

3X360MW NORTH KARANPURA TPS

TECHNICAL SPECIFICATION

FOR

**PLANT DESIGN SOFTWARE,
HARDWARE AND
SERVICES**

SPECIFICATION No: PE-TS -405-100-H 001(Rev.01)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT DIVISION
NOIDA, INDIA**

	Technical specification for Plant Design Software, Hardware and Services 3X360MW NORTH KARANPURA	SPECIFICATION NO.	PE-TS -405-100-H 001(R01)
		DATE	24 FEB 2020

SCOPE OF ENQUIRY

1. SCOPE

- 1.1. This specification covers supply and installation of Hardware and Software Licenses, Annual Maintenance (for 3 years after warranty) of software, training on software at customer(NTPC) premises as detailed in subsequent parts of the specification.

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SPECIFIC TECHNICAL REQUIREMENTS

A. Current 3D Modelling environment in BHEL for North Karanpura

BHEL has carried out plant design using various 3D Modelling platform available across its various units and divisions. For this project, BHEL-PEM has used Smart Plant 3D (SP3D) for Modelling of areas like Turbine Generator(TG) Hall and a few Balance of Plant (BoP) packages. Certain constituents of TG hall model are modelled by other sister units as per scope, in PDMS. Boiler, Coal Handling Plant, Fire Fighting System are modelled by respective units in PDMS. Some vendors of BHEL have also used AutoCAD based platforms for 3D Modelling. PEM has imported in SP3D environment the heterogeneous models of other BHEL units and vendors, to compile a project model. These imported models are read-only and provide integrated walkthrough, clash check and other facilities available with a non-editable reference model as per the capability of SP3D environment. BHEL will supply above created 3D Model to NTPC after completion of the project along with 3D Review model of BoPs and boiler of North Karanpura Plant. The review files are extracted from SmartPlant 3D in Smart Plant Review format (.vue file).

B. REQUIREMENT

- Supply, installation and demonstration of Perpetual license of 3D Modelling software (with 3 years AMC after warranty). Bidder must take into account the existing 3D Model of TG Hall in BHEL for supplying the Hardware and Software (as per A above in specific technical requirements). 3D model of TG Hall of the North Karanpura project, prepared by BHEL, consists of PDMS and SP3D models. Customized 3D symbols are also present. Offered 3D Modelling software must be able to open this 3D Model.
- Supply, installation and demonstration of Perpetual license of 3D Model Review software (with 3 years AMC after warranty). 3D model of BoP and Boiler of the North Karanpura project, prepared by BHEL, has various other 3D formats like SP3D, PDMS and AutoCAD. Offered 3D Model Review software must be able to open the review model extracted from this 3D Model.
- Supply installation and testing of Hardware (Servers and workstations) with best configuration required by offered 3D Modelling software & 3D Model Review Software.
- Offered servers and workstations must be loaded with appropriate Operating system compatible with both 3D Modelling software & 3D Model Review Software. Minimum specification for hardware is provided in the end of this section.

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- Bidder to supply all accompanying software (to 3D Modelling software & 3D Model Review software) e.g. RDBMS, which are essential for opening & viewing 3D Model & 3D Review model prepared at BHEL as mentioned in cl. **A** above. This software must be loaded on both workstations.
- Installation and configuration of all hardware & software is in Bidder's scope. Warranty period of one year will start only after SAT completion. All hardware and software will include warranty.
- The criteria of successful completion of installation and demonstration will be as follows:
 - a) The successful demonstration at NTPC EOC, Noida that the Offered software are able to open & view (with desired features mentioned in spec) 3D Model of TG Hall & 3D Review model of BoP and Boiler prepared by BHEL (for North Karanpura).

C. HARDWARE SPECIFICATIONS: ¹

SPECIFICATION:COLOR LASER PRINTER A3 SIZE		
1	Print Speed	25 ppm (A4, normal) & 12 ppm (A3, normal) or higher.
2	Connectivity	Ethernet LAN, USB
3	Print resolution	600X600 dpi or higher
4	Duplex printing	Required, Automatic
5	Media Size	A3, A4, A5, letter, executive, legal
	Media Type	Paper (plain, pre-printed, letterhead, pre-punched, bond, colour, card stock, rough, recycled), envelopes, transparencies, labels
6	Paper Trays	3 Trays or more - including one A4,one A3 and one Multipurpose Tray
7	RAM	128MB or higher
8	Duty cycle	75,000 pages per month or higher
	Cartridge technology	Integrated drum and tonner or Separate Drum & Toner
9	Print Language Support	PCL 5e, PCL 5c, PCL6, PostScript3/ PostScript3 Emulation
10	OS Compatibility	Should be fully compatible with OS Offered with Server and Workstations
11	Compliance	Energy Star compliant
12	Management	Should be remotely manageable through web browser
13	Warranty	OEM warranty (labour, parts, onsite) for one year

¹ : Hardware specifications provided are minimum. Bidder to supply best suited hardware required by offered 3D Modelling software for smooth working and also furnish their specifications along with the bid.

