dream that has been more than realized with a well-recognized track record of performance. The company has been paying dividends since 1976-77.

BHEL manufactures over 180 products under 30 major product groups and caters to core sectors of the Indian Economy viz., Power Generation & Transmission, Industry, Transportation, Telecommunication, Renewable Energy, etc. The wide network of BHEL's 16 manufacturing divisions, four Power Sector regional centers, over 100 project sites, 8 service centers and 15 regional offices, enables the Company to promptly serve its customers and provide them with suitable products, Systems and services. The high level of quality & reliability of its products is due to the emphasis on designing, engineering and manufacturing to international standards by acquiring and adapting some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centers.

BHEL's vision is to become a global engineering enterprise providing solutions for a better tomorrow. The company is striving to give shape to its aspirations and fulfill the expectations of the country to become a global player as well as ‘Aatmnirbhar Bharat’ while Making in India.

“Digital” has become the most significant trend that is driving the industry thought process today. As in each of earlier Industrial revolutions, hitting the

prevelant limits of productivity and efficiency with existing technologies and processes led to invention of new technologies and processes. This is evident in the transitions from steam and rail in Industrial revolution-1 (1750s) to Electricity & Telephone in Industrial revolution-2 (1870s) to Computer & Automation in Industrial revolution-3 (1970s). Presently, digital technologies are promising to provide the new source of productivity and efficiency improvement with better reliability and safety, thus initiating the new industrial revolution which is also being referred to as fourth Industrial Revolution (Industry 4.0).

2. OBJECTIVE

A Digital Enterprise is an organization that leverages technology in its internal and external operations to increase competitive advantage & profitability.

In view of the same, BHEL has taken up a drive to offer Digital Transformation products and services to prospective customers. As a part of the same an initiative termed as Digitalised Plant Asset Management (DigiPAM) has been conceptualized. The solution is intended for the optimization of maintenance process along with simplifying the monitoring and management of data.

BHEL is looking for partner(s) who have proven solutions as per PQR in minimum one category of DigiPAM listed below. In case, the prospective partners can provide solutions through their vendors in areas other than their core competence (for which they have proven solutions as per PQR), the same may also be detailed in their offer. The prospective partner(s) shall carry out supply, installation and commissioning of any or all of systems/solutions as mentioned below under Digitalized Plant Asset Management (DigiPAM) initiative, for which he has submitted his offer. This EOI should however not be construed as an offer for partnership with BHEL and BHEL is not bound to enter into partnership based on response to this EOI.

The Digitalised Plant Asset Management (DigiPAM) solution has been envisaged to consist of the following broad components: (Refer clause 3.0 Scope of work for details):

1. Reliability Centered Maintenance (RCM)
2. Application of IIoT in Industry (AII)
3. Digital Worker (DW)
4. Asset Information Management (AIM)
5. Industrial Wireless Network (IWN)

The solution is intended to improve the reliability, availability and strike a balance between availability, cost & risk with respect to the power generating assets of the station, in turn optimize the maintenance operation.

The objective is to identify partners for supply, installation and commissioning of any or all of systems/solutions as mentioned above under Digitalized Plant Asset Management (DigiPAM) initiative.

BHEL invites Expression of Interest from partners who have experience in supply, installation and commissioning of any of the systems under Digitalised Plant Asset Management (DigiPAM) initiative as per PQR.

3. SCOPE OF WORK

The partners scope shall include supply of hardware & software, design, engineering, material procurement, fabrication, programming, testing, packing, unloading, storage, shipping, erection, installation, commissioning and site acceptance testing, warranty, AMC services with all related services in accordance with the requirements.

Bidder to provide technical catalogues, detailed technical writeups and documents, system architecture etc. at the time of submission of offer for this EOI.

i) Reliability Centric Maintenance (RCM)

Reliability Centric Maintenance (RCM) Software solutions shall consist of the following broad components:

Reliability Centric Maintenance (RCM) Software: The scope of supply shall include supply and implementation of the software and hardware (design, engineering, installation & commissioning) for RCM (including communication interfaces). The Contractor has to implement all the functionalities of the RCM software which includes but not limited to establishing the required interfacing with existing systems, asset criticality analysis, asset health index creation, generation of KPIs, linking of notifications etc. This shall also include configuration/development of applicable logs, reports and databases, as per Employer's requirements. The offered RCM software has to adhere to SAE standards - **JA1011_199908** or equivalent.

The system shall be provided for the following features:

1. Amendable risk matrix along with criticality/ class of Equipments. Asset segregation not limited only to Critical equipment's but also for equipment's having high repeat Work orders/ High Partial loss/ High Forced Outage or as per user requirement.

2. Asset operating context, performance standards & boundaries of the asset along with Capability of carrying out system directed RCA with least user intervention & also have user directed/ user opinioned RCA as additional feature.

3. Life cycle costing tool, stochastic analysis, Weibull tool, RLA & FRO. The results of these tools should be there in the final report not only for all critical

equipments but also for equipments having high Repeat work orders / High PL/ High forced outage OR as per user requirement.

4. Probability Vs Consequence based Risk assessment for all failure modes, equipments & their ranking. A two way interaction/ support between RCM tool & SAP for retrieving data from SAP & sending maintenance plan defined/ guided by RCM software on intermittent / as per user defined basis but with least user intervention/ with one click or least number of steps not more than 2.

5. Capability of carrying out system directed RCA with least user intervention along with user directed/ user opinioned RCA as additional feature.

6. Formation, tracking & organization of RCM / FMEA analysis & Assessment, appraising and release of the results. Well defined methodology /Mechanism to measure the effectiveness of the RCM analysis, and notify the team when the goals of the analysis are not being achieved.

7. Linking of failure rate & failure mode in SAP PM (notification) with specific functional location or equipment to highlight the need for review or updating of maintenance plan defined by RCM/FMEA based on failure historical data.

8. Capability to handle different types of events such as production/ generation loss or recurring equipment failures, environmental, health & safety & also analysis of failure events. Capacity to visually analyze events (fault tree diagram) by organizing failure modes, hypotheses and root causes.

9. Capability to track the effectiveness of implemented recommendations and notify the equipment owner when they are not effective. Capability to handle different types of events such as production/ generation loss or recurring equipment failures, environmental, health & safety & also analysis of failure events. Capacity to visually analyze events (fault tree diagram) by organizing failure modes, hypotheses and root causes.

