Corrigendum 01

1. Requirement of below projects are included in tender -

i. Mejia 1x210MW

ii. Mejia 2x250MW

iii. Chandrapura 2x250MW

2. Required Warranty period for projects included in corrigendum 1 is as below -

i. Mejia 1x210MW - 36 months from the date of supply or 12 months from the date of commissioning, whichever is earlier

ii. Mejia 2x250MW - 36 months from the date of supply or 12 months from the date of commissioning, whichever is earlier

iii. Chandrapura 2x250MW - 36 months from the date of supply or 12 months from the date of commissioning, whichever is earlier

3. Tentative delivery schedule for projects included in corrigendum 1 is as below -

i. Mejia 1x210MW – December 2021

ii. Mejia 2x250MW – December 2021

iii. Chandrapura 2x250MW - December 2021

4. Technical specification CE/416/CCTV/DVC-DeNox Rev 00 is revised to technical specification CE/416/CCTV/DVC-DeNox Rev 01 and attached. Technical specification CE/416/CCTV/DVC-DeNox Rev 01 supersedes technical specification CE/416/CCTV/DVC-DeNox Rev 00. Technical specification CE/416/CCTV/DVC-DeNox Rev 01 is applicable for all projects of tender

5. Applicable PBG period for projects included in corrigendum 1 is as below –

“PBG will be applicable for a period of 36 months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10% of the basic value of the purchase order.”

6. Due date of offer submission is extended upto 13.00Hrs on 20.10.2020

PROJECTS:

1) **MEJIA TPS Unit 7&8: 2X500 MW**
2) **KODERMA TPS Unit 1&2: 2X500 MW**
3) **BOKARO 'A' TPS Unit 1: 1X500 MW**
4) **RAGHUNATHPUR TPS Unit 1&2: 2X600 MW**
5) **DURGAPUR TPS Unit 1&2: 2X500 MW**
6) **MEJIA TPS Unit 4: 1x210 MW**
7) **MEJIA TPS Unit 5&6: 2x250 MW**
8) **CHANDRAPUR TPS Unit 7&8: 2X250 MW**

CUSTOMER : M/s DVC

EQUIPMENT : IP CCTV SYSTEM FOR SOFA AREA OF BOILER

PREPARED BY:
AMIT KUMAR SHARMA

APPROVED BY
S K KISAN

REVISION HISTORY SHEET

REV No.	DATE	NATURE OF CHANGE	REASON	PREPARED BY	REVIEWED & APPROVED BY
00	29-09-2020	FIRST ISSUE	---	AKS	SKK
01	08-10-2010	SECOND ISSUE	Addition of three projects in scope of supply & service. Typical network diagram added at pg 27 of 27. The changes are marked in blue	AKS	SKK

SECTION-A : GENERAL INSTRUCTIONS TO BIDDERS:

Introduction: Bidders are required to submit technical offer for supply, installation and commissioning of IP based CCTV system for eight power plants of M/s DVC. All documents against this Tender/Specification shall be submitted in English only.

1. All Bidders must furnish following document for taking up their approval with customer (M/s DVC):

i. Company Profile

ii. List of IP-CCTV system order executed / in hand (especially in power plants, cement plants, petroleum refinery, steel plant, coal mines) in a tabular form mentioning name of project, PO number with date, year of supply, year of full commissioning / handing over, make & model of camera, contact details of user/owner.

iii. Performance certificates / handing over protocols issued by end user for satisfactory working of CCTV system supplied and commissioned.

iv. Unpriced Copies of Purchase order

The credential documents submitted by bidder (as listed above) shall be forwarded as such to customer (M/s DVC) for approval. Technical offer of only such bidders who are approved by M/s DVC will be evaluated for further consideration in the tender. Hence bidders are advised to submit their complete and comprehensive credentials.

2. Makes of IP camera mentioned in later section of this specification are M/s DVC approved makes. However, bidder can quote either approved makes or any other IP camera makes which is meeting PQR criteria. Bidder offering unapproved make of camera should submit filled up form at Annexure-III of this specification. Non submission of filled up form may result in rejection of bid of such bidders. If offered unapproved makes of camera are not approved by customer, then bidder will be given an opportunity to change the make of camera only within customer approved makes of camera along with other associated hardware/software without any price implication.

