

	<u>Bill of material</u> <u>[for Main Supply + Mandatory Spares]</u>	Annexure -[A1] of PY 56217
	<u>FDA System + Optical LHS System + PLC System</u>	Rev 00
	Project: 4X270 MW FPS system - Manuguru Bhadradi	

NOTES ::

1	The no. of fire alarm panels indicated are minimum requirement based on geographical locations. Any additional FAP , if required , based based on the below criteria shall be part of this offer. The number of loops in the Fire Alarm panel shall be selected on the following philosophy: a) All the addressable devices indicated in BOQ shall be connected to the Fire Alarm Panel in Class A wiring. b) 20% of loop capacity shall be left free for addition of devices in future in each loop. c) In addition to the above, 2 number spare loop shall be of maximum capacity and shall be part of panel and battery sizing.
2	Provision for additional loop card shall be made in Fire Alarm Panel. Fire Alarm Panel shall be designed keeping in view of this additional loop card also. However, the supply of this additional loop card is not in bidder's scope.
3	As per contract, Fire Alarm panels shall be provided at the following locations: (a) CCR (Unit-#1 & 2) (b) CCR (Unit-#3 & 4) (c) CHP MCC-2 & CHP Control room (d) Fire Station (e) Storage sheds (Unit-#1 & 2)
4	In addition to the above, in case of requirement of additional Fire Alarm panels due to loop length limitation or number of loops, bidder shall consider the additional fire alarm panels only at the following locations: (a) DM Plant (b) Storage sheds (Unit-#3 & 4) (c) PT Plant
5	230V AC supply feeder shall be provided only at the above locations for additional Fire Alarm panels.
6	The number of Air sampling detectors for Control room floors shall be engineered by the bidder based on the inert gas zones and dimensions of the zones.
7	Bidder to note that above 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.
8	In case the bidder is offering a 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 above devices. The number of isolator modules shall be decided by bidder and quantity shall be reviewed by BHEL.
9	List & quantity of all such equipments and final networking of all panels shall be finalized during detail engineering.
10	All erection hardware including back box, lugs, glands, clamps, structural steel, anchor fastener etc. for the above items shall be considered in the offer.
11	Loop cable shall be Cu conductor armoured 3C x 2.5sq.mm. Power cable shall be Cu conductor armoured 3C x 2.5 sq.mm. Accordingly bidder to take care of all the terminations. Erection hardware like cable tags, saddles, saddle bars, conduits, etc for 75 kms of the above cable be considered.
12	Unit rates for addition/deletion of Main and mandatory spares shall be provided by vendor.
13	Nil
14	Actual quantity of optical fiber cable which shall be used for networking of panels shall be provided by vendor . Vendor shall calculate actual quantity based on input drawings. Quantity shall be reviewed by BHEL.
15	Actual quantity of optical LHS cable shall be provided by bidder. Bidder to calculate the exact quantity based on input drawings. The same shall be part of main offer. Quantity shall be reviewed by BHEL.
16	Bidder to decide the minimum no. of controllers for optical LHS cable based on input drawings and supply the same.
17	Modules shall be provided to monitor two inputs (pressure switches/LHS cable) and control one output (SOV) on each deluge valve.
18	In case the bidder is offering a system, where hooter cum strobe is loop powered, then control modules for actuation of hooter cum strobe is not required.
19	List and Quantities shall be reviewed during detail engineering.
20	Bidder to refer Annexure-[C] of PY56217 as assessment of erection hardware.
21	Bidder to calculate the exact quantity based on input drawings; Page 1 of 6 rates quoted in the offer shall be used if additional quantities are required.
22	List & quantity of all such equipments and final networking of all panels shall be finalized during detail engineering.
23	Bidders responsibility to provide necessary network switches/equipments/components along with necessary accessories to ensure complete system requirements/operation of supplied package/scope of system.
24	No equipment shall be kept on the floor operation. They may either in closed panel with doors as a standalone or wall mounted. Any type of cable shall be laid through metallic conduit only.
25	Additional module required as a spare shall cater to operate any type of addressable devices indicated in the BOM.



