

	<u>Bill of material</u> <u>[for Main Supply + Mandatory Spares]</u>	Annexure -[A1] of PY 56229
	<u>FDA System + PLC System</u>	Rev 00
	Project: 1X250 MW ROURKELA PP-II EXPANSION	

NOTES ::

1	1) Number of Fire Alarm Panels indicated are minimum requirement based on geographical locations. Any additional FAP, if required, 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 above shall be connected to the Fire Alarm Panels in Class A wiring. b. 30% 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 loops shall be provided in each Fire Alarm panel. However, for Fire Alarm panel in Central Control room(MFAP) spare loops shall be 3 numbers.Spare loops shall be of maximum capacity and shall be part of panel and battery sizing. d.Hard Annunciation window shall be provided on MFAP. e. The Main fire alarm panel shall include a telephone auto dialer into it & can record min. six voice message into auto dialer on field.It shall be possible to program/configure min. six telephone numbers into the auto dailer on field. f. One charger module shall be provided as spare for main fire alarm Panel.
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) Central Control room (b) CHP control room cum MCC-2 (c) AHP compressor cum water pump house (d) ESP Control room (e) Cooling water pump house (f) FGD Control room
4	In addition to the above, repeater panels are to be provided at the following locations: (a) LHP/Gypsum control room (b) CW treatment Plant (c) Admin Building (d) Fire water pump House
5	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.
6	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.
7	List & quantity of all such equipments and final networking of all panels shall be finalized during detail engineering.
8	All erection hardware including back box, lugs, glands, clamps, structural steel, anchor fastner etc. for the above items shall be considered in the offer.
9	BHEL shall supply 70kms of Cu conductor armoured 3C x 1.5sq.mm cable. Accordingly bidder to take care of all the terminations. Erection hardware like cable tags, saddles, saddle bars, lugs, glands, etc for 70 kms of the above cable be considered.
10	Unit rates for addition/deletion of Main and mandatory spares shall be provided by vendor.
11	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. Also, bidder shall provide 2 spare cores which shall be used in case of fault in working cores.
12	Actual quantity of digital LHS cable shall be provided by bidder. Bidder to calculate the exact quantity based on input drawings.Quantity shall be reviewed by BHEL.
13	Modules shall be provided to monitor two inputs (pressure switches/LHS cable) and control one output (SOV) on each deluge valve.
14	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.
15	List and Quantities shall be reviewed during detail engineering.
16	Bidder to refer Annexure-[C] of PY56217 as assessment of erection hardware.
17	Bidder to calculate the exact quantity based on input drawings. Unit rates quoted in the offer shall be used if additional quantities are required.
18	List & quantity of all such equipments and final networking of all panels shall be finalized during detail engineering.
19	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.
20	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.
21	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 - PY97556229004 [MAIN SUPPLY]			
1	Fire Alarm Panels(Main Fire Alarm Panel-MFAP with telephone auto dialler+Area Panels-AP)	6	No's	Each fire alarm panel shall be provided with 50 No.s of potential free contacts for tripping of HVAC, ventilation etc. Refer Note-1,2,3,18,19 Also refer Schematic of FDA Dwg (Annexure-D)
2	Repeater Panel (identical to Main Fair alarm panel)	4	No's	Notes 1,2& 4
3	1 No. of 21" (min.)TFT-LCD Operator work station [OWS] with all sets of licensed Softwares + 1 No. A4 size Black & White Laser Printer + Furniture (table,revolving & rolling chairs) for above work station & printer. [dimensions & aesthetics to be matched with DCS furniture-to be intimated during order execution]	1	set	
4	Multisensor Detectors with detector base and back box	906	No's	
5	Heat Detectors with detector base and back box	45	No's	(grade-1 type as per IS-2189)
6	Beam Detectors	6	No's	
7	Infrared Detectors with inbuilt Air Purge Unit	47	No's	
8	2-Input Modules for deluge valves	44	No's	
9	2-Input 1-output Modules for deluge valves	60	No's	Note-13
10	Manual Call Points with mounting back box (Indoor)	160	No's	
11	Manual call points (Outdoor) with mounting back box (IP-65 min.)	120	No's	
12	Manual call points (Flame proof) with mounting back box	10	No's	
13	Hooter cum Strobe with mounting back box	110	No's	The Hooters which are outdoor type are to be provided with canopies.
14	Isolator modules with mounting back box	1	Lot	Note-6
15	Control modules for ISG area (Conveyor tripping, etc) with mounting back box (2 Output)	45	No's	
16	Control modules for PEM area (AHU, HVAC, etc) with mounting back box (2 Outputs)	30	No's	
17	Exit Sign (Self-Illuminating)	145	No's	
18	Control Module for Siren with mounting back box	1	No.	
19	Monitor modules for pump status signals (4-Input)	8	No's	
20	Control Modules for Inert Gas Extinguishing system (2-Output)	5	No's	
21	Monitor Modules for Inert Gas Extinguishing system(2-Input)	7	No's	
22	Response Indicators	130	No's	
23	Siren (1 km) with Siren Control panel	1	No	
24	Digital LHS Cable for Cable Galleries	12500	Meters	Note-12