3. If required during evaluation of Technical offers/bids, bidder should be present at BHEL Electronic Division, Bangalore, for discussions on 3 day's notice. Further in the event of ordering, Bidder shall accompany BHEL representative for discussions with customer / consultant at their works for approval of the system documents.

4. This specification does not prohibit any bidder to submit their offer along with clause wise deviation from the specification. Changes in technical specification / Scope / approved makes etc shall be informed to Participating bidders only.

5. All bidders, irrespective of their existing approval with BHEL / other units of BHEL / DVC, should submit all documents called in this specification.

6. Consolidated Pre-Bid queries must be sought by Bidders through email within 07days from floating the tender. Clarification sought within 5 days from due date of bid submission may not be entertained and replied.

7. Makes of all items mentioned later in this specification are BHEL approved makes. However, Bidder can offer any other makes. All makes will be accepted subject to approval by customer.

SECTION-B: Pre-Qualification Requirements (PQR)

a) Bidder must have a proven experience of supplying and fully commissioning at-least one IP-CCTV system in a large industrial set up like power plants, cement plant, petroleum refinery, steel plant, coal mines, Oil & Gas industry or other industry of similar type.

Following documents must be submitted for meeting this qualifying requirement:

i) Unpriced Purchase Order (PO) or LOI Copies issued in name of bidder.

ii) Signed Bill of Material as part of PO or user approved datasheet having BOM or other user signed document from which camera make/model and VMS make can be ascertained.

iii) Commissioning or handing-over protocol signed by user/owner of the project, for ascertaining that the complete CCTV as per PO has been commissioned and handed over by bidder.

b) The **offered combination of camera and video management software** make shall have at least **six month's satisfactory operation record** as on techno-commercial bid submission due date of this tender in an IP CCTV system installed in a large industrial like power plants, cement plant, petroleum refinery, steel plant, coal mines, Oil & Gas industry or other industry of similar type.

Performance certificate issued by user/owner of project should be submitted. If make of camera and VMS are not mentioned in performance certificate, then other supporting documents (signed by user) to be submitted to ascertain the make of camera & VMS in the referred project.

c) If bidder is based outside India, they shall have authorized representatives in India for support related to documentation, technical support, troubleshooting, Erection, Commissioning and other co-ordination work. Bidder should submit details of Indian representative.

All PQR criteria mentioned above are to be met by bidder in order to qualify for being considered for evaluation of their technical offer.

SECTION- C : TECHNICAL SPECIFICATION

1.00.00 INTENT OF SPECIFICATION

1.01.01 This specification is intended to cover the design, manufacture, assembly, Inspection and testing at Bidder's works; delivery including packaging applicable for the items and all accessories specified later in the scope of supply and as required for safe and trouble free operation of IP CLOSE CIRCUIT TELEVISION (CCTV) SYSTEM

1.01.02 All systems covered herein shall be for the permanent phase of the project and shall include but not be limited to design, supply, installation, erection, commissioning and handing over to M/s DVC the complete system in each project site.

1.01.03 It is not the intent to completely specify all details of design and construction herein. Nevertheless, the system shall conform to high standard of engineering, design and workmanship in all respects and shall be capable of performing satisfactorily in continuous commercial operation under the prevailing environmental condition of the project site.

1.01.04 ABBREVIATIONS

BOQ	- Bill of Quantities
CCB	- Central Control Building
CCTV	- Close Circuit Tele Vision
CCR	- Central Control Room
DCS	- Distributed Control System
LED	- Light Emitting Diode
LOI	- Letter Of Intent
MTTR	- Mean Time To Repair
UCR	- Utilities Control Room
UHF	- Ultra High Frequency
UPS	- Uninterruptible Power Supplies

1.02.00 SCOPE OF WORK AND EXCLUSIONS

GENERAL

1.02.01 The scope of work in this document specifies the technical & contractual requirements for the design, supply, erection, testing and commissioning of CCTV System and all accessories