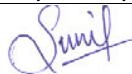
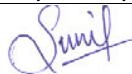
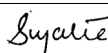
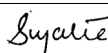
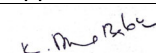
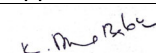
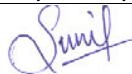
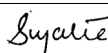
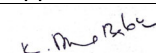


ESP-001- 2A Rev . 00		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD		<table border="1"> <tr> <td colspan="2">Std. / Doc. Number</td> </tr> <tr> <td colspan="2">PY 56391</td> </tr> <tr> <td>Rev. No.</td> <td>00</td> </tr> <tr> <td colspan="2">Sheet 1 of 14</td> </tr> </table>		Std. / Doc. Number		PY 56391		Rev. No.	00	Sheet 1 of 14								
Std. / Doc. Number																				
PY 56391																				
Rev. No.	00																			
Sheet 1 of 14																				
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>Technical Specification for</u> <u>Fire Detection & Alarm System</u> <u>1x600MW PANKI THERMAL POWER EXTENSION PROJECT</u>																		
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PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391Rev. No. **00**

Sheet 2 of 14

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SL No.	DESCRIPTION	Page No.	SL No.	DESCRIPTION	Page No.
1.	Title	1	25.	Vendor List (if required)	11
2.	Index	2	26.	Checklist	12
3.	Scope	3	27.	No Deviation Format	13
4.	Codes, Standards & Regulations	3			
5.	Statutory Approvals	3		Annexures	No. of pages
6.	Material selection & Sourcing	3	28.	Annexure-A: BOQ	4
7.	Instructions to Bidders	5	29.	Annexure-B: Master Document List	4
8.	Scope Matrix for Supply, Engineering and Installation & commissioning	6	30.	Annexure-C: Price bid Format	5
9.	Technical specifications	6	31.	Annexure-D: Pre Bid Query Format	1
10.	Bill of Material	6	32.	Quality Requirements	
11.	Acceptance Criterion	7	33.	Vendor List	6
12.	Equipment's & services to be provided by BHEL	7	34.	Schematic Diagram of FDA System	7
13.	Equipment's & services to be provided by Bidder	7	35.	Plot Plan	1
14.	Power Supply	7	36.	Design Basis Report	33
15.	Earthing	7	37.	Technical spec for FDA for 1x600 MW Panki TPEP (Contract Docs)	32
16.	Bidder's scope of services	8			
17.	Mandatory Spares	8			
18.	Erection & Commissioning Spares	9			
19.	Training	9			
20.	Documentation	9			
21.	Marking, Packing And Dispatch	9			
22.	Testing, Installation, Commissioning & Acceptance	10			
23.	System integration Test	10			
24.	Warranty	11			



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391

Rev. No.

00

Sheet 3 of 14

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1. SCOPE:

- 1.1 Design, Engineering, Manufacturing, Assembly, System Integration, Testing at vendor works, Inspection by purchaser, Supply (Packing and Transportation to sites), Installation Support and commissioning of Fire Detection and Alarm System.
- 1.2 The material supply and installation shall be done as per the applicable codes and standards. Responsibility of the bidder is up to final handover of FDA systems to End user.
- 1.3 Training of End user / purchaser's manpower to operate and maintain the system.
- 1.4 Supply of complete documentation covering design, sizing, installation, operation and maintenance aspects and technical details of bought out components, as-built drawings & Device charts of the system and tests carried out during commissioning.

2. CODES, STANDARDS & REGULATIONS

- 2.1 Tariff Advisory Committee (TAC)/LPA India/NFPA USA
- 2.2 Underwriters Laboratories (UL)-USA,
- 2.3 VDS Standards,
- 2.4 Loss Prevention Certification Board (LPCB),
- 2.5 Factory Mutual (FM),
- 2.6 Indian Electricity (Supply) Act (IEA)
- 2.7 Rules for Fire Alarm System of India, and
- 2.8 IS 2189 (Selection, Installation and Maintenance of Automatic Fire Detection and Alarm System-Code of Practice).
- 2.9 Any other equivalent internationally recognized body acceptable to BHEL/End customer.

