

	Bill of material [for Main Supply]		Annexure -[A] of PY56391	
	Fire Detection & Alarm System		Rev 00	
	Project:1 x 660 MW PANKI TPS			
BHEL MATERIAL CODE: PY9756391006				
S. No.	Item Description	Quantity [A]	Unit	Remarks
1	Fire Alarm Panel (Each panel shall have 12 Loops) Floor Mounted	15	No.'s	Location of Panels: a) CCR b) CHP MCC-1 c) CHP MCC-2 d) CHP MCC-3 e) CHP MCC-4 f) AHP MCC-1 g) ESP cum FGD Control Room h) DM Plant Control Room i) Fuel Unloading Pump House j) Hydrogen Generation Plant k) Raw Watwer Discharge Pump House l) Chemical House m) LDO P&H Unit n) Admin Building o) Service Building
2	Repeater Panel	2	No.'s	Location of Panels: a) Fire Station b) Cooling Water Pump House
3	Multisensor Detectors with detector base and mounting back box (Analogue addressable)	2460	No.'s	
4	Heat Detectors with detector base and mounting back box (Analogue addressable)	110	No.'s	
5	Probe Detectors (ROR type) with Flameproof Junction box for Fuel tanks (Min. 50 ft x 50 ft coverage for each detector along with counter flange and gasket) (Addressable)	6	No.'s	If addressable detector is not available in offered make, then Module (2 Input + 1 Output) with IP-65 enclosure to be provided along with detector.
6	Beam Detectors (Addressable)	13	No.'s	If addressable detector is not available in offered make, then Module (2 Input + 1 Output) with IP-65 enclosure to be provided along with detector.
7	IR Ember Detectors with inbuilt Air Purge Unit & accessories (Addressable)	42	No.'s	If addressable detector is not available in offered make, then Module (2 Input + 1 Output) with IP-65 enclosure to be provided along with detector.
8	Indoor Manual Call Points with mounting back box (Addressable type)	230	No.'s	
9	Outdoor Manual call points with mounting back box (IP-65 min.) (Addressable type)	130	No.'s	
10	Flameproof Manual call points with mounting back box (Addressable type)	2	No.'s	If addressable MCP (Flameproof) is not available in offered make, then Module (2 Input + 1 Output) with flameproof enclosure to be provided along with detector.
11	Indoor Hooter cum Strobe with mounting back box (Addressable type)	220	No.'s	If addressable Hooter cum strobe is not available in offered make, then Module (2 Input + 1 Output) with IP- 65 enclosure to be provided along with detector.
12	Exit Sign (Self illuminating)	242	No.'s	
13	Response Indicators	700	No.'s	
14	Siren (1 km) with Siren Control panel	1	No.'s	415 V, 3-Phase Operated Siren and 230V, 1-Phase Operated Siren Control Panel
15	Interface module for Siren Operation with IP-65 enclosure	1	No.'s	
16	Digital LHS Cable for Cable Galleries	19300	Meter	
17	Digital LHS Cable for Coal Conveyors	8300	Meter	
18	Digital LHS Controllers (2 km range)	1	Lot	Refer Note-12 below

