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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. TECHNICAL SPECIFICATION FOR FIRE DETECTION AND PROTECTION SYSTEM OF FDG PACKAGE. PROJECT : NCTPP (2 x 490 MW) DADRI STAGE-II(FGD SYSTEM PACKAGE) CUSTOMER : NTPC LIMITED										
					Revisions :		Prepared by:	Checked by:	Approved By:	Date
							-SD-	-SD-	-SD-	
					00		AVIRAL/RAVI	AMIT KUMAR	SEKHAR PC	21/05/2018

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	14.1.	CHECK LIST	Annexure – 1 (total sheets – 01)
	14.2.	TECHNICAL DATA SHEETS FOR WBFPS ITEMS	Annexure – 2 (total sheets – 26)
	14.3.	BOQ OF WATER BASED FIRE PROTECTION SYSTEM	Annexure – 3 (total sheets – 12)
	14.4.	BOQ OF FIRE DETECTION & ALARM SYSTEM	Annexure – 4 (total sheets – 4)
	14.5.	BOQ OF PORTABLE FIRE EXTINGUISHERS	Annexure – 5 (total sheets – 1)
	14.6.	LIST OF SPECIAL TOOLS & TACKLES	Annexure – 6 (total sheets – 2)
	14.7.	PRICE BID FORMAT	Annexure – 7 (total sheets – 13)
	14.8.	SUB – VENDOR LIST	Annexure – 8 (total sheets – 6)
	14.9.	QUALITY PLANS	Annexure – 9 (total sheets –3)
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	14.11.	FDA SCHEME	Annexure – 11 (total sheets –1)
	14.12.	PANEL WISE BOQ	Annexure – 12 (total sheets –10)
	14.13.	NTPC SPECIFICATION	Annexure – 13 (total sheets –18)
	14.14.	PLOT PLAN	Annexure – 14 (total sheets –1)
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	14.16.	PACKING PHILOSOPHY FOR SPARES	Annexure – 16 (total sheets –6)
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		<u>IMPORTANT INSTRUCTION TO BIDDER</u> DOCUMENTS TO BE SUBMITTED WITH THE BID TO ENABLE BHEL TO EVALUATE THEIR OFFER TECHNO COMMERCIALY. The bidder must submit the following documents along with their bid. a) Un-priced copy of price bid format indicating quoted/ not quoted against each line item. b) Signed copy of the Technical Specification. c) Filled-in Checklist. (Annexure-01) d) No Deviation certificate/Confirmation		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		1. INTENT OF SPECIFICATION 1.1. This technical specification covers the Design, Engineering, Manufacturing, System integration, Assembly, painting, testing at vendor works, inspection by purchaser/NTPC, packing and transportation to site with necessary documentation like data sheets, statutory approvals, O&M manuals etc., as required and supervision of Erection, Commissioning till final handover of Fire Detection & Protection systems to End user. 1.2. This is a lump sum fixed price contract. Bidder must furnish the quotation as per this technical specification and ensure their quotation meets the intent of the specification. 1.3. It is not possible to completely specify all details of design, manufacture and construction of each and every component and system. However, the intent is that the equipment and supply shall confirm to high standard of engineering and best practices of fire protection industry. The supplied equipment & systems shall be capable of performing in continuous commercial operation in a manner acceptable to the Purchaser and end customer (NTPC). 2. INSTRUCTIONS TO BIDDERS 2.1. Bidders are advised to contact BHEL for any technical queries in writing <u>within one week of issue of this Enquiry</u>. In the event of any conflict within the specification, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications before bid submission. The discrepancies/queries raised after pre-bid stage or during order execution stage, it shall be binding on the bidder to comply with the final decision made by the BHEL without any techno-commercial implications. 2.2. Offers with incomplete information will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder. 2.3. Any technical features (over & above BHEL enquiry specification requirements) proposed by Bidder will not be given preference for the purpose of evaluation. 2.4. Bidder to refer to the Special Conditions of the contract (SCC) & General Conditions of the Contract (GCC) of tender specifications. 2.5. Bidder shall submit the “Duly filled & Signed copy of Check list” (Annexure – 01) compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder.		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		3. PROJECT DESCRIPTION 3.1. Site is located in the existing NTPC Dadri Plant, which comes under Gautam Budh Nagar District of Uttar Pradesh. The nearest railway station is Dadri at a distance of 8.5 km. 3.2. The nearest airport is at 70 Kms which is Delhi airport. Nearest connecting highways are NH-3 and NH-24. 