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S. No	Item Description	Quantity [I]	UNITs	REMARKS
[a]	Fire Detection & Alarm System - BOM for Material Code - PY9756217081 [MAIN SUPPLY]			
1	Fire Alarm Panels	5	No's	Each fire alarm panel shall be provided with 16 potential free contacts for tripping of HVAC, ventilation etc. Also refer Note-1,2,3,4,5&9 etc.
2	Repeater Panel (identical to Main Fair alarm panel)	9	No's	Notes 1&2
3	Multisensor Detectors with detector base and back box	1732	No's	
4	Heat detectors with with detector base and back box	102	No's	
5	Air sampling detectors	1	Lot	Refer Note-6
6	Beam Detectors	31	No's	
7	Probe detectors	16	No's	
8	Infrared Detectors with Air Purge Unit	57	No's	
9	Flame Detector	22	No's	
10	1-Input Modules for deluge valves	90	No's	Note-17
11	2-Input 1-output Modules for deluge valves	130	No's	
12	Manual Call Points with mounting back box (Indoor)	318	No's	
13	Manual call points (Outdoor) with mounting back box (IP-65 min.)	116	No's	
14	Manual call points (Flame proof) with mounting back box	14	No's	
15	Hooter cum Strobe with mounting back box	299	No's	
16	Isolator modules with mounting back box	1	Lot	Note-8
17	Control modules for ISG area (Conveyor tripping, etc) with mounting back box (1 Output)	45	No's	
18	Control modules for PEM area (AHU, HVAC, etc) with mounting back box (2 Outputs)	60	No's	
19	Contrl modules for back lit exit signs with mounting back box (1 Output)	325	No's	Control modules for exit sign shall preferably located inside the exit sign.
20	Exit Sign (Back lit)	325	No's	
21	Control Module for Siren with mounting back box	1	No	
22	Response Indicators	261	No's	
23	Siren (10 km) with Siren Control panel	1	No	



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S. No	Item Description	Quantity [1]	UNITs	REMARKS
[a]	Fire Detection & Alarm System - BOM for Material Code - PY9756217081 [MAIN SUPPLY]			
24	Optical LHS Cable for Cable Galleries	1	Lot	Note-15
25	Optical LHS Cable for Coal Conveyors	1	Lot	Note-15
26	Controllers for Optical LHS Cable	1	Lot	Note-16
27	Operator Workstation & Printer along with Graphic software	5	No's	
28	Furniture for Operator Workstation & Printer	5	Sets	
29	UPS for Fire Alarm Panels, Operator Workstation & Printer	3	No's	Refer FDA scheme
30	Mounting Accessories & Erection Hardware for all above items	1	Lot	Note-10
31	Single mode Optical Fiber Cable (for panels and PC networking)	1 Lot (7000 Mtrs.)	Mts	Note-14
32	Erection hardware for cables (Power, Control & Fibre optic)	1	Lot	Note-11
33	Any other misc. items (i.e. network switches, patch cards, LIU etc.) required for establishing the networking between all fire alarm panels, repeater panels, PCs, controllers for optical LHS cable etc shall be included in main offer.	1	Lot	
34	Erection Material for all above items including network switches, patch cards, LIU, cable termination accessories (like cable glands, lugs, etc.) required at bidder supplied system, base frame stand			
(a)	Screw with Rawl Plug	1	Lot	Note -10
(b)	Back Box	1	Lot	Note -10
(c)	Nut Bolt Washer Assembly	1	Lot	Note -10
(d)	Flange for probe detectors	1	Lot	Note -10
(e)	Pipe Clip	1	Lot	Note -10
(f)	GI 'U' Bolt	1	Lot	Note -10
(g)	Saddle Spacer	1	Lot	Note -10
(h)	Nut Bolt Assembly	1	Lot	Note -10
(i)	Anchor Fastner	1	Lot	Note -10
(j)	Hook type Anchor Fastner	1	Lot	Note -10



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S. No	Item Description	Quantity [1]	UNITs	REMARKS
[a]	Fire Detection & Alarm System - BOM for Material Code - PY9756217081 [MAIN SUPPLY]			
(k)	Chain	1	Lot	Note -10
(l)	Any other Erection / Commissioning material required for completeness	1	Lot	Note -10
(m)	Network Switches/equipment /connector with necessary accessories	1	Lot	Note -10
(n)	Metallic conduit for various cables, fitting accessories etc. (Approximate distance 3 Km within control rooms etc)	1	Lot	Note -10