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WORKSTATION SPECIFICATION

S.No.	Parameter	Detailed Specification
1	Processor	x86 Multicore processors at 3.5GHz or higher with SPEC CPU Rate 2006 of 210 or higher (60% of SPEC Int Rate base2006 plus 40% of SPEC fp Rate base2006 scores - tested with 32GB RAM) with 8MB Cache or higher. The quoted processor should be from latest available reliable series released in the year 2015 or later. Supporting documents for the processor specification and benchmark details to be enclosed.
2	Chipset & Motherboard	Matching Workstation Class Chipset & Motherboard for the quoted Processor
3	RAM	2x16 GB DDR4 RDIMM Memory, 2133 MHz, ECC expandable to 64 GB with 4 dimm slots or more
4	HDD	2 TB 7.2 K RPM SATA Hard Drive with SMART (Self-Monitoring, Analysis and Reporting Technology) feature or more
5	Optical Drive	8X or more OEM DVD +/- R/W SATA Drive
6	Graphics Card	Professional Graphics Card 3D (NVIDIA Quadro or AMD Firepro) with 2 GB DDR3/DDR5 Memory and PCI Gen 3 compatible
7	Monitor	OEM make 21" 4:3 / 5:4 aspect ratio, minimum resolution 1600 x 1200, TCO 3/5 & Energy Star compliant or better
8	Keyboard	OEM Keyboard with 104 key
9	Mouse	OEM 2/3 button USB optical mouse
10	Audio	Integrated Audio with Internal speakers
11	Ethernet	Integrated (on-board) 100/1000Mbps RJ45 port with WOL, PXE (or equivalent), ASF (Alert Standard Format) OS independent software to monitor & analyse network connection.
12	PCI Slots	Min. 4 (PCI Express and PCI Express x16) Slots
13	Ports	Minimum 8USB ports with 2 nos. USB (3.0), VGA/DVI, HDMI / Display Port, Speaker, Microphone and Headphone. If VGA not available then HDMI/DP to VGA convertor to be supplied
14	Software ²	Windows 10 Professional 64 bit with latest service pack, Restore / Recovery CD & with OS media CD with each PC (in absence of OS Media CD OEM pack of OS to be supplied), a software to provide data recovery to restore user data, settings, applications and Operating System in the event of a software crash or virus infection. The latest system drivers should be available on OEM's website. Should be able to support Red Hat Linux also.

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WORKSTATION SPECIFICATION

15	Diagnostic Tool / Software	Diagnostic tool for hardware diagnostics
16	Security	Removable media boot control, USB Interface Control, Power-On Password, Setup Password, should give alert on management console and desktop on tampering the system. Should come with integrated Trusted Platform Module (TPM) 1.2 Security Chip. Chassis with Locking feature.
17	Certifications (For whole workstation)	OS Certification from Microsoft Certified for Autodesk products Certified for 3D Plant Design Software ERTL / FCC - EMC class B Latest version of IEC-60950-1 / IS 13252 / UL-60950 Energy Star 5.0 compliant or better RoHS compliant
18	Warranty	OEM warranty (labour, parts, on-site) for one year

SERVER SPECIFICATION

S.No.	Parameter	Detailed Specification
1	Processor	x86 Multicore processors at 3.0 GHz or higher with SPEC CPU Rate 2006 of 650 or higher (60% of SPEC Int Rate base2006 plus 40% of SPEC fp Rate base2006 scores - tested with 64GB RAM) with 20MB Cache or higher. The quoted processor should be from latest available reliable series released in the year 2016 or later. Supporting documents for the processor specification and benchmark details to be enclosed
2	Chipset & Motherboard	Matching Workstation Class Chipset & Motherboard for the quoted Processor
3	RAM	2X32 GB or 4x16 GB DDR4 RDIMM Memory, 2133MHz, ECC upgradeable to 128 GB
4	HDD	Mini 2x 900GB 10000 RPM SAS Hard Drive (RAID1)
5	Optical Drive	8X or more OEM DVD +/- R/W SATA Drive
6	Graphics Card	Professional Graphics Card 3D (NVIDIA Quadro or AMD Firepro) with 4 GB DDR5 Memory and PCI Gen 3 compatible
7	Monitor	OEM make 21" 4:3 / 5:4 aspect ratio, minimum resolution 1600 x 1200, TCO 3/5 & Energy Star compliant or better
8	Keyboard	OEM Keyboard with 104 key
9	Mouse	OEM 2/3 button USB optical mouse