3. STATUTORY APPROVAL:

- 3.1 The offered components (detection panels, detectors, sounders, flashers, manual call points etc.) shall conform to relevant parts/sections of EN-54 and shall have certification by at least one of the either VdS (Germany), UL (USA), FM (USA), DBI (Denmark), LPCB (UK), BIS-India or equivalent international standards.
- 3.2 Wherever applicable, compliance/conformance certificates shall be supplied with all the components and devices.
- 3.3 Project Specific approval are listed below. The same need to followed for the project:

S. No.	Project Name	All equipment in the entire fire detection system shall have the approval/listed from one of the followings :
1.	1x660 MW Panki TPS	i) UL of USA ii) LPCB-UK iii) BIS-India iv) FM-USA v) VDS- Germany

4. MATERIAL SELECTION AND SOURCING:

- 4.1 For the project, all components and devices like control panel, detectors, sounders, manual call points etc shall be products of a single OEM and shall be manufactured by the OEM. Third party manufactured products are not acceptable.
- 4.2 In exceptional conditions, where the OEM is not manufacturing a detector type; then the OEM shall approve compatibility of the offered detector explicitly. This approval must be a part of the bid.
- 4.3 All the interface modules to achieve full functionality will be responsibility of the vendor.
- 4.4 Accessories like, PC, SMF, batteries, cables etc can be of other make but the OEM of FAS and Purchaser should approve them.
- 4.5 The OEM shall certify that the supplied components / products have been newly manufactured & tested in compliance with the relevant parts of EN54 standards and the components are free from defects in design, material & workmanship.
- 4.6 The reference of vendor's order on OEM and purchaser's order on the vendor will be mentioned on the certificate.
- 4.7 Bidder to note that all the detections items shall be loop powered. In case loop powered devices are not available in the make offered, bidder shall consider the necessary modules along with the devices.
- 4.8 In case the bidder is offering a FDA system, where the addressable devices do not have in-built fault isolator, then required number of isolator modules shall be provided as per IS:2189 considering all the devices specified in BOQ.

ESP-001- 2A Rev . 00		बी एच ई एल BHEL		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD		Std. / Doc. Number PY 56391 Rev. No.00 Sheet 4 of 14	
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. INSTRUCTIONS TO BIDDERS 5.1 Offers with incomplete information, offering incomplete BOQ against each material codes will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder. 5.2 Any technical features, over & above BHEL enquiry specification requirements proposed by bidder will not be given preference for the purpose of evaluation. 5.3 Bidders are advised to contact BHEL for essential technical queries, if any, in writing within one week of issue of Enquiry. In the event of any conflict between these specifications, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications before bid submission. 5.4 This specification shall be read in conjunction with all its Annexures. In case of any discrepancy arising between this specification & its enclosures, the most stringent of all (as determined by purchaser) shall be followed. Further, if a requirement in this specification or any of the enclosures, calls for a decision from the Purchaser, it shall be bidder's sole responsibility to clearly bring out/highlight the same distinctively in his pre-bid queries, so as to enable purchaser to furnish their decision/clarification. 5.5 If such issues/requirements are not duly addressed by bidder during the pre-bid stage and if such issues/requirements are observed later during order execution stage, it shall be binding on the bidder to comply with the final decision made by the purchaser subsequently, without any cost, delivery, or any other commercial implications. 5.6 Compliance with this specification shall not relieve the bidder of the responsibility of furnishing equipment and accessories / auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions. 5.7 Bidders are advised to comply to specification in total, unless the requirement is not feasible. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market. 5.8 Reasons for the deviations shall be specified in the Remarks column. All such deviations/queries shall be clarified from BHEL before submitting the techno-commercial bid. 5.9 In post-bid no deviations/clarification are allowed including any price impact. Bidders are advised to attend Pre-bid meeting at BHEL office. Schedule for the pre-bid meeting shall be informed within one week from the date of enquiry. Pre-bid meetings shall be planned & conducted (if required) in 2nd week from the date of enquiry. 5.10 Bidder to plan, intimate to BHEL and visit BHEL offices along with their Technical queries for across table clarifications. However, it is complete responsibility of bidder to clear all queries, clarity on scope of supplies &services, Intent of specification and quote techno-commercial bid accordingly. 5.11 Pre-bid technical queries shall be submitted / offered only in one attempt. Multiple chances for prebid queries will not be entertained. Hence there shall not be any clarifications/deviations in the posted technical bids. Offers with incomplete information, request for clarifications, technical deviations will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder. 5.12 The design information, specifications and drawings indicate the "Minimum" requirements and are intended to enable Bidders to ascertain the extent of the work involved. 5.13 The Bidder shall accept full responsibility for the completeness and for the faultless working of all the equipment's and the FDA system as a whole. These shall be executed on the basis of proven design principle and in accordance with the latest state of the art and good engineering practices. 5.14 Standardization of equipment, materials etc. shall be employed in the design. Care shall be taken to ensure safe operation as well as simplicity of assembling and dismantling of all parts of the plant. 5.15 Unsolicited requests from bidders like change in prices, change in model numbers, change in vendors etc., for alterations to their already submitted offer will not be entertained. These would not be taken cognizance, and offers will be evaluated without taking into account such requests/correspondence. 5.16 In case of any conflict between this specification and above codes, standards and guidelines requirements, the most stringent requirement of these shall govern and the decision of purchaser in the resolution of the any such conflict shall be final. However same shall be brought to purchaser by bidder in pre-bid queries is must. If not same is understood as such requirement is obeyed by bidder.					