10. It should also provide input (root cause) to the Failure Mode Effect Analysis for reviewing existing/new failure mode derived from RCA analysis.

11. Provision to integrate all design data/ information, PID, schematics & HBD along with equipment hierarchy & functional location structure to support the data analysis. Also allow user to attach document to each system/equipment.

12. Capability to pull & integrate data from different/multiple condition-based and stored value sources to calculate asset health index or asset score. Facility to carry out calculations and business logic on data from one or more condition-based data or stored value sources to output recommendations, email, indicators and other values.

13. Logic tree (includes: probability vs consequences of failure, redundancy, equipment criticality, technical constraints, OEM recommendations & or other necessary parameters) to identify a maintenance strategy for an equipment/ system.

14. Ability to calculate life cycle cost based on different scenario's like do nothing different/ existing system OR with some repair/ replacement plan using available data.

15. Selection of Optimized maintenance plan after collation of data from data analysis, FMEA, RCA, maintenance cost, lifecycle cost etc. & suggest user for run/repair/replace an equipment.

16. Tracking & updating maintenance plan & KPIs in SAP & trigger of alerts and highlight concerned area. Capability to set alarm states for multiple high and/or low conditions & should have the ability to acknowledge & track alarms along with tracker credentials.

17. Capability to allocate AMC/ Maintenance contract cost across equipment's based on time duration of maintenance of different equipment's. It should also allow user to change/ remove cost heads from considerations before optimizing a maintenance plan.

18. The RCM / Asset health work process shall have: Asset health manager & Rounds.

19. The RCM/Asset Health Module shall constitute health indicators based on strategic actions for the asset to facilitate linking of Health indicators to Tags and events from various other sources but not limiting to System ONE, Emerson AMS Suite, Bentley- Ivara, GE-APM, Exaquantum, LIMS and other hand held devices etc.

20. Have capability of extracting necessary data like :SAP Failure Data, CBM data from PI & other hand held tools, Defining Maintenance strategies/ frequency for PM/CBM/SD/OH, Task list for different Maintenance strategies, failure codes of an equipment/ asset, Material issue & Material cost along with service cost, Class characteristics of various equipment's along with Condition monitoring & failure cost, Capability to track down raised notifications FMEA, Material issue & Material cost along with service cost, Class characteristics of various equipment's along with Condition monitoring & failure cost, Capability to track down raised notifications FMEA/RCA.

21. It must have stochastic technique such as Weibull analysis, Monte Carlo simulation, to predict the operation of the equipment and failure probability. These software's should be one click solution provider (not iterative one). Failure elimination process is focused on identifying past failures and eliminating future failures (understand asset performance, Identify opportunities Identify for solution findings & implementation & tracking of performance.

22. It must have dashboards (predefined/ customized) which present daily /weekly/monthly/ quarterly/ annual task for user scrutiny & permission to enter CBM data.

23. it has an ability to analyze PM/CBM/OH/SD strategies and suggest the correct strategy for the equipment & failure trends for an equipment to identify the right maintenance plan such as PM/CBM/OH strategies and also direct tool directed optimization along with user guided optimization of maintenance frequency to be set for the tasks identified.

24. Provision for configurable report templates presenting asset performance information eg Indicator panels (metrics), KPIs dashboards & equipment failure reports e.g. Bad Actor, MTBF and MTBR and effectiveness of maintenance tasks.

Information defining scope for various modules/applications/tools covered in the desired Asset Performance Management Solution	
Sl.No:	Description
	RCM Solution
a)	RCM Solution (Hardware and Software)
b)	Service for RCM tool configuration for all assets of a Station
c)	The Contractor has to implement all the functionalities of the RCM software for all the assets of Station, which includes but not limited to establishing the required interfacing with existing systems, asset criticality analysis, asset health index creation, generation of KPIs, linking of notifications etc.
d)	Service for RCM Implementation - Development of RCM/FMEA analysis for all critical & non critical equipment as per EPRI criticality Matrix and Top equipment of concern in total not limited to Risk Plot, Risk Grid, work order, PL(partial loss), FO(forced Outage), etc.
e)	Handholding for the software for a period of two years after the successful completion of Site Acceptance Test.

ii) Application of IIoT in Industry (AII)

IIOT solutions will include providing additional measurements for continuous/periodic condition monitoring of equipment. These solutions shall include both permanently mounted wireless devices and portable wireless devices as per the application requirements. The scope of work will include selection of suitable measuring instrument for the application, installation and commissioning of the same on the equipment as per requirement. The various

IIoT solutions in the scope of this project can be categorized under the following heads:

i. Real-time Equipment and Process Monitoring inside plant boundary: This shall include wireless sensors/transmitters provided with fixed mounting arrangement. These sensors shall be located at various locations both in main plant area and off-site areas inside plant boundary. The protocol for communication for these wireless sensors shall be an open protocol, to be used by other vendors, i.e. applicable products (sensors/transmitters and wireless equipment like gateways) are available from multiple vendors. Employer should not be bound to buy equipment from only one vendor and it shall be possible to seamlessly and easily integrate equipment of other makes with the system supplied.

ii. Real-Equipment and Process Monitoring for areas outside plant boundary: This system shall comprise of sensors/transmitters for equipment at a certain distance from plant and located outside plant boundary. The system shall provide provision to both mount the sensors permanently or temporarily for a certain period in such offsite areas. The system shall be provided with easy user friendly interface allowing user to add and configure different type of sensors/transmitters - both permanent and temporary. These sensors shall communicate data from such off-site locations to the system inside plant over mobile technology/connectivity, etc. The contractor shall consider setting up of a local wireless network so that data from various sensors is first collated in a central server/gateway before the same is transmitted to main plant.

iii. Condition Monitoring: This shall involve sensors that can be temporarily mounted on a particular equipment for a particular period and values can be recorded or transmitted to the system wirelessly on the wireless network, at the preconfigured frequency. It shall be possible to configure the sensors in the system to map the value being transmitted by this sensor/transmitter to the particular parameter of an equipment in SAP Asset Hierarchy list. The type of such sensors to be supplied by the

Contractor have been indicated below. It shall be possible to carry these sensors to the desired location and mount them on the equipment and configure (including mapping) them in the field using handheld tablets.