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S. No	Item Description	Quantity (I)	UNITs	REMARKS
[b]	Fire Detection & Alarm System - BOM for Material Code - PY9856217091 [Mandatory Spares]			
1	Multisensor Detectors with detector base and junction box	10 % of each type		
2	Air sampling detector	10 % of each type		
3	Infrared Detectors with Air Purge Unit	10 % of each type		
4	Manual Call Points with mounting back box (Indoor)	5 % of each type		
5	Manual call points (Outdoor)	5 % of each type		
6	Manual call points (Flame proof)	5 % of each type		
7	Heat Detector	10 % of each type		
8	Flame Detector	10 % of each type		
9	FDA panel items			
(a)	Power Supply Module	2 No's for each type & rating		
(b)	CPU Card/Main Control Board	2 No's of each type		
(c)	Network Interface Items	2 No's of each type		
(d)	Zone Control Card/Module	2 No's of each type		
(e)	Audio Control Modules	2 No's of each type		
(f)	Input/Output Control Modules	2 No's of each type		
(g)	Any Other Electronic Cards/Modules used in theSystem	2 No's of each type		
(h)	Battery	2 No's for each type & rating		

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S. No	Item Description	Quantity [1]	UNITs	REMARKS
[c]	Optical LHS cable + controllers - BOM for Material Code - PY9756217022 [MAIN SUPPLY]			
1	Optical LHS Cable for Cable Galleries	1	Lot	Note - 15
2	Optical LHS Cable for Coal Conveyors	1	Lot	Note - 15
3	Controllers for Optical LHS Cable - <i>The optical fibre shall be connected to the detector unit in a single continuous loop to ensure redundancy and full coverage of the protected zones even if the cable is broken/cut/damage at one point.</i>	1	Set	Note - 16
4	Erection Materials for all the above items			
(a)	J-Bolt with two nut assembly	1	Lot	Note - 10
(b)	Rubber Bush	1	Lot	Note - 10
(c)	Any other Erection / Commissioning material required for completeness of system	1	Lot	Note - 10
[g]	Optical LHS cable + controllers - Material Code - PY9856217059 [Mandatory Spares]			
1	Optical LHS Cable for Cable Galleries	10% of total length used in the system		Note - 11
2	Optical LHS Cable for Coal Conveyors	10% of total length used in the system		Note -11
3	Field Mounted Optical/Electronic Items/Accessories for Linear Heat Sensing Cable	2 Nos. for each type		Note - 12

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S. No	Item Description	Quantity [I]	UNITS	REMARKS	
[d]	PLC System(refer Drg. No.: 1-38101-00177for BOM) for Fire Protection System - BOM for Material Code -PY9756217014 [MAIN SUPPLY]				
1	PLC Panel (Dual redundancy for controllers, power supply cards & communication cards)	1	Set		
2	1 No 24" TFT-LCD Operator work station [OWS] with all sets of licensed Softwares + 1 No Laser Printer (Colour) suitable for A4 & A3 size papers + Furniture like tables & chairs as required for above OWS & printer	Refer Drg. No: 1-38316-00177 for BOM	Set		
3	Remote IO Panel with all redundant cables & its accessories required for interfacing with PLC panel	2	No's		
4	UPS with battery		No's		
5	1 No Laptop with all sets of licensed Softwares required for PLC programming [Engg work station]	1	Set		
6	Optical Fiber Cable (for interconnection between PLC and Remote I/O panels for networking)	2000	Mtrs		
7	Erection hardware for cables (Power, Control & Fibre optic)	1	Lot	Note-1	
8	Any other misc. items (i.e. network switches, patch cards, LIU etc.) required for establishing the networking between all fire alarm panels, repeater panels, PCs, controllers for optical LHS cable etc shall be included in main offer.	1	Lot		
[h]	PLC Pkg for Fire Protection System - BOM for Material Code - PY975856217040 [Mandatory Spares]				
1	Key Board & Cursor control devices + 24" LCD TFT Monitors	2	No's		
2	Interface cables with connecting plugs for each type of peripherals & I/O hardware	10	sets		
3	Power Supply Modules - 2 No's for each type or 4 No's; whichever is higher				
	Digital Input modules	2 No's of each type			
	Digital output modules	2 No's of each type			
	Analog input module	2 No's of each type			
	Communication interface modules	2 No's of each type			
	Controller of PLC	2 No's of each type			
	Battery	2 No's of each type & rating			