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391Rev. No. **00**

Sheet 5 of 14

- 5.17 It is bidder's responsibility to select make (OEM) and model of the FDA system and components from the approved vendor base, meeting the technical requirements of the specification.
- 5.18 Contract includes this specification/amendments and pre-bid agreements.
- 5.19 Purchase Order for the FDA system for the project shall be placed on lump sum fixed prices as per tender requirements. PO for supply part will be issued by PE&SD, BHEL Hyderabad.
- 5.20 LOI for supervision of E&C supervision activities will be placed PE&SD, BHEL Hyderabad. While formal PO will be placed by our E&C group from project site office separately.

6. SCOPE MATRIX FOR SUPPLY, ENGINEERING AND INSTALLATION & COMMISSIONING

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, repeater panel, Operating Station, Softwares, including all erection & commissioning hardwares].	Bidder (Note-3)	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[A]
2	Loop configuration of FDA system	Bidder	NA	NA	NA	NA	Indoor loop lengths and Outdoor cable tray layout shall be provided by BHEL during detailed Engg stage (Post ordering stage)
3	FDA Layouts Engg.	BHEL	NA	NA	NA	NA	
4	Detectors, control modules, hooters, call points & all other devices	BHEL	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[A] for project BOM
5	Network Components like Switches, LIUs, Patch Cards, Media converters, etc.	Bidder	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	
6	Power & Control Cables	BHEL	BHEL	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Bidder to Note the type /size of cable being supplied by BHEL
7	Network & Fiber optic Cables	Bidder	Bidder	BHEL (Note-4)	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Bidder refer BOM for project inputs
8	Interface / integration of FDA system with DCS (including supply of necessary hardwares + softwares)	Bidder	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	
9	Erection hardware required for FDA system including accessories required for termination of BHEL supplied cables.	Bidder	Bidder	BHEL	Bidder (Note-1,2)	Bidder + BHEL (Note-2)	Refer Annexure-[A] for inputs

Notes:

- 1) Termination accessories (cable gland, lugs, etc.) 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 erection & commissioning. However, bidder shall do system commissioning.
- 3) Engineering of Panels, Loop cards, model selections, configuration of software's, etc. are part of Bidder scope.
- 4) Any special activities involved in erection like FO cable splicing, termination, terminal kits etc. shall be by bidder.



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391Rev. No. **00**

Sheet 6 of 14

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7. TECHNICAL SPECIFICATIONS:

S. No.	System	:	Technical specifications
[A] Fire Detection & Alarm System			
1	BOM	:	BOM provided as Annexure for the project along with this specification.
2	Other technical requirements	:	1) Refer Annexure-[A] of this specification for project/site specific technical requirements of FDA systems. 2) Software Licenses shall be valid for lifetime. 3) Bidder to confirm that entire FDA System shall be subject to approval by TAC accredited agency to qualify maximum premium discount. Responsibility to get approval from TAC Accredited agencies shall rest on BHEL. However, all necessary documentation for obtaining such approvals are in bidder's scope 4) FDA system make and model shall be designed/selected considering the following: a) Applicable standards specific to the project specified elsewhere, b) Technical requirement of FDA specified for the project . c) Information of cables (loop cables & power cables),
3	Panel Sizing w.r.t. no. of loops	:	"Engineering of Panels, Loop cards, model selections, configuration of software's, etc. are part of Bidder scope & vetting of such sizing and selection is in OEM 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 and type/size of cables mentioned in specification. Actual details of building covered by each fire alarm panel shall be furnished during detailed engineering / post order. Stage.