Information defining scope for various modules/applications/tools covered in the desired IIOT Solution	
Sl.No:	Description
1	Real time Equipment and Process Monitoring inside plant boundary Wireless Sensor/Transmitters (along with required Gateway to connect to Plant Wireless Network)
	a.i) Non- Intrusive Sensors/Transmitters for Vibration measurement
	a.ii) Non- Intrusive Sensors/Transmitters for Vibration measurement (Displacement Type)
	b) Hydrogen Leak Detection Sensors/Transmitters
	c) Partial Discharge Monitoring Sensors/Transmitters
	d) Lux Level Measurement (Sensors/Transmitters)
	e) Level Measurement Sensor/Transmitters
	f) Pressure Sensors/Transmitters
	g) Air Flow Sensors/Transmitters
	h) Non- Intrusive Sensors/Transmitters for Temperature measurement
	i) Gas , liquid flow measurement, analytical measurement, PH , gas composition etc sensors to be added
2	Real time Equipment and Process Monitoring for areas outside plant boundary Wireless Sensor/Transmitters (along with required Gateways to transmit data to main plant boundary) for the following parameters:

	a) Humidity Measurement (Sensors/Transmitters)
	b) Temperature Measurement (Sensors/Transmitters)
	c) Wind Speed Measurement (Sensors/Transmitters)
	d) Lux Level Measurement (Sensors/Transmitters)
	e) Voltage Measurement (Sensors/Transmitters) including suitable Potential Transformers (PT) in the areas as applicable Note: The accuracy of the final of the complete system shall be 99%.
	f) Chlorine Concentration Measurement (Sensors/Transmitters)
	g) Non- Intrusive Vibration Measurement (Sensors/Transmitters)
	h) Level Measurement Sensor/Transmitters
3	Condition monitoring Wireless Sensors/Transmitters:
	a) Portable Wireless Non- Intrusive Sensors for Vibration measurement (of these some shall be PESO Certified)
	b) Portable Wireless Non- Intrusive Sensors for Temperature measurement
	c) Portable Wireless Temperature Transmitters (0 to 800 deg C) (Refer Note)*
	d) Portable Wireless Sensors/Transmitters for Voltage Measurement (0-30 VDC)
	e) Portable Wireless Sensors/Transmitters for Voltage Measurement (0-50VDC)
	f) Portable Wireless Sensors/Transmitters including dismountable Current Transformer (if needed) for DC Current Measurement in range 0-100 Amp
	g) Portable Wireless Sensors/Transmitters including dismountable Current Transformer (if needed) for DC for Current Measurement in range 0-200 Amp

	h) Portable Wireless Sensors/Transmitters including dismountable Current Transformer (if needed) for DC for Current Measurement in range 0-300 Amp

Note *

The sensors/transmitters shall be suitable for applications/areas.

These shall be suitable to be interfaced to RTDs and Thermocouples, which shall be made available by Employer at site. Suitable mounting fixtures for the transmitters shall be provided by the Contractor.

iii) Digital Worker (DW)

i. Mobility Applications: Contractor shall provide various applications for use by operator in field on mobile devices (Rugged Tablets and Employer's mobile devices - BYOD). These mobile applications shall be used for capturing metadata of various plant parameters through local rounds/inspections by plant operators including images/videos of unsafe conditions, provide access to DCS data, SOPs using Rugged Mobile Tablets along with support for Employers BYOD devices over Wifi from wireless mesh network. All necessary bar coding/QR coding of assets etc. shall be in the scope of Contractor. The configurations for operator rounds for equipment and the requisite wireless infrastructure shall also be in the scope of the Contractor.

ii. Realwear or equivalent make based Digital Helmet /Connected Digital Worker-Skill Center: The solution shall combine hands-free wearable device to provide guided work instructions & procedures on site through playback of video captured by expert personnel working on similar tasks searchable using voice. This will also support access to remote experts via video chat, who can see what the field personnel sees, to advice/guide/verify the field operation. The

configuration for all equipment and the requisite wireless infrastructure shall also be in the scope of the Contractor.

iii. Real time location tracking system (RTLS): The system shall be used to track the location of operators, field workers and other employees in the plant premises on real time basis. All the areas where operator rounds shall be undertaken shall be covered real time location tracking of employees. As a minimum complete main plant area shall be covered with the system. The scope of work shall include design, supply, installation, testing and commissioning of RTLS along with the supply of associated wearable tags. Other relevant details have been indicated at relevant section in the specifications.

Information defining scope for various modules/applications/tools covered in the desired Digital worker Solution	
Sl.No:	**Description**
1	Realwear/Equivalent based Digital Helmet / Connected Digital Worker-Skill Center
2	Digital worker Mobility Applications for entire plant (License) configured for equipment as per the scope in the relevant areas
3	4G based Rugged Mobile Tablets
4	Wifi based Rugged Mobile Tablets
5	No. of Employers' employees' BYOD devices over Wifi to be supported in the system
6 a)	Real Time Location Tracking System
6 b)	Tags for Real Time Location Tracking System

iv) Asset Information Management (AIM)

This shall include total solution for the following components including supply of software, hardware, implementation, AMC services:

i. Intelligent 3D Modelling: This application shall be used for capturing of up-to-date as-is/as-built physical plant using suitable scanning technology for building 3D model. The scanning activity shall not be a hindrance to normal plant

operations. To support the activity Employer shall only provide the available hard and soft copy of various plant drawings, but correlating them with actual plan condition shall be the responsibility of the Contractor, since the drawings can be old and the plant might have undergone changes over the period of time. The finally developed model shall be in sync with the actual site conditions only. The scope of work shall include complete modelling of plant premises.

ii. Creation of Intelligent P&IDs and interlinking with 3D model

iii. Digitization of plants documents and drawings and Inter-Linking of the 3D model with document, Intelligent P&IDs, 2-D drawings and document etc.

Information defining scope for various modules/applications/tools covered in the desired Asset Information Management(AIM) Solution	
Sl.No:	**Description**
1a)	3D Modelling of plant as per the scope
1b)	Hardware and licensed Software needed for functionality to be provided for built model.
2 a)	Smart Documentation Tools - License for the software and the associated hardware
2 b)	Digitization of plant document as per the scope and linking of those documents with Assets for documents (of various sizes) including creation of Smart P&IDs which shall involve:
	(i) Documents available in hard copy need to digitized and meta data generated, with Contractor supplied tool
	(ii) Documents available in soft need to uploaded and generate meta data in Contractor supplied tool

v) Industrial Wireless Network:

Contractor is supposed to setup an industrial wireless private network that will provide connectivity to multiple services (inside the plant boundary and off-site areas) which are being established as part of this initiative such as wireless IIOT sensors (data), digital worker mobile application (data, audio, video), digital helmet solution (data, audio, video), real time location tracking solution etc. The

wireless network should be suitable for the plant/ industry environment i.e. the system shall be immune to the electromagnetic interferences of various equipment in the power plant/ industry, withstand outdoor temperature, humidity and dust requirements etc.