4. BIDDER'S SCOPE OF SUPPLY 4.1. Water Based Fire Protection System (WBFPS) equipment – Refer Annexure – 03 for BOQ. 4.2. Fire detection & Alarm (FDA) System equipment – Refer Annexure – 04 for BOQ. The layout engineering of FDA system, i.e. the fire detector's layout, MCP layout & others, is carried out by BHEL. The bidder to carry out the fire alarm panel engineering, repeater panel engineering, networking and their loop configuration as per the BOQ of Annexure-4, 12 and plant layout Annexure-14. The additional input data, if any, required to carry out fire alarm panel engineering, repeater panel engineering, networking and their loop configuration shall be specifically requested by the bidder. 4.3. Portable Fire Extinguishers – Refer Annexure – 05 for BOQ 4.4. Special Tools & Tackles – Refer Annexure – 06 for BOQ 4.5. O&M spares for 10 years operation – refer Annexure – 3 & 4 4.6. Commissioning Spares – refer Annexure – 3 5. BIDDER'S SCOPE OF SERVICES 5.1. Supervision of erection & commissioning, testing & trial run at site till final handing over to end customer for the supplied systems/items. 5.2. Number of man days and number of visits as specified in the Annexure - 07 of this specification shall be considered. However, either or both number of man days and/or number of visits may increase / decrease based on the actual site requirement.		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		5.3. Bidder to mobilize concerned competent person for supervision of Erection & commissioning activities within a period of 7 days of receipt of intimation in this regard from BHEL. 5.4. Following shall be the scope of work for services:- - Services charges shall include the travel to & fro travel from vendors work to site, lodging, boarding & local travel. Vendors shall arrange their own lodging, boarding & traveling. - Vendors shall arrange their own Test equipment's, commissioning tool, skilled manpower etc. as required. 5.5. Above services shall be ordered by BHEL Site at the time of commissioning. However, vendor shall submit the price offer for services as per Annexure - 07 of this specification and same shall be considered for L1 evaluation. 5.6. The system engineering & loop configuration of FDA system shall be carried out by bidder as described in respective clauses. The layout engineering of FDA system, i.e. the fire detector's layout, MCP layout & others, is carried out by BHEL. The bidder to carry out the system engineering / loop configuration as per the BOQ of Annexure-4 and plant layout Annexure-14. The input data, if any, required to carry out FDA system engineering & loop configuration shall be specifically requested by the bidder. 5.7. All the FDA panels and FDA loops shall be commissioned and demonstrated at site by bidder / OEM of FDA system. 6. EXCLUSIONS 6.1. Storage, preservation of Materials/Equipment at site (however detailed storage and preservation procedure, as applicable, shall be furnished by bidder) 6.2. Erection works 6.3. Civil works 7. APPLICABLE CODES & STANDARDS 7.1. Water Based Fire Protection System – Refer Annexure - 02 7.2. Fire Detection & Alarm System - Tariff Advisory Committee (TAC), - International Standards such as British, USA, VDE - Loss Prevention Certification Board (LPCB), - Indian Electricity (Supply) Act (IEA)		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		e) IS 2189 (Selection, Installation and Maintenance of Automatic Fire Detection and Alarm System-Code of Practice). f) Any other equivalent internationally recognized body acceptable to BHEL/End customer. 7.3. Portable Fire Extinguishers a) IS 15683 (Portable Fire Extinguishers--Performance and Construction--Specification) Latest edition of applicable codes/Standards/Statutory Regulations shall be followed. 8. GENERAL TECHNICAL REQUIREMENTS 8.1. For technical details refer datasheets of components of water based fire protection system, (Annexure – 02.) 8.2. The specification Fire detection & protection system given by end user (NTPC) is given in Annexure – 13. Bidder shall refer to this annexure for technical details of various components of Fire detection & protection system given in this specification. In case of conflicts of Technical details of the components of Fire detection & protection system and customer specification (annexure-13), then stringent of the two specifications shall be followed. 8.3. Purchaser shall provide the power supplies for FDA system as per scope markings indicated in Annexure – 11 of this specification. Further conditioning & distribution within Fire alarm Panels & HMIs shall be in bidder scope. Bidder to consider Power supply unit with battery along with spike arrester cum distribution board for extending power supply to PC (CPU, Monitor) & Printer. 