[B] Technical details of cables being supplied by BHEL

S. No.	Project	:	Cable Size	Cable Type
1	1x660 MW Panki TPS	:	Loop Cable: 2C x 1.5 Sqmm Power Cable: 2C x 2.5 Sqmm	Loop Cable: Screened & Twisted Power Cable: Normal

8. BILL OF MATERIAL (BOM):

- 8.1 Bill of Material for the project is enclosed in separate annexures.
- 8.2 The bidder shall also quote unit rate for a unit quantity against each item (per item rate). This rate will become the basis for amending the order for an unlikely scenario where the quantity may need a minor upward/downward, in case there was input revision during the design/ detailed engineering stage. However, this is limited to maximum of (+10 to -20) percentage of actual PO value only.
- 8.3 Appropriate testing equipment's, instruments and assemblies of fire alarm systems calibrated/certified from reputed institutions/laboratories required during commissioning on returnable basis. The vendor at his own cost shall arrange same.
- 8.4 Any other item not listed in the BOM but required for the functioning of the system must also be included in quoted Price.

9. ACCEPTANCE CRITERION:

- 9.1 The reliable operation of the supplied FAS has to be demonstrated after testing and commissioning by conducting a test run of the entire system for one week (24x7), during which no failure of the system shall occur.
- 9.2 The final acceptance of the system will be based on on-field testing of the devices as well as the complete system. Code conformances shall be demonstrated in the acceptance tests. The service check of the system shall be done for 15 days. The equipment will be considered as commissioned after 15 days of uninterrupted successful operation.
- 9.3 After complete handing over, System Architecture Drawings, as built drawings for all building, technical catalogues & literatures, O & M manual, checklist & recommendation from manufacturers, acceptance Reports, pre-commissioning test reports in soft (in CDs) & hard (printed) form shall be submitted by vendor.



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391

Rev. No.

00

Sheet 7 of 14

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10. EQUIPMENTS AND SERVICES TO BE PROVIDED BY PURCHASER (BHEL)

- 10.1 Supply and laying of power cables for 230V, 1-Ph, 50Hz power supply up to various fire alarm panels. Termination of power cables at purchaser's supplied equipment end shall be by purchaser.
- 10.2 Provision of space for mounting or placement fire alarm panels.
- 10.3 Necessary cable trays in cable trenches for laying control cables & necessary cable racks for laying above ground cables, wherever required.
- 10.4 Lighting of all buildings.

11. EQUIPMENT TO BE PROVIDED BY BIDDER:

- 11.1 Bidder as a minimum shall offer any item though not specifically mentioned but required for safe and satisfactory operation of system.
- 11.2 Any modification or changes for taking care of TAC/accredited agency approval of system shall be treated as included and shall be supplied within the quoted price and no extra shall be admissible on such account.
- 11.3 Termination of power, loop, other internal cables at vendor supplied equipment's shall be provided by vendor irrespective of cables are supplied by bidder or purchaser.
- 11.4 Termination at Vendor supplied equipment including lugs and glands shall be done by vendor.

12. POWER SUPPLY:

- 12.1 Purchaser shall provide the power supplies as listed below in this specification. Further conditioning & distribution within Fire alarm Panels, & HMIs shall be in bidder scope.
- 12.2 Bidder to consider Power supply unit with battery along with spike arrester cum distribution board for extending power supply to PC (CPU, Monitor), Printer, FAPs.
- 12.3 Vendor shall provide standalone PDB (if required) with necessary protections & metering for powering equipment's under their scope. Power distribution scheme shall be approved by purchaser.
- 12.4 Vendor shall supply accessories (like cable glands, plugs, ferrules, etc.) required for termination of purchaser's as well as vendor power & control cables at vendor supplied equipment's.
- 12.5 Vendor shall furnish above feeders capacity during order execution with calculations.
- 12.6 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.

S. No.	Project	:	Source of Power	Remarks
1	1x660 MW Panki TPS	:	UPS	Single feeder of 230 V UPS power at all fire alarm panels

13. EARTHING

- 13.1 Each system earthing shall be carried in-line with industry standard practices. Vendor shall furnish scheme for recommended earthing system/earth pit during order execution for approval.
- 13.2 Earth points of all panels (located in a single building) shall be looped together and shall be terminated at BHEL's earth raisers at single point provided for each building.
- 13.3 All hardware with in package required for earthing & connectivity up to BHEL's earth points shall be in vendor scope.