19	End of Line Resistance with Terminal Box	59	No.'s	
20	Cable Junction Box for 2P x 2.5 sqmm MICC Cable	20	No.'s	
21	LHS Cable Jointing Box	28	No.'s	
22	Module for LHS Cable (1 Input + 1 Output) with IP-65 enclosure	72	No.'s	
23	Module for Deluge Valve (2 Input + 1 Output) with IP-65 enclosure	108	No.'s	
24	Module for Limit Switches (2 Input + 1 Output) with IP-65 enclosure	108	No.'s	
25	Module for Tripping (1 Input + 1 Output)	50	No.'s	
26	Module for Monitoring Pumps Status (1 Input + 1 Output) with IP-65 enclosure	42	No.'s	
27	Module for Interface with DCS (1 Input + 1 Output) with IP-65 enclosure	15	No.'s	
28	Module for Interface with IGES (1 Input + 1 Output) with IP-65 enclosure	5	No.'s	
29	24 V DC Power Supply Modules with Battery Back Up	10	No.'s	5A, 24V DC with battery backup of 30 min.
30	Operator Workstation & A4 size color laser Printer along with Graphic software i.e., (GUI) Software	3	No.'s	Location of OWS: a) CCR b) CHP MCC-1 c) Fire Station
31	Laptop along with Fire Alarm Panel Commissioning Software License /Dongle	1	No.'s	Handing over of license shall be done after commissioning of complete system
32	Furniture for Operator Workstation & Printer	3	Sets	
33	Mini-UPS for Operator Workstation & Printer (To be sized by bidder)	1	No.'s	Location : Fire Station
34	8 core Armoured single mode Optical Fiber Cable with 2" rodent proof HDPE conduits (for fire alarm panels and PC networking)	12500	Meter	Refer Note-10, 11 below & Item sl no 1 for panel locations
35	Erection & Termination hardware for Optical Fibre cables	1	Lot	For BOQ refer item Slno 35 and Note-10, 11
36	All hardware & Software required (including OPC Licenses etc.) required for establishing the networking between all fire alarm panels, repeater panels, DCS, PCs, Printers etc shall be considered.	1	Lot	
37	Cable Tags for 1P x 1.5 Sqmm Cable	360	No.'s	
38	Cable Tags for 2C x 2.5 Sqmm Cable	170	No.'s	
39	Cable Saddle + Saddle Bars along with fixing screws and rawl plugs for 1P x 1.5 sqmm Cable	72000	No.'s	
40	Cable Saddle + Saddle Bars along with fixing screws and rawl plugs for 2C x 2.5 sqmm Cable	46700	No.'s	
41	Nylon Cable Tie for 1P x 1.5 sqmm Cable	46700	No.'s	
42	Nylon Cable Tie for 2C x 2.5 sqmm Cable	20000	No.'s	
43	Mounting Accessories & Erection Hardware for all above items	1	Lot	Refer Note-7 below
Technical Notes:				
1)	Battery sizing of FDA panels is in the scope of bidder. Bidder to considering the panels as fully loaded for sizing purpose. The standby power source (battery bank to power fire detection and alarm system) should be sized for 24 hours of continuous load or 30 minutes in alarm condition (at least 25% devices considered active in alarm condition).			
2)	Power supply to all the detectors/components specified in the BOQ above, should be extended from the Fire alarm Panels Only. Sizing of powersupply modules, batteries size for secondary power, calculation of notification appliance circuit voltage drops, selection of internal components of FDA Panels etc. to be carried out by bidder & panel model need to be selected accordingly. Battery & Power supply calculation sheet verified by OEM and to be submitted to BHEL during detailed Engg for approval.			
3)	In case the bidder offered system is having multiple variants of loop cards, bidders are advised to select loop cards which cater to largest distance.			
4)	Bidder to note that all the above detectors/devices shall be loop powered. In case loop powered devices are not available in the make offered, bidder shall consider the necessary modules as per above BOM.			
5)	Each addressable loop device (Detectors, MCP, Module etc) shall have inbuilt short circuit isolator suitable for Class A wiring.			
6)	Fire alarm panels shall be floor mounted only.			