Information defining scope for various modules/applications/tools covered in the desired Industrial Wireless Network Solution	
Sl.No:	**Description**
1	Wireless Infrastructure for complete station inside plant boundary
	- Wireless LAN Controller and Management System
	- (NAACMS) / RADIUS / LDAP Server
	-Indoor/Outdoor Access Points
	-CWLMS
	- Log collection Analyzer / Syslog Management Server
	- Switches and other network hardware, POE injectors etc.
2	Redundant set of Firewalls (UTMs) for interface with Employer's systems {These firewalls shall be configured in High Availability mode}
3	Redundant set of Firewalls (UTMs) and required hardware for Remote Support Link(s) and field connectivity wireless networks {These firewalls shall be configured in High Availability mode}
4	Redundant Router

4. GENERAL INSTRUCTIONS TO BIDDERS (Common features of all solutions under DigiPAM initiative)

The solution envisaged for the project shall be private cloud based solution (on premise). The various applications in the solution shall either have platform (IIoT Platform) based integration or standalone application level integration with compatible mobile apps and web server access. The integrated implementation shall comply with the following requirements:

1. The integration shall provide seamless access to various applications/systems envisaged as part of the complete solution. The solution shall provide user with a common GUI for all the applications and functionalities/features envisaged as a part of the solution. However, it shall be allowed that certain specific system administration activities for a specific application be either performed through application inherent interface on a separate web interface window or at the target hardware (for example servers, etc.). Any such interface shall be engineered with appropriate access control measures, for example defined user logins with passwords complying with Employer's password management policy.

2. Partner will be provided with single (only one no.) interface corresponding to each of DCS systems for any kind of data that may be required by various applications that are part of the DigiPAM solution. It shall be possible to use data sourced from DCS systems in any of the solution components. Also, the data sourced from various systems shall be available on the common user interface of the system.

3. Contractor's system shall be required to provide interface with the following systems ensuring all security provisions such as firewalls (UTMs), etc. as relevant. Please refer table at the end of this chapter for details about the interfacing.

a. SAP – Enterprise Asset Management system.

b. PI Servers (for DDCMIS & other data):

c. IT Network: Interface with IT systems like Active Directory and provide web based access to the applications

d. Online Dissolved Gas Analysis (DGA) system for transformers.

e. Oil Analysis system: Oil Analysis System for Electrical equipment.

f. Lab Information Management Systems: Chemistry lab system.

g. IR Thermography: Provision should be made in the system to upload the images captured using IR Thermography systems to contractor's system and map the same to Asset Hierarchy List.

4. The system shall provide user with proper access rights facility to manually enter CBM (Condition Based Monitoring) data.

5. The integrated system shall also be provided with following generic system features:

i. Workflow Management System with collaborative environment: The system shall support a fully integrated workflow management system with a collaborative environment allowing users to comment, initiate discussions, attach external files (drawings and other documents), have well defined SOPs and features to generate & print user defined/configured reports across any equipment/system/unit/plant level. The system shall provide facility to either automatically or manually create a workflow once a designated event has been generated (for example notification from RCM or Digital Worker Application).

ii. User Interface System: The above mentioned workflow shall be part of the User Interface of the system which shall having the following features:

a. Configurable dashboard type of environment capable to include dynamically updating data sourced from various applications employing graphics, plots, trends and other visualization tools. The User Interface of the system shall thus allow user to access data for all components/applications of the solution, which shall include monitoring of various events, triggered actions/notifications/workflows, etc.

b. The system shall show actionable information, provide workflow support and tools to mine the captured knowledge (archived as part of knowledge repository, details of which has been included later). The UI shall employ graphics,

plots & trends and dashboards with KPIs in an easy user interface for displaying its content in real-time. It shall have provision to add/remove/customize KPIs as per the requirement. It shall be possible to incorporate the SOPs (Standard Operating Procedures) in the system either embedded in the workflow or as separate files (in a suitable format) in the workflow. The SOPs shall be customizable as per requirements

c. System should allow users to raise questions and supply answers in a collaborative environment easily accessible from the GUI. The forum for commenting can also be used for this purpose. The collaborative environment can be part of the partner provided software based integration or any third party software integrated with the system. However, in any case the system should have seamless integration with system GUI.

d. System shall provide dynamic access in real time to actual data, processed data & other data generated by different applications that are part of the solution or the data that shall be sourced from various systems, for viewing in standard user interfaces like trends, plots, overlay, etc.

e. System should have a standard reporting feature for generating user defined and configurable reports on demand and at specified time intervals.

f. The system shall be provided with a web based user interface making it possible to access the same from any of the systems in internal network. The no. of concurrent users for the system shall be provided. The contractor shall be required to accordingly do the hardware sizing.

iii. Mobile Interface: The workflow and the other user interfaces of the system in general shall have the facility to be available on the mobile devices with compatible mobile apps or other means. If a single mobile app cannot act as mobile user interface for any/some of the applications that are part of the solution then the mobility application interface shall also be provided for all such applications.

iv. Knowledge Repository: The system shall provide/host a knowledge repository kind of application with the following facilities:

a. The knowledge repository shall continuously store all input data, processed data and other data (user comments, expert opinion, closing notes/annotations and other workflow related data tagged with equipment, incident type, date, time, unit/system etc.) generated by the various system features and the applications that form part of the system, with minimum 6 years period data available online. Beyond that period facility shall be provided to archive the data for use at any time in the future.

b. The knowledge repository shall have strong categorized indexing and advanced search facility.

c. Facility shall also be provided to upload/store and retrieve data-sheets/ documents/ drawings/ audio files/ photographs/ videos marked or linked to a particular application or equipment which could then be accessed on different components of the solution.

v. Facility shall be available to print the information/data stored as part of knowledge repository.

vi. Messaging (SMS and E-Mail) - This functionality shall utilize SMS and Email Servers.

vii. Application Access over Internet: In order to enable accessibility of Desktop and Mobile application of DigiPAM solution over internet, provision has to be made available in the solution. Requisite hardware and software (such as web server, mobile app server) are to be supplied, installed and commissioned.