14. BIDDER'S SCOPE OF SERVICES

- 14.1 Scope includes Supervision of erection & commissioning, performance guarantee testing & trial run and final handing over to end customer for the supplied systems.
- 14.2 Number of man-days and number of visits as specified in the "Unpriced price bid format", Annexure-J, shall be considered. However, either or both of the number of man days or no of visits may increase / decrease based on the actual site requirements for which unit rates shall be operated.
- 14.3 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.
- 14.4 Following shall be the scope of work for services:
- 14.4.1 Vendor services includes supervision of erection & commissioning, performance guarantee testing & trial run and final handing over to end customer for the supplied systems. Further, the scope involves lodging, boarding & local travel conveyances. Vendors shall arrange their own lodging, boarding & traveling.
- 14.4.2 Vendor visit charges includes travel to & fro travel from vendors work to site,
- 14.4.3 Vendors shall arrange their own Test equipment's, commissioning tools, manpower etc as required.



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391

Rev. No.

00

Sheet 8 of 14

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14.5 **Above services shall be ordered by BHEL Site at the time of commissioning.** However, vendor shall submit the price offer for services as per “Price bid format” (Annexure-J) and same shall be considered for L1 evaluation (Project wise).

14.6 Broad scope marking of supervision of Erection & Commissioning between bidder & purchaser is as listed below:

Activity	Scope
Transportation up to Stores	Vendor
Unloading	Purchaser
Supply Verification as per packing list, Transit damage inspection	Purchaser
Storage	Purchaser
Custody of items in stores	Purchaser
Issue of Items from Stores	Purchaser
Shifting of panels/equipment's to Intended Location	Purchaser
Provision of Crane/manpower for Shifting of the equipment's	Purchaser
Unpacking of equipment's	Vendor
Base frames stand below false floor supply and installation	Purchaser
Installation of equipments at intended locations	Purchaser
Supply of Accessories for installation of equipment's	Vendor
Inter equipment Cable supply (Except loop cable)	Vendor
Inter equipment Cable laying, terminations & Cable glanding	Vendor
Inter equipment earthing connectivity, termination & connections to BHEL's earth points	Vendor
Cable glanding Lugging, Ferruling, Terminations, supply of cable glands at both cable ends of vendor supplied equipment's	Vendor
Supply of cable from field to system	Purchaser
laying of field cables/cables from purchasers panels up to system, installation JBs in field	Purchaser
Termination all incoming & outgoing cables to/from system	Vendor
Supply & installation of cable glands, lugs, ferrules etc required for termination of purchaser cables in FDA system	Vendor
Loop Checking at Control Room from System to marshalling Terminals	Vendor
Loop Checking from field to marshalling Terminals	Purchaser
Erection Supervision	Vendor
Commissioning	Vendor
Commissioning Supervision	Purchaser
Erection & Commissioning co-ordination	Purchaser
Provision of erection & commissioning tools & tackles	Vendor
Erection & commissioning spares, consumables	Vendor

15. **MANDATORY SPARES** - Spares requirement shall be as per enquiry & “Mandatory spares list” provided in Bill of Material. All mandatory items shall be packed separately in “RED” color boxes and shall be shipped to respective project site.

16. ERECTION & COMMISSIONING SPARES

16.1 All commissioning spares as required during erection and commissioning of all the systems are included in bidder's scope & shall be supplied along with the main supply/package.

16.2 Bidder to ensure that all the spares are procured from the original equipment manufacturers (as per their recommendation) and shall make them available at site well before the start of commissioning activities.

17. TRAINING

17.1 Bidder shall arrange training for Owner's personnel. Different type of courses shall be offered for operation / process engineers and operators, instrument maintenance engineers and technician.

17.2 Travel and living expenses of the owner's personnel shall be borne by the Owner. Apart from the hardware and software maintenance training and site training, bidder shall also offer operation training meant for operating personnel.

17.3 The various facilities available in the system for operation, actions required during emergencies and identifying the various diagnostic messages shall be the main contents of the operation training.

17.4 The duration & location of the training shall be as per “Unpriced price format”, Annexure-J. However, these prices will not be considered for L1 evaluation.