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SERVER SPECIFICATION		
10	Audio	Integrated Audio with Internal speakers
11	Ethernet	Integrated 100/1000 Mbps RJ45 port with WOL
12	Bays/ Slots	Minimum 4 bays, 5 (PCI Express and PCI Express x16) Slots
13	Ports	8 USB ports with minimum 2 USB (3.0), VGA/DVi, HDMI / DisplayPort, Speaker, Microphone and Headphone. If VGA not available then HDMI/DP to VGA convertor to be supplied
14	Software ²	Windows 10 Professional 64 bit with latest service pack, Restore / Recovery CD & with OS media CD with each PC (in absence of OS Media CD OEM pack of OS to be supplied), a software to provide data recovery to restore user data, settings, applications and Operating System in the event of a software crash or virus infection. The latest system drivers should be available on OEM's website. Should be able to support Red Hat Linux also.
15	Diagnostic Tool / Software	Diagnostic tool for hardware diagnostics
16	Security	Removable media boot control, USB Interface Control, Power-On Password, Setup Password, should give alert on management console and desktop on tampering the system. Should come with integrated Trusted Platform Module (TPM)1.2 Security Chip. Chassis with Locking feature.
17	Certifications (For whole workstation)	OS Certification from Microsoft Certified for Autodesk products Certified for 3D Plant Design Software Latest version of IEC-60950-1 / IS 13252 / UL-60950 Energy Star 5.0 compliant or better RoHS compliant
18	Warranty	OEM warranty (labour, parts, on-site) for one year

²: OS information provided here is general in nature. Bidder to ensure compatibility of Offered OS with Offered 3D Modelling software & 3D Model Review software

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D. SOFTWARE SPECIFICATIONS:

SPECIFICATION: 3D Model Review Software	
S.No.	REQUIRED FEATURES
1	Network ready
2	Shall include interference check
3	Walk through animation
4	Simulation for equipment placement and removal
5	Visual effect
6	Photo realism
7	The Offered 3D Model Review Software must be capable of opening Review file created from SmartPlant 3D software (.vue file)
8	The software shall include the facility for obtaining hardcopies of all the documents/drawings on standard plotter/printer
9	One year warranty and 3 Years AMC after warranty

SPECIFICATION: 3D Modelling Software	
S.No.	REQUIRED FEATURES
1	Offered 3D Modelling software must be able to open the 3D Model prepared by BHEL (as per Cl. A of Specific technical requirements) with essential properties of 3D objects like type, dimensions, material, process parameters etc.
2	One year warranty and 3 Years AMC after warranty

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BILL OF QUANTITY

Sr. No.	Item Name	Measuring Unit	Qty.
A	B	C	D
1	Perpetual license of 3D Modelling Software for use on all the machines	No.	2
	All accompanying software e.g., RDBMS etc., essential for opening & viewing the 3D Model prepared by BHEL using the offered 3D Modelling software	No.	As required*
2	Annual Maintenance Contract (AMC) which shall include software upgrades as and when released by the software agency for a period of three (3) years after warranty/guarantee period for 2 licenses of 3D Modelling Software	Years	3
3	Perpetual license of 3D Model Review Software for use on all the machines (including accompanying software)	No.	2
4	Annual Maintenance Contract (AMC) which shall include software upgrades as and when released by the software agency for a period of three (3) years after warranty/guarantee period for 2 licenses of 3D Model Review Software	Years	3
5	Training for working on Offered 3D Modelling software and 3D Review Software, NTPC Engineering Office Complex (EOC) at Noida as per mutually agreed schedule	Man Days	100
6	Server class machine #	No.	1
7	Workstations #	No.	2
8	LaserJet Printer - A3 Color	No.	1

Server and workstations must be loaded with appropriate Operating system compatible with Offered 3D Modelling software & 3D Model Review Software. Minimum specification for hardware is mentioned in specific technical requirements section. All requisite hardware and software shall be offered and commissioned by the bidder at NTPC Engineering Office Complex (EOC), Noida. Both offered Workstations must be loaded with accompanying software mentioned at Sl. No. 6 above.

* Bidder to quote essential quantities of any software required for working of 3D Modeling software. Installation, testing and demonstration of all offered hardware & software is in Bidder's scope.

 PRICE SCHEDULE (Technical specification for Plant Design Software, Hardware and Services for 3X660 MW NORTH KARPURA STPP)								SPECIFICATION NO.	PE-TS -405-100-H 001(R01)
								DATE	24-Feb-20
Sr.No.	Item Name	HSN/SAC	Unit of measurement	Qty	Unit Outright Cost(INR)	Total Cost (without Tax)	GST for 1 Lic	Total Tax	Total Cost for xx No. of licenses
A	B	N	C	D	E	F = E*D	I	J = I*D	M = F+J
1	Perpetual license of 3D Modelling Software for use on all the machines	85238020	No.	2					
	All accompanying software e.g., RDBMS etc., essential for opening & viewing the 3D Model prepared by BHEL using the offered 3D Modelling software (Bidder to quote essential quantities of any software required for working of 3D Modeling software)	85238020	No.	As required*					
	Total								0.00
3	Annual Maintenance Contract (AMC) which shall include software upgrades as and when released by the software agency for a period of three (3) years after warranty/guarantee period for 2 licenses of 3D Modelling Software (including accompanying software)	9973	Years	3					
4	Perpetual license of 3D Model Review Software for use on all the machines with all accompanying software essential for opening & viewing 3D review Model prepared by BHEL (as per Cl. B of specific technical requirements)	85238020	No.	2					
5	Annual Maintenance Contract (AMC) which shall include software upgrades as and when released by the software agency for a period of three (3) years after warranty/guarantee period for 2 licenses of 3D Model Review Software (including accompanying software)	9973	Years	3					
6	Training for working on Offered 3D Modelling software and 3D Review Software, NTPC Engineering Office Complex (EOC) at Noida as per mutually agreed schedule	999293	Man Days	100					
7	Server class machine	8471	No.	1					
8	Workstations	8471	No.	2					
9	Laserjet Printer - A3 Color	8443	No.	1					

NOTE :- Bidder to write "Quoted" against each offered item in Unpriced Price Schedule and submit with Technical offer.

* Bidder to quote essential quantities of any software required for working of 3D Modeling software.

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SCHEDULE OF DESPATCH, INSTALLATION, FAT AND TRAINING

1.	Zero Date	Date of LOI / FOI / TOI
2.	Dispatch (Packaging & Dispatch) as per spec	08 Weeks from the Zero date
3.	Installation of software and hardware at NTPC premises as per spec	12 Weeks from the Zero date
4.	SAT-Site Acceptance Test (Clearance after Demo at NTPC office)	18 Weeks from the Zero date
5.	Training (Training to be provided only after SAT)	24 Weeks from the Zero date

NOTE: BIDDER TO COMPLY WITH THE REQUIREMENT OF DELIVERY SCHEDULE, BOQ & PQR

(Signature and Stamp of the Bidder)

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CHECKLIST

S.No.	SPECIFICATION REQUIREMENT	BIDDER RESPONSE (YES/NO)
1	Offered 3D Modelling software is capable of opening & viewing the existing Plant 3D model in BHEL which is made partly in SP3D and partly in PDMS (Pl. refer clause “A” of specific technical requirements section)	
2	Offered 3D Model Review software is capable of opening & viewing Review file created from SmartPlant 3D software (.vue format) and offered 3D Model Review software has all features as mentioned in specific technical requirements	
3	Offered Hardware (servers, workstations and printers) meets specification and configuration for compatibility as required by Offered 3D Modelling software (in terms of graphics, processing speed, memory, storage etc.)	
4	Offered Operating System for servers, workstations and printers is compatible with Offered 3D Modelling software and 3D Model Review software	
5	Prices and unit prices of offered Perpetual license of 3D Modelling software and 3D Review software have been quoted in price schedule	
6	Price(s) and unit prices of all accompanying software (to 3D Modelling software & Review Software), required for opening & viewing 3D Model & 3D Review model prepared by BHEL (pl. refer cl. “A” of specific technical requirements) have been quoted in price schedule.	

IMPORTANT NOTE:

BIDDERS MUST CAREFULLY READ THE CHECKLIST AND PROVIDE FILLED-IN CHECKLIST WITH THEIR OFFER. OFFERS WITHOUT FILLED-IN CHECKLIST WILL NOT BE CONSIDERED FOR EVALUATION.

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IMPORTANT NOTES FOR BIDDER:

1. Following duly filled-in formats to be signed, stamped with company seal and submitted by the bidders with technical offer
 - a. Schedule of submission of dispatch, installation, SAT and training
 - b. "Quoted" entered for each offered item in Un-Priced price schedule
 - c. Check List
 - d. Documents supporting PQR compliance

TERMS OF PAYMENT:

1. Payment shall be released after successful demonstration of offered software on the supplied hardware at NTPC office, NOIDA.
2. Payment of AMC shall be made on Quarterly basis.