6. In the integrated solution, it shall also be possible to configure alerts/alarms based on some logic on the data available from various components or based on some permutation & combination on the alerts generated. Further, it shall be possible to assign priority to alerts based on the inherent criticality (type)

of the alert or based on the criticality of the equipment for which the alerts are being generated.

7. Mobility application (with compatible mobile apps) interface specific to all the applications in the scope of this tender (except viewing of 3d Model) shall also be required to be provided by the Bidder. Requisite hardware and software shall also be in the scope of the Bidder. For the areas outside plant boundary, access to mobile apps on Contractor supplied Rugged 4G Tablets shall be provided based on mobile networks (4G, etc.).

8. System shall be provided with a web based user interface making it possible to access the same from any of the systems in internal network. However, if web based user interface is not available with the solution then client software (non-web based) based access shall also be accepted for users accessing applications through PCs in IT Network and Laptops in Contractor supplied Wireless network in the plant. Client software shall not be exposed on internet.

9. The system should support to and fro transfer of data from other data sources and historians over open industry standard protocols like OPC (OPC UA, OPC DA, OPC HDA and OPC AE) and ModBus, through APIs, Database access, xmls.

10. 230V AC raw power supply point will be provided wherever available. Extending the same to the equipment supplied by the Contractor shall be in the scope of the Contractor. All servers, network components and other hardware (except IIOT sensors, wireless access points, switches etc. in the field) shall be UPS powered to be supplied by the Contractor.

11. System shall be required to comply to Security Policy and to Government/Regulatory guidelines for Cyber Security. Periodic security audit by a certified auditor (as per CERTIN panel) is to be arranged by the Contractor during SAT and every year during AMC period.

12. Contractor to upgrade all the software solutions in the during the AMC period to the latest software version available from the OEM of the software within the quoted lump sum price.

13. All hardware such as Server Racks, Network Components, UPS for powering loads and other accessories like PDBs, etc. to be considered in the offer.

14. Mode of submission of documents is online, no hardcopy required.

15. Language of the response should be English only else translated documents should be provided by Bidders

16. Warranty and AMC:

1 year Comprehensive on-site Warranty and 5 years Comprehensive on-site AMC for complete hardware and software shall also be in the scope of the Bidder. Comprehensive warranty of complete system (including communication interfaces) shall start from the date of successful completion of SAT (Site Acceptance Test) and Comprehensive on-site AMC of complete system (including communication interfaces) shall start from the date of successful completion of warranty period. Contractor shall depute adequate experienced personnel, during the warranty and AMC period to ensure 95% system availability. As per the terms of contract AMC payment shall be made on quarterly pro-rata basis.

17. Brief Description of EoI Process:

The interested Prospective partners shall ensure that their complete duly filled up response along with following annexures are received by BHEL on or before 27.07.2020.

Annexure 1- Pre-Qualification Requirement of EoI
Annexure 2- Pre-Qualification Requirement detailed information

The response shall necessarily be accompanied with details on following:

1. Organization Profile and Structure
2. Financial Statements
3. PQR details
4. Technical Details & System Description
5. Deviations
6. Relevant Experience Details and Client Certificates
7. Questionnaire
8. Additional information

In case any amendment/ corrigendum issued to this EoI, it shall be notified only at www.bhel.com

18. Schedule of EoI & Contact details:

18.1 Schedule of EoI:

The schedule of EoI shall be as follows:

S.No.	Description	Date
1.	Issue of EoI Document	01-07-2020
2.	Due Date for submission of EoI response	27.07.2020

18.2 Contact Details:

The respondent shall submit their offer with all annexures duly signed. Your response may be sent to the following address:

Name: Mr.Shaji.DR. DGM-PDG /Mrs.Poonguzhali.V, Dy.Mgr-PDG

Contact no : 080-26998743 /080-26989663

Email : shaji@bhel.in / poonguzhali@bhel.in

Address: 2nd Floor, COE Building, BHEL EDN, Mysore Road , Bangalore – 560026.

19. Miscellaneous:

19.1 Right to accept or reject any or all Applications:

a) Notwithstanding anything contained in this EoI, BHEL reserves the right to accept or reject any Application and to annul the EoI Process and reject all Applications, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons thereof. In the event that BHEL rejects or annuls all the Applications, it may, at its discretion, invite all eligible Prospective Collaborators to submit fresh applications.

b) BHEL reserves the right to disqualify any Applicant during or after completion of EoI process, if it is found there was a material misrepresentation by any such Applicant or the Applicant fails to provide, within the specified time, supplemental information sought by BHEL.

c) BHEL reserves the right to verify all statements, information and documents submitted by the Applicant in response to the EoI. Any such verification or lack of such verification by BHEL shall not relieve the Applicant of his obligations or liabilities hereunder nor will it affect any rights of BHEL.

19.2 Governing Laws & Jurisdiction:

The EoI process shall be governed by, and construed in accordance with, the laws of India and the Courts at New Delhi (India) shall have exclusive jurisdiction over all disputes arising under, pursuant to and / or in connection with the EoI process.

5. FORM OF APPLICATION

(To be submitted on Letter Head of organization)

Ref. No. Date:

DGM-PDG
COE Building 2nd Floor
BHEL EDN
Mysore Road
Bangalore-560026.

Dear sir,

Subject: Expression of Interest (EOI) for "identifying partners for supply, installation and commissioning of systems under Digitalised Plant Asset Management"

We, the undersigned express our interest for the subject EOI and declare the following:

(a) We are duly authorized to represent and act on behalf of ……. (name of the firm)

(b) We have examined and have no reservations to the EOI document including Amendment Nos. and Clarifications Nos. …… (if any).

(c) With reference to your invitation for EOI dated ……., we are furnishing herewith all the required details as per the prescribed Schedules (refer Annexure).

(d) We hereby express our willingness to participate in Request for Proposal (RFP) as and when BHEL invites the proposal for the same.

(e) BHEL and/or its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents and information submitted in connection with this application and to seek clarifications from our bankers and clients. This application will also serve as authorized on for any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and as requested by BHEL.