ESP-001- 2A Rev . 00		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	Std. / Doc. Number PY 56391 Rev. No. 00 Sheet 9 of 14
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18 DOCUMENTATION- AS PER MASTER DOCUMENT LIST (MDL) 18.1 Information to be included with offer, vendor shall make the offer in detail, with respect to every item of the Purchaser's specifications. Any offer not conforming to this shall be summarily rejected. - Duly filled & Signed copy of Check list - Deviation list, if any (as per "No deviation format" given in this specification). If there are no deviations, bidders shall submit "Deviation format" by mentioning deviations "Nil". - Unpriced price schedule (To be submitted compulsorily without fail) - Signed copy specification (To be submitted compulsorily without fail) - Sub-vendor list of major items like FDA Components, UPS, OFC Cables, Workstations etc., 18.2 Documentation after P.O. Placement - Submission of documents as per "Master documents schedule" (which will be finalized in Kick-off meeting after award of the contract) within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets) <i>All vendor documents and its sub-items shall be submitted to End user for approval during order execution. Any comment furnished by End user / BHEL shall be taken care by vendor during ordering execution.</i> - Further BHEL will provide comments on vendor submitted document within 10 working days for revision & resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals. - Revised drawings / Documents shall be submitted by Bidder in 07 days of receipt of comments / observations from BHEL. BHEL shall revert within 10 days on receipt of these revised documents / drawings from vendor for approvals. - Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates. - It is vendor's responsibility to obtain approvals from BHEL as earliest as possible to meet PO delivery schedules. Accordingly, vendor to plan and execute the supplies in time. 18.3 Documents to be submitted during final shop testing and before equipment dispatch. (Note: submission of these documents are commercially linked) - all in 16 sets (2 sets to be included with item dispatch and balance to BHEL purchase department). - Complete O& M manual. - Approved Engg documents - As-Shipped documents - As-Built documents - Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL's Customer 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). 19 MARKING, PACKING AND DISPATCH 19.1 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. 19.2 For ease of identification, the color of painted strip (wherever required) shall be as per the applicable standard. 19.3 Part number/Dispatch link-up of all the equipments/items supplied and also their co-relation with System/drawing/approved BOM. 19.4 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. 19.5 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 the 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. 19.6 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.			



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391Rev. No. **00**

Sheet 10 of 14

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- 19.7 Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO Nos.', Project Site name, BHEL emblem, vendor address etc., shall be clearly marked on the package together with other details as per purchaser order.
- 19.8 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, unless otherwise agreed.
- 19.9 In case of imported/exported items, seaworthy packing shall be done as per specification no: HY0490573 (latest revision). This specification shall be obtained by vendor on request.
- 19.10 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 ensure simple re installation at the job site. Each instrument shall be sealed in plastic bags containing moisture-absorbing desiccants.
 - 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.
 - If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure boxes distinctly marked in Red color with boldly written "S" "mark on each face of the containers /secure boxes*
 - Commissioning spares, Tools & tackles to be packed separately & suitably tagged.

20 TESTING, INSTALLATION, COMMISSIONING & ACCEPTANCE

Following major items, Final Inspection including document verification as per approved QAP shall be carried out by CUSTOMER /CONSULTANT/ CUSTOMER's Third Inspection Agency & BHEL/BHEL's Third Party Inspection Agency at vendor works. Rest of the items shall be by BHEL/BHEL's Third Party Inspection Agency:

S.No	Item	Inspection by
1	Fire Alarm panels & Detectors	CUSTOMER /CONSULTANT/ CUSTOMER's Third Inspection Agency & BHEL/BHEL's Third Party Inspection Agency
2	All other items	BHEL/BHEL's Third Party Inspection Agency

21 TESTING: SYSTEM INTEGRATION TEST (SIT)

- 21.1 The Fire alarm equipment including various sub units shall be completely wired and interconnected for the purpose of integrated tests.
- 21.2 Fire and fault alarm conditions shall be simulated on each line and channel and the complete operational sequence shall be checked. The channels shall be tested for their capability for various detector combinations and types of detectors.
- 21.3 The following tests shall be simulated, including any other test as required:
- Single Fire Alarm, Multiple alarms in single loop & multiple loops
 - Single fault and Multiple faults (Earth fault, open circuit and short circuit fault)
 - Multiple alarms & Multiple faults
 - System diagnostic tests
 - System response time, time taken for sound mute/ acknowledge & reset actions at various locations etc. shall be checked.