8.4. One set of 24V DC redundant power supply system comprising of 2 x 100% chargers and 1 x 100% batteries shall be provided for fire alarm panel. The batteries for fire alarm system shall be sealed maintenance free lead acid type. The battery backup for each fire alarm panel shall be 24 hours and 30 minutes (in alarm conditions). At least 25% of the devices shall be considered to be active in alarm conditions. Each of the redundant chargers shall be sized to meet connected load requirements and keep the connected batteries full charged (Float Mode). Furthermore, the charger shall be sized to enable the boost charge of a fully discharged battery in 10 hours while feeding the load. 8.5. The batteries shall be sized as per relevant IEEE standard. For battery sizing calculation, an aging factor of 0.8, a temperature correction factor (based on		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		temperature of 4 deg. C), voltage drop of 2V in cables. Capacity factor, Float Correction Factor, as per Battery Supplier Standard, shall be taken into consideration, if applicable and ambient temperature shall be considered as the electrolytic temperature. The sizing of the battery shall be as approved by purchaser during detailed engineering. 8.6. The battery chargers and batteries shall be placed at a suitable location inside the fire alarm panel with partitions. 8.7. Vendor shall supply accessories (like cable glands, lugs, etc.) required for termination of purchaser's as well as vendor power & control cables at vendor supplied equipment. 8.8. Vendor shall furnish the quantity of feeders required along with capacity during order execution with calculations. 8.9. All internal distributions shall be designed such that a single power fault in any instrument branch system shall not cause a trip of the entire system. Each consumer shall be provided with separate switch & isolation fuse.		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company. 9. SCOPE MATRIX FOR SUPPLY, ENGINEERING AND ERECTION & COMMISSIONING <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>S.No.</th> <th>Description</th> <th>Engineering by</th> <th>Supply by</th> <th>Erection by</th> <th>Supervision of Erection by</th> <th>Commissioning by</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>A</td> <td colspan="7">Fire Detection & Alarm System</td> </tr> <tr> <td>1</td> <td>FDA System [Fire alarm panels, Operating Station, Softwares, including all erection & commissioning hardwares].</td> <td>Bidder (Note-3)</td> <td>Bidder</td> <td>BHEL</td> <td>Bidder (Note-1,2)</td> <td>Bidder + BHEL (Note-2)</td> <td>Refer Annexure-[04], [11], [12] & [14] for inputs</td> </tr> <tr> <td>2</td> <td>Detectors, control modules, hooters, call points & all other devices</td> <td>BHEL</td> <td>Bidder</td> <td>BHEL</td> <td>Bidder (Note-1,2)</td> <td>Bidder + BHEL (Note-2)</td> <td>Refer Annexure-[04], [11] & [12] for inputs</td> </tr> <tr> <td>4</td> <td>Power & Control Cables</td> <td>Bidder</td> <td>Bidder</td> <td>BHEL</td> <td>Bidder (Note-1,2)</td> <td>Bidder + BHEL (Note-2)</td> <td>Refer Annexure-[04], [11] & [12] for inputs</td> </tr> <tr> <td>6</td> <td>FDA Layouts Engineering</td> <td>BHEL</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td></td> </tr> <tr> <td>7</td> <td>FDA system engineering / Loop configuration</td> <td>Bidder</td> <td>NA</td> <td>NA</td> <td>Bidder</td> <td>Bidder + BHEL (Note-2)</td> <td></td> </tr> <tr> <td>8</td> <td>Erection hardware required for FDA system</td> <td>Bidder</td> <td>Bidder</td> <td>BHEL</td> <td>Bidder (Note-1,2)</td> <td>Bidder + BHEL (Note-2)</td> <td>Refer Annexure-[04], [11] & [12] for inputs</td> </tr> <tr> <td>B</td> <td colspan="7">Water Based Fire Protection System</td> </tr> <tr> <td>1</td> <td>Water Based Fire Protection Equipment like DV, pipes, fittings, hydrant valves, hoses, hose box etc. as per Annexure – 02</td> <td>Bidder (Engg of components as applicable)</td> <td>Bidder</td> <td>BHEL</td> <td>BHEL</td> <td>BHEL</td> <td>Bidder to sought supervision of E&C</td> </tr> </tbody> </table> Notes:- 1) Termination accessories and termination of all types of cables at bidder supplied items/panels shall be in Bidder scope. 