(f) BHEL and/or its authorized representatives may contact the following nodal persons for further information on any aspects of the application:

Name and Designation of Contact Person	**Address for Communication**	**Telephone No.**	**e-mail ID**

g) This application is made in the full understanding that:

1. Through this EOI, BHEL intends to only identify partners who have experience in "supply, installation and commissioning of systems under 'Digitalised Plant Asset Management' and is not intended for empanelment or pre-qualification of partner.

2. EOI process will be subject to verification of all information submitted at the discretion of BHEL.

3. BHEL reserves the right to reject or accept any or all applications, cancel the EOI process without any obligation to inform the applicant about grounds of the same.

h) The undersigned declare that the statements made and the information provided in the duly completed application are complete, true and correct in every detail.

Date: Signatures:

Place: Name:

Designation:

Company:

6. Schedule of Deviations

Deviations/ non-compliance with respect to EOI document may please be clearly brought out suitably in the following format:

Partner is expected to also provide details of the system feature which in an alternate way meets the intent of requirements mentioned in the brief scope.

S.N.	Reference to EOI document (Page No. & Clause No. etc.)	Specification Requirements	Statement of Deviation	Detailed reason for the deviation

Note: BHEL may not entertain deviations other than the above.

7. Additional Information from the bidder

Bidder is requested to study the complete scope of work for which he is participating in the EOI. In case, any equipment/service is required for completeness of the system but not mentioned in detail scope of the EOI, the same may be mentioned in the table below, for clarity:

Name of the Bidder:

Sl No	Component of Scope (RCM, AII, DW, AIM, IWN) for which bidder is responding to EOI	Equipment/Service not mentioned in the detail Scope section of EOI but required for completeness of the System

Annexure - 1
Pre-Qualification Requirement of EoI

1. The Prospective partner is required to substantiate this PQR by providing necessary information with supporting documents as documentary proof. Meeting qualification criteria for at least one of the item description listed below may participate in the EoI for the corresponding Item.
2. The prospective partner himself or his holding company (direct or indirect) or his subsidiary company (direct or indirect) or subsidiary company (direct or indirect) of holding company should meet the PQR.
3. In case, the propsepctive partner is OEM for one or more items but can provide solutions for other items through vendors, the same may also be detailed out in his offer.

S. No.	Description	Key Requirements	Prospective Partner Compliances (Yes/No)	Remark
	DigiPAM:			
1	Reliability Centric Maintenance (RCM):			
	Prospective partner with experience in RCM Software(s) implementation or OEM of RCM Software(s)	Route-1: 1.1.1 Prospective partner should be an OEM of RCM (Reliability Centric Maintenance) software(s) that shall be offered to BHEL and have got one (1) order for supply (licensing) of RCM (Reliability Centric Maintenance) software(s) to be implemented in a industrial setup. The referred RCM (Reliability Centric Maintenance) software(s) should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI. OR Route-2: 1.1.2 Prospective partner who should have got one (1) order for RCM (Reliability		Prospective partner is required to substantiate this PQR by providing necessary information with supporting documents as documentary proof.

		Centric Maintenance) implementation for a industrial setup. The referred RCM (Reliability Centric Maintenance) software(s) should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI.		
2	Application of IIoT in Industry (AII) :			
	Prospective partner with experience in AII implementation or OEM of AII	Route-1: 2.1.1 Prospective partner should be an OEM of data aggregation software(s) and wireless field sensors. The concerned partner should have got one (1) order for supply of wireless field sensors and license to aggregation software(s) for a industrial setup. The referred AII (Application of IoT in Industry solution software shall perform aggregation of data from various filed devices on a central server to be subjected to basic analytics and presentation to user on a graphical user interface. OR Route-2: 2.1.2 Prospective partner should have got one (1) order for AII (Application of IIoT in Industry) implementation for a industrial setup. The referred AII implementation order should include supply and implementation of industrial wireless network, wireless field sensors and aggregation of data from various field sensors on a central server to be subjected to basic analytics & Visualization and presentation to user on a graphical user interface.		Prospective partner is required to substantiate this PQR by providing necessary information with supporting documents as documentary proof.

3	Digital Worker(DW):			
	Prospective partner with experience in Digital Worker Software(s) implementation or OEM of Digital Worker Software(s)	Route-1: 3.1.1 Prospective partner should be an OEM of Digital Worker software(s) and should have got one (1) order for supply (licensing) of Digital Worker software(s) for a industrial setup. The Digital Worker software(s) should include providing apps for android and iOS based mobile devices. OR Route-2: 3.1.2 Prospective partner should have got one (1) order for Digital Worker software(s)implementation for a industrial setup. The system should include providing apps for android and iOS based mobile devices.		Prospective partner is required to substantiate this PQR by providing necessary information with supporting documents as documentary proof.
4	Asset Information Management (AIM):			

	Prospective partner with experience in 3D Modelling & Smart Documentation System Software/Solution implementation or OEM of 3D Modelling & Smart Documentation system Software/Solution	Route-1: 4.1.1 Prospective partner should be an OEM of 3D Modelling Software/Solution and have got one (1) order for supply (licensing) of 3D Modelling for a industrial setup. The referred 3D Modelling software/solution should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI. AND 4.1.2 Prospective partner should be an OEM of Smart Documentation System Software/Solution and have got one (1) order for supply (licensing) of Smart Documentation System solution for a industrial setup. The referred Smart Documentation System software/solution should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI. 4.1.3 In case the prospective partner does not meet the requirement either 4.1.1 or 4.1.2 above, the prospective partner can also qualify provided it collaborates/associates with an entity who meets those requirements of 4.1.1 or 4.1.2 above which prospective partner does not meet so that total requirement of Route-1 is met by the prospective partner with his associate partner.. OR Route-2: 4.2.1 Prospective partner should have got one (1) order for 3D Modelling (supply &		Prospective partner is required to substantiate this PQR by providing necessary information with supporting documents as documentary proof.

		installation) of a industrial setup. The referred 3D Modelling software/solution should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI. AND 4.2.2 Prospective partner should have got one (1) order (supply & installation) for Smart Documentation System solution for a industrial setup. The referred Smart Documentation System software/solution should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI. 4.2.3 In case the prospective partner does not meet the requirement either 4.2.1 or 4.2.2 above, the prospective partnercan also qualify provided it collaborates/associates with an entity who meets those requirements of 4.2.1 or 4.2.2 above which prospective partner does not meet so that total requirement of Route-2 is met by the prospective partner with his associate partner.		
5	Industrial Wireless Network(IWL):			
	Prospective partner with experience in Industrial Wireless Network implementation	5.1.1 Prospective partner should be an OEM of industrial wireless network and have experience in setup an industrial wireless private network that will provide connectivity to multiple services (inside the plant boundary and off-site areas) such as wireless IIOT sensors (data), digital worker mobile application (data, audio,video), digital helmet solution (data, audio, video), real time location tracking solution etc. Prospective partner should have got one (1)		Prospective partner is required to substantiate this PQR by providing necessary information with supporting documents as

		order for implementation of industrial wireless network solution for a industrial setup. The referred industrial wireless network solution should have been in successful operation in a industrial setup for a period of not less than one (1) year prior to date of publishing of BHEL's EOI.		documentary proof.