22 WARRANTY:

- 22.1 Warranty shall be valid for 24 months commencing from date of commissioning or 36 months from the date of supply whichever is earlier unless other specified in respective project specific annexure.
- 22.2 Free upgrades to new versions and introductory training for the new version of the GUI software and programming software shall be provided free of cost during the warranty period.



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391

Rev. No. 00

Sheet 11 of 14

23 VENDOR LIST:

Project specific vendor list is annexed along with the specification. Bidder to follow the same. If the specification does not inform any specific vendor list for any component specified in the BOM, then bidder to propose vendors with following criteria.

S NO.	Item Description	Suggested make	Remarks
1		Bidder shall propose minimum 3 makes meeting technical requirements, project specific approval/standards of the specification during order execution along with credentials.	Refer Note – (1) below

Notes:

- 1) Bidder's proposed makes shall be submitted to customer approval during order execution and based on customer approval bidder to proceed with manufacturing.
- 2) Make and type of detectors shall be subject to Purchaser's approval

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PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391

Rev. No. 00

Sheet 12 of 14

24**CHECK LIST**

(To be filled by BIDDER and submitted along with Technical offer compulsorily)

Enquiry No. / Date :
 Name of the Bidder :
 Project Names :
 Item Description :
 Offer Ref. No. :

S. No	Document	Bidder confirmation (Yes/No)	Remarks
1	Technical offer complies with the specifications and its associated annexures, pre-bid clarifications in Toto and there are no technical deviations. Signed and stamped copy of this specification along with annexures enclosed along with technical offer.		
2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in BHEL format. In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, no commercial implications can be claimed by the bidder		
3	All items are manufactured conforming to latest version of material grade standard and manufacturing standard mentioned in this specifications		
4	Bidder to quote as per BHEL price format only. No other format is acceptable. Bidder to attach un-priced price bid format by indicating "QUOTED" against each item and submit with technical offer duly signed & stamped.		
5	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of + 10% to -20% of order Value.		
6	Bidder to agree that Bill of materials / list of equipment furnished in the offer is only for information; Vendor shall supply all the material to meet the performance, sizing & technical requirement as per specification & its Annexures, scope matrix etc.		
7	Confirm that the quote includes training, commissioning spares, special tool & tackles, mounting hardware/ accessories, terminations, networking components etc. as required for commissioning activities.		
8	Bidder to confirm that all networking components/ hardware software, licenses as required for complete functional operation of the all systems are included.		
9	All the equipments / items / sensors / detectors etc., supplied by bidder are having valid statutory approval certificates and same will be produced at any stage of contract execution to BHEL. The same were eligible to take local statutory regulatory body approval during commissioning of the system		

 (Bidder's Signature and stamp with date)



PRODUCT STANDARD
PROJECT ENGINEERING & SYSTEMS DIVISION
HYDERABAD

Std. / Doc. Number

PY 56391Rev. No. **00**

Sheet 13 of 14

25

DEVIATION FORMAT

Enquiry No.:

Item:

Name of Bidder:

Offer Ref. No.:

Sl. No.	Clause no. & Spec. no.	Description as per Specification	Deviation taken	Nature of Deviation	Remarks

NOTES:

1. Technical offer of the bidder will be evaluated only on the basis of Deviation Schedule. Deviation Schedule constitutes this sheet (with these Notes) duly signed and stamped.
2. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored.
3. Additional sheets in the same format can be attached by the vendor, if necessary.
4. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market.
5. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of Price implications.
6. Reasons for the deviations shall be specified in the Remarks column.
7. If there are no deviations from the specifications, bidder still has to submit the signed copy of this format by writing "NO Deviations" on this format.
8. If the "Deviation Schedule" is not submitted along with the offer, the bidder's offer is likely to be rejected without any further interaction with the bidder. Only the accepted deviations in conjunction with the original tender shall constitute the contract document for the award of job to the bidder

SIGNATURE OF THE BIDDER_____

NAME_____

DESIGNATION_____

DATE_____

COMPANY SEAL

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Std. / Doc. Number

Rev. No.	00
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Sheet 14 of 14

Rev. No.

Date _____

Revision Details

Revised By

Approved By

00

10.01.20

Original issue

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K. Anand Babu

K. M. Rube

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