2) BHEL will provide the necessary man power required for commissioning. However system commissioning shall be done by bidder only. 3) Engineering of Panels, Loop cards, model selections, logic development, configuration of software, panels networking etc. are part of Bidder scope. Loop configuration / sizing means deriving Number of loops, Elements per loop, Elements per panels, Maximum loop length, Modules per panel, panel networking etc. based on information such as locations of panels, building wise BOQ (detectors / devices), Indoor cable lengths, outdoor cable lengths (Distances between panels to be derived by bidder based on location of panels indicated in plot plan) and type / size of cables mentioned in specification. Based on the above facts , Bidder to select FDA System (Make and Model number) based on the inputs specified in the NIT and above clarification. 4) Any special activities involved in erection like FO cable splicing, termination, etc. shall be by bidder, if applicable.								S.No.	Description	Engineering by	Supply by	Erection by	Supervision of Erection by	Commissioning by	Remarks	A	Fire Detection & Alarm System							1	FDA System [Fire alarm panels, Operating Station, Softwares, including all erection & commissioning hardwares].	Bidder (Note-3)	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[04], [11], [12] & [14] for inputs	2	Detectors, control modules, hooters, call points & all other devices	BHEL	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[04], [11] & [12] for inputs	4	Power & Control Cables	Bidder	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[04], [11] & [12] for inputs	6	FDA Layouts Engineering	BHEL	NA	NA	NA	NA		7	FDA system engineering / Loop configuration	Bidder	NA	NA	Bidder	Bidder + BHEL (Note-2)		8	Erection hardware required for FDA system	Bidder	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[04], [11] & [12] for inputs	B	Water Based Fire Protection System							1	Water Based Fire Protection Equipment like DV, pipes, fittings, hydrant valves, hoses, hose box etc. as per Annexure – 02	Bidder (Engg of components as applicable)	Bidder	BHEL	BHEL	BHEL	Bidder to sought supervision of E&C
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company. 10. SUB VENDOR LIST 10.1. For Fire Detection & Alarm System <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">SI NO.</th> <th style="width: 30%;">Item Description</th> <th style="width: 40%;">Suggested make</th> <th style="width: 20%;">Remarks</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Complete FDA system</td> <td>Notifier / Esser / Simplex / Edwards / Siemens /Schrack (International Standards such as British, USA, VDE)</td> <td>Refer note-1 below</td> </tr> </tbody> </table> <u>Note:-</u> 1) If required, bidder may propose additional sub vendors with proven track record (validated with credentials) for the above items and subjected to BHEL / customer approval during post ordering of the package. 10.2. For Water based items and portable extinguishers, refer Annexure - 08 for sub vendor list. 10.3. Bidders must follow the given sub vendor list (Annexure-08). 11. QUALITY, INSPECTION AND TESTING 11.1. For all the items listed in BOQ (refer Annexure – 03, 04 & 05), inspection shall be done by BHEL/BHEL's Third Party Inspection Agency. 11.2. Refer Annexure – 09 for typical quality plans. 12. DOCUMENTATION 12.1. Submission of documents shall be as per “Master documents schedule” inline with Annexure – 10 after placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets). If any additional documents required to include in MDL, the same shall be discussed and finalized during kick off meeting. It is bidder responsibility to arrange kick off meeting within 1 week of the PO and collect all the necessary additional inputs if any. 12.2. Further BHEL will provide comments on vendor submitted document within 14 working days for initial submission. Vendor shall follow up with BHEL for obtaining approvals on documentation in time.					SI NO.	Item Description	Suggested make	Remarks	1	Complete FDA system	Notifier / Esser / Simplex / Edwards / Siemens /Schrack (International Standards such as British, USA, VDE)	Refer note-1 below
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1	Complete FDA system	Notifier / Esser / Simplex / Edwards / Siemens /Schrack (International Standards such as British, USA, VDE)	Refer note-1 below									