Industrial setup indicated above means power plant or process industries like cement plant, refinery, steel plant, coal mine, fertilizer plant etc.

Annexure - 2

A. PQR Detailed Information

S. No.	Description	Key Requirements	Remark
1	**The year the company was founded.**	Company details	Information
2	**Last 3 years financial information of company.**	Please provide last 3 years (a).TO, (b). balance Sheet (c). P/L statement and (d) net worth of company.	Information with Supporting documents
3	**Digitalized Plant Asset Management**		

3.1	**Reliability Centric Maintenance (RCM)** **A. RCM software** **B. RCM Implementation**	3.1.1. Number of plants where RCM Software including implementation of RCM functionalities and RCM/ FMEA Analysis for plant Assets successfully installed. 3.1.2. Name of client (end user) where RCM implimented with full Address, Fax No.,Telephone No. and E-mail address. 3.1.3 . The year the vendor entered its first commercial contract with any company for RCM. 3.1.4 . The number of customers currently and actively using the software in industry. 3.1.5. Is the RCM solution is cloud based or on-premise based or both? 3.1.6. Product Details (Name & Version/series/sub-module details as applicable) . 3.1.7 : Name of industry set up where RCM supplied and Installed in last three year. 3.1.8 : Date of start and completion and putting into operation for each set-up. 3.1.9 : Number of year for which RCM is in successful operation since putting into operation. 3.1.10 : Whether bidder is OEM of product OR with partnership. If it is from bidder partner, please provide detail of partner. 3.1.11. Name of the referred industrial setup (Location and Address). 3.1.12 . Name of Package/Contract along with Order/LOA No. & Date. 3.1.13. Rating of the largest one unit of power plant / Industry where the software has used for monitoring. 3.1.14 Name of Systems / equipment of plants captured by the system .	Information with Supporting documents

3.2	**Application of IIoT in Industry (AII)** **A.IIoT in Industry (AII) Software** **B. Implementation of IIoT in Industry (AII)**	3.2.1. Number of plants where AII Software including implementation of AII functionalities successfully installed. 3.2.2. Name of client (end user) where AII implimented with full Address, Fax No.,Telephone No. and E-mail address. 3.2.3 . The year the vendor entered its first commercial contract with any company for AII 3.2.4 . The number of customers currently and actively using the software 3.2.5. Is the AIi solution is cloud based or on-premise based or both?1. Product Details (Name & Version/series/sub-module details as applicable) Please attach relevant documents 3.2.6. Are the following type of IIoT devices available with you or through your sub-vendors: (i) Non Intrusive Wireless Sensors & Transmitters for Vibration Measurement (ii) Non Intrusive Wireless Sensors & Transmitters for Vibration Measurement (Displacement Type) (iii) Non Intrusive Wireless Sensors & Transmitters for Temperature Measurement (iv) Hydrogen Leak Detection Wireless Sensors & Transmitters (v) Partial Discharge Monitoring Wireless Sensor & Transmitter (vi) Lux Level Measurement Wireless Sensor & Transmitter (vii) Level Measurement Wireless Sensor & Transmitter (viii) Pressure Wireless Sensors & Transmitter (ix) Air Flow Wireless Sensor & Transmitter (x) Humidity Wireless Measurement Sensor & Transmitter (xi) Wind Speed Wireless Measurement Sensor & Transmitter (xii) Humidity Measurement Wireless Sensor &	Information with Supporting documents

		Transmitter (xiii) Chlorine Concentration Measurement Wireless Sensor & Transmitter (xiv)AC Voltage Measurment Wireless Sensors & Transmitters including suitable potential transformer, Portable DC Voltage Measurment Wireless Sensors & Transmitters (0−50V DC) Portable DC Current Measurment Wireless Sensors & Transmitter including dismountable current	

3.3	**Digital Worker Solution** **A. Digital Worker Software** **B. Implementation of Digital Worker.** **Brief system description:** **Digital Worker:Mobile Apps for use in field for use cases as per requirement for example Operator Rounds** **Digital Helmet (including the Hardware of Realwear make and configuration/development of features as required)** **RTLS (Real Time Location Tracking System)**	3.3.1. Number of plants where Digital worker Software including implementation of AII functionalities successfully installed. 3.3.2. Name of client (end user) where Digital worker Software implimented with full Address, Fax No.,Telephone No. and E-mail address. 3.3.3 . The year the vendor entered its first commercial contract with any company for Digital worker Software 3.3.4 . The number of customers currently and actively using the software. 3.3.5. Is the Digital worker Software solution is cloud based or on-premise based or both?1. Product Details (Name & Version/series/sub-module details as applicable) Please attach relevant documents a. Mobility Applications for applications like Operator Rounds b. Realwear based Digital Helmet /Connected Digital Worker-Skill Center c. Real time location tracking system (RTLS)	Information with Supporting documents