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S. No	Item Description	Quantity (I)	UNITs	REMARKS
[a]	Fire Detection & Alarm System - BOM for Material Code - PY97556229004 [MAIN SUPPLY]			
25	Digital LHS Cable for Coal Conveyors	14500	Meters	Note-12
26	Mounting Accessories & Erection Hardware for all above items	1	Lot	Note-8
27	Optical Fiber Cable (for panels and PC networking)	1 Lot (7000 Mtrs.)	Meters	Note-11
28	Erection hardware for cables (Power, Control & Fibre optic)	1	Lot	Note-9
29	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, shall be included in main offer.	1	Lot	
30	GI conduits for network cables	250	Meters	
31	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(if any)			
(a)	Screw with Rawl Plug	1	Lot	Note -15,16
(b)	Back Box	1	Lot	Note -15,16
(c)	Nut Bolt Washer Assembly	1	Lot	Note -15,16
(d)	Flange for probe detectors	1	Lot	Note -15,16
(e)	Pipe Clip	1	Lot	Note -15,16
(f)	GI 'U' Bolt	1	Lot	Note -15,16
(g)	Saddle Spacer	1	Lot	Note -15,16
(h)	Nut Bolt Assembly	1	Lot	Note -15,16
(i)	Anchor Fastner	1	Lot	Note -15,16
(j)	Hook type Anchor Fastner	1	Lot	Note -15,16
(k)	Chain	1	Lot	Note -15,16
(l)	J-Bolt with two nut assembly	1	Lot	Note -15,16
(m)	Rubber Bush	1	Lot	Note -15,16
(n)	Any other Erection / Commissioning material required for completeness of system	1	Lot	Note -15,16
(o)	Network Switches/equipment /connector with necessary accessories	1	Lot	Note -15,16
(p)	Metallic conduit for various cables, fitting accessories etc. (Approximate distance 3 Km within control rooms etc)	1	Lot	Note -15,16



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S. No	Item Description	Quantity (I)	UNITs	REMARKS
[b]	Fire Detection & Alarm System - BOM for Material Code - PY9856229022 [Mandatory Spares]			
1	Multisensor Detectors with detector base and back box	5 nos. each type/rating		
2	Heat Detectors with detector base and back box	5 nos. each type/rating		
3	Beam Detectors	5nos. each type/rating		
4	Electronic card for AP & MFAP	1 no each type		
5	Module for LHS system	1 no each type		
6	IR detector with inbuilt purge unit	2 no.s each type		
7	Hooters cum Strobe with mounting back box	5 no.s each type		
8	Manual call points	5 no.s each type		
9	Monitoring Module	5 no.s each type		
10	Digital LHS Cable for Cable Galleries	1250 meter		
11	Digital LHS Cable for Coal Conveyors	1450 meter		
12	Charger Module for MFAP	1 no.		
	NOTE:The quantity to be reckoned for % indicated shall be rounded off to the next higher whole number.For ex. If % arrived is 5.1,the quantity to be supplied shall be 6.			

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S. No	Item Description	Quantity [I]	UNITs	REMARKS	
[c]	PLC Package for Fire Protection System - BOM for Material Code -PY9756229012[MAIN SUPPLY]				
1	PLC Panel (Dual redundancy for controllers, power supply cards & communication cards with 24V DC power supply system)	1	Set	For details about 24V DC powwer supply system refer cl no-15.12.01 of PLC technical spec.(Annexure-F) for details.	
2	1 No. 22" TFT-LCD Operator work station [OWS] with all sets of licensed Softwares + 1 No A4 size Laser Printer (Colour) + Control desk(to keep monitors at top & computers inside) +Furniture like Industry standard tables ,revolving chairs with wheels as required for above OWS & printer	1	Set	Refer Schematic of FDA Dwg (Annexure-C) & PLC Configuration diagram(Annexure-E)	
3	Graphical interface unit	1	Set	Refer PLC Configuration diagram(Annexure-E)PLC technical spec.(Annexure-F) for details.	
3	Erection hardware for cables (Power, Control & Fibre optic)	1	Lot	Note-A	
4	Any other misc. items (i.e. network switches, patch cards, LIU etc.) required for establishing the following: * 10 nos. of potential free contacts to DCS * Necessary hardware and software to be provided for soft communication between PLC and DCS.	1	Lot		
NOTE-A:BHEL shall supply 5kms of Cu conductor armoured 3C x 1.5sq.mm cable. Accordingly bidder to take care of all the terminations. Erection hardware like cable tags, saddles, saddle bars, lugs, glands, etc for 5 kms of the above cable be considered.					
[d]	PLC Pkg for Fire Protection System - BOM for Material Code - PY9856229030 [Mandatory Spares]				
SI No.	Description	Unit	Qty	Remarks	
1	Electronics modules for each type & model	%	10	10% of (main supply qty.) for each type & model of modules are to be offered.	
2	Power supply unit	%	20	20% or 2nos of each type and model,whichever is more.	
3	Graphical interface unit for each type	No	1		
4	Cooling Fan in PLC cabinet	% or Nos	10 or 2	10% or 2 nos. which ever is higher	
5	TFT monitor	No	1		
6	Printer	No	1		
7	Interconnecting Cables	One run length of each type and size.			
8	Connectors	%	10		
9	Audible devices	% or Nos	10 or 2	20% or 2 nos. which ever is higher	
10	Keyboard	No	1		
11	Relay of each type	%	10		
12	TBs & Fuses	%	20		
NOTE:The quantity to be reckoned for % indicated shall be rounded off to the next higher whole number.For ex. If % arrived is 5.1,the quantity to be supplied shall be 6.					