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		12.3. Revised drawings / Documents shall be submitted by Bidder in 7 days of receipt of comments / observations from BHEL. BHEL shall revert within 7 days on receipt of these revised documents / drawings from vendor for approvals. 12.4. All the document approvals required for manufacturing shall be completed with 2.5 months from P.O to meet the P.O delivery schedule. Accordingly, vendor shall ensure the submission of documents (which are required for manufacturing) and obtain their approvals. 12.5. Vendor shall obtain final approvals on all technical documentation and quality documentation before inspection dates. 12.6. It is vendor's responsibility to obtain all necessary approvals from BHEL as earliest as possible to meet PO delivery schedules. Accordingly vendor to plan and execute the supplies in time. 12.7. The following documents to be submitted before dispatch of items /equipment / materials. 16 sets of each of the documents shall be forwarded to purchase department. a) Complete O& M manual / Catalogues as applicable b) All approved Engineering documents / datasheets / drawings / test certificates / COC c) As-Shipped documents / shipping list d) As-Built documents e) Guarantee / warranty documentation for the applicable items f) 3 sets of CD-ROM – containing O&M manual and Engineering documents (1 set to be included with item dispatch and balance to BHEL purchase department). 13. MARKING, PACKING AND DESPATCH 13.1. All items shall be marked (stamped/etched) in accordance with the applicable code/standard/specification. In addition, the item code, if available, shall also be marked. 13.2. For ease of identification, the color of painted strip (wherever required) shall be as per the applicable standard. 13.3. Part number/Dispatch link-up of all the equipment/items supplied and also their correlation with system/drawing/approved BOQ.		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		13.4. Paint or ink for marking shall not contain any harmful metal or metal salts which can cause corrosive attack either ordinarily or in service. Special items/smaller items shall have attached corrosion resistant tag providing salient features. 13.5. The equipment shall be transported to site by the vendor in fully assembled condition. However, in case some components are liable to be damaged during transit, the same shall be dismantled and supplied separately, to be reassembled at site by vendor. Assembly of the item supplied loose at site and repairing of any item damaged during transport shall be in the vendor's scope. The vendor shall send each consignment to site with a detailed packing list. The same shall be furnished to BHEL compulsorily. 13.6. All the spares-mandatory spares, O&M spares, any other spares-shall be packed and sent to site in separate packages. The components of main order and spares order shall be packed in separate boxes and shipped to site. In NO case, main supply and spare supplies should be shipped in a combined package. 13.7. All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for transportation by ship/rail or trailer. The equipment shall be wrapped in polythene sheets before being placed in crates/cases to prevent damage to the finish. Crates/cases shall have skid bottom for handling. 13.8. Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO Nos.' etc. shall be clearly marked on the package together with other details as per purchaser order. 13.9. The equipment/items may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains/high ambient temperature. 13.10. The following minimum packing procedures shall be followed:- - All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds. - All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling. - Each variety and size of item shall be supplied in separate packaging marked with the purchase order no., item code (if available), and the salient specifications. - All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site. - All the items which the Bidders considered liable to be damaged during shipment or storage, shall be packaged for separate shipment. If instruments are removed from the panel, they and their connection shall be suitably tagged to		
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.		ensure simple re installation at the job site. Each instrument shall be sealed in plastic bags containing moisture absorbing desiccants. f) It shall be bidder's sole responsibility to protect all the material during period of dispatch, storage and erection against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid atmosphere, rough handling in transit and including delays in transit. g) O&M Spare parts shall be packaged separately and clearly marked as 'O&M Spares '. Refer Annexure – 16 for details. h) Tools & tackles to be packed separately & suitably tagged.		
Ref.	Doc.			