3.4	**Asset Information Management (AIM):** **A. Creation of Intelligent 3D modelling** **B. Creation of Intelligent P&ID** **C. Digitalization of plant documents and drawings and interlinking of 3D models with documents, intelligent P&IDs, 2D drawings, documents etc.**	3.4.1. Number of plants where AIM including implementation of AIM functionalities successfully installed. 3.4.2. Name of client (end user) where AIM implimented with full Address, Fax No.,Telephone No. and E-mail address. 3.4.3 . The year the vendor entered its first commercial contract with any company for AIM 3.4.4 . The number of customers currently and actively using the software. 3.5.5. Is the AIM solution is cloud based or on-premise based or both?1. Product Details (Name & Version/series/sub-module details as applicable) Please attach relevant documents 3.5.6 3D Modelling 1. Product Details (Name & Version/series/sub-module details as applicable) 2. Please mention 3D modelling technology that shall be used in such a system 3. Will it be possible to interlink 3D model developed here with the intelligent P&IDs and 2-D drawings in a document management system. If yes, then please mention the name of all such document management system which can be interfaced with mentioned 3D modelling software. 4. Can 2-D drawings be generated from the built 3-D model? Digitization of Plant documents and drawings including creation of Intelligent P&IDs Will it be possible to interlink intelligent P&IDs and digitized 2D documents in the mentioned system to be linked to a 3D modelling software. If yes, then please mention the name of all such 3D modelling software which can be interfaced with mentioned document management system software 5.1. Whether scanning will be used for capturing	Information with Supporting documents

		upto date as-is/ as-built physical plant for creating 3D models? If yes, then name the scanning technologies and software that will be used. 5.2 Whether scanning work will be done by the bidder or the services will be outsourced from other party. In case scanning work is outsourced to other party, mention the name and work division with the party. 6. Whether Smart documentation tool will be on the same software platform of 3D modelling & Intelligent P&ID or will it use independent platform with linkage to 3D models and Intelligent P&IDs		

3.5	**Wireless Infrastructure for providing field connectivity on the above solutionsA. Wireless Infrastructure solutionB. Implementation of Wireless Infrastructure solution**	3.5.1. Number of plants where Wireless Infrastructure solution including implementation of Wireless Infrastructure solution functionalities successfully installed. 3.5.2. Name of client (end user) where Wireless Infrastructure solution implimented with full Address, Fax No.,Telephone No. and E-mail address. 3.5.3 . The year the vendor entered its first commercial contract with anycompany for Wireless Infrastructure solution 3.5.4 . The number of customers currently and actively using the software. 3.5.5. Is the Wireless Infrastructure solution solution is cloud based or on-premise based or both 1. Product Details (Name & Version/series/sub-module details as applicable) Please attach relevant documents	Information with Supporting documents
3.6	**Integration of all system mentioned in 3.1 to 3.5 on common platform.**	3.6.1 : Name of software platform to integrate the system from 3.1 through 3.5. 3.6.2 : capacity of software platform to integrate multiple units and plants. 3.6.3: API should be made available for third party system	Information with supporting documents.
4	Partnership with BHEL	Is your company willing to become partner with BHEL to participate in DigiPAM (Dititalized Plant Asset Management) Package (having all of the components for individual system or for total as mentioned above)	Willingness and expected mode of partnership

5	**Organisation Structure of the company for Digitalized Plant Asset Management (DigiPAM) project. If implementation is through an associate / partner, the above details of partner shall also be furnished.**	1. Registered Office address 2. Brief detail about company and other businesses	organization chart & Information as asked
6	**Total number of service center / units of company in India with name and address .**		Information with Supporting documents
7	**Any addition information from bidder**		Information
8	**Contact Details with** **name :** **designation :** **mobile number :** **land line number :** **e-mail :**		Information

B. Solution Matrix

S. No.	Description	Prospective Partner offer for Software part	Prospective Partner offer for Hardware part	Prospective Partner offer for Implementation part	Prospective Partner offer for Warranty	Prospective Partner offer for AMC
3.1	**Reliability Centric Maintenance (RCM)** **A. RCM software** **B. RCM Implementation**					
3.2	**Application of IIoT in Industry (AII) & Digital Worker** **A.IIoT in Industry (AII) Software** **B. Implementation of IIoT in Industry (AII)**					
3.3	**Digital Worker Solution** **A. Digital Worker Software** **B. Implementation of Digital Worker.** **Brief system description:** **Digital Worker:Mobile Apps for use in field for use cases as per requirement for example Operator Rounds** **Digital Helmet (including the Hardware of Realwear make and configuration/development of features as required)** **RTLS (Real Time Location Tracking System)**					

3.4	**Asset Information Management (AIM):** **A. Creation of Intelligent 3D modelling** **B. Creation of Intelligent P&ID** **C. Digitalization of plant documents and drawings and interlinking of 3D models with documents, intelligent P&IDs, 2D drawings, documents etc.**					
3.5	**Wireless Infrastructure for providing field connectivity on the above solutions** **A. Wireless Infrastructure solution** **B. Implementation of Wireless Infrastructure solution**					
3.6	**Integration of all system mentioned in 3.1 to 3.5 on common platform.**					

DISCLAIMER

The information contained in this Expression of Interest document or subsequently provided to Applicant(s), whether verbally or in documentary or any other form, by or on behalf of BHEL, is provided on the terms and conditions set out in this EOI and such other terms and conditions subject to which such information is provided.

The purpose of this EOI is to provide interested parties with information that may be useful to them in the formulation of their application for qualification and subsequent selection pursuant to this EOI. This EOI is neither intended nor shall it be construed as creating or requiring any ongoing or continuing relationship or commitment with any party or person. This is not an offer or invitation by BHEL to the prospective Applicant(s) or any other person to enter into an agreement of any kind with any party.

Though adequate care has been taken in the preparation of this EOI document, the Interested Firms / Agencies are required to make their own enquiries and assumptions wherever required, to satisfy themselves that the document is complete in all respects. The information is not intended to be exhaustive. Intimation of discrepancy, if any, should be given to the specified office immediately. If no intimation is received by this office by the date mentioned in the document, it shall be deemed that the EOI document is complete in all respects and firms submitting their interest are satisfied with the ~~EOI~~ document in all respects.

The issue of this EOI does not imply that BHEL is bound to select and shortlist Applicant(s) for next stage or to enter into any agreement(s) with any Applicant(s). BHEL reserves all rights to withhold or withdraw the process, reject any applications submitted in response to this EOI document at any stage without assigning any reasons thereof. Neither BHEL nor its employees and associates will have any liability any loss, expense or damage which may arise from or be incurred or suffered in connection with anything contained in this EOI document or any matter deemed to form part of this EOI document, the information and any other information supplied by or on behalf of BHEL.

The Applicant shall bear all its costs associated with or relating to the preparation and submission of its Application including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by BHEL or any other costs incurred in connection with or relating to its Application. All such costs and expenses will remain with the Applicant and BHEL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Applicant in preparation or submission of the Application, regardless of the conduct or outcome of the EOI.