7)	All erection hardware including back box, fixing screws, lugs, glands, clamps, structural steel, anchor fastner, chains, J-bolts/J-hook, nuts, bolts, flanges etc. for the above items shall be considered in the offer by the bidder. In addition to this, an additional 10% of all erection hardware shall be considered in the scope of bidder. Post order, the vendor need to submit detailed erection document indicating BOQ of erection hardware for each variety of detector/device etc. i.e., Erection hardware for detectors/devices -calculation sheet to be furnished during detailed Engg stage.
8)	All interface modules shall be provided with enclosure suitable for outdoor application.
9)	Unit rates for addition/deletion (+10% to -20%) for Main and mandatory spares shall be applicable
10)	Also necessary erection hardware (jointing kits, termination kits, LIU, patch card, media converter, pit tails, etc) for FO cable shall be considered in the scope bidder. In addition, splicing and termination of FO cable and it's accessories are in bidder scope. Minimum BOM for meeting this requirement is: Splicing tool kit=1 Set, LIU / Media converters=60 No's, Pigtails = 60 No's, Network interface card= 30 No's, bidder to add other items (if any) for completeness of the system.
11)	Fire alarm panels, repeater panels specified in the BOM are to be connected in ring topology using fiber optic cable. Quantity of Single Mode Optical Fiber cable (for networking of Fire Alarm Panels, Repeater Panels, Workstations, Printers etc) is indicated in the BOQ
12)	In case, bidder offers digital LHS controller of 2-Channels with 2 kms range then the quantity shall be 09 nos. However in case bidder offers digital LHS controller of 1-Channel with 2 kms range then the quantity shall be 17 nos.
13)	For Interface / integration of FDA system with DCS redundant OPC Connectivity through FO Cable- necessary hardwares + softwares are to be included in the scope.
14)	LIUs (Fiber Patch Panels / Light interface units) - are to be used for routing, terminating and managing optical cable terminations and should be mounted inside the FAPs & Repeater Panel enclosures
15)	Please consider alarm Temperature of LHS cable as 60 Deg (min.) for cable galleries and 80 Deg (min.) for coal conveyors.
16)	Supply items for which no definite "make/brand" is indicated, shall be procured only from reputed makes & models having proven records of accomplishment and requires purchaser approval.
17)	FAP, Repeater panel, Detectors, Devices, Modules etc. shall be under regular manufacturing range of OEM and have proven track record.
18)	Information/Status of all panels shall be available in all the workstations using GUI Software
19)	All the network switches shall be of high quality and shall be sized to meet the functional requirements as specified. The common switch to which all networks are connected shall be Layer-III switch/router. All the interconnecting cables between network switches shall be fiber optic only. All fiber optic cables shall be terminated directly to network switches through optical fiber port without using media converters.
20)	Bidder to derive the BOM for hardware material based on the make and model components selected for main FDA panel. Accordingly, mandatory spares quantities shall be derived / populated based on definition against mandatory spares sheet . The quantities will be verified during detailed Engg.

	Bill of material [for Mandatory Spares Supply]	Annexure -[A] of PY56391
	Fire Detection & Alarm System	Rev 00
	Project: 1 x 660 MW PANKI TPS	

BHEL MATERIAL CODE: PY9756391014

S. No.	Item Description	Quantity [B]	Remarks
1	SMOKE DETECTORS/ HEAT DETECTORS		
1.1	Photo-electric type detector(Addressable)	10% of population	
1.2	Ionisation type detector(Addressable)	10% of population	
1.3	Indicator Assembly for smoke detectors provided in false ceiling	5% of population	
1.4	Duct Mounted detectors	10% of population	
1.5	LHS Cable	10% of population	
1.6	Spot type Heat detectors	10% of population	
2	INFRA RED DETECTORS		
2.1	IRD unit with local control unit, purging unit, other accessories (for complete replacement)	20% of population	
3	FIRE ALARM CONTROL/ANNUNCIATION PANELS (Addressable)		
3.1	Fuses	100% of population	
3.2	Indicating lamps	100% of population	
3.3	Lamp holders	10% of population	
3.4	Push Buttons	10% of population	
3.5	Selector Control Switches	10% of population	
3.6	Auxiliary relays/Contractors	10% of population	
3.7	Annunciation window lamps	10% of population	
3.8	Control cards for annunciation facia, fire detection system, gas extinguishing etc of each type	10% of population	
3.9	All PCB assmebly cards, loop cards including mother boards etc	10% of population	
3.10'	LCD display units of panels	10% of population	
3.11	Interface units/ modules for noonaddressable devices, output relay modules, supervisory control modules etc	10% of population	
3.12	LED's if applicable	100% of population	
3.14	Power supply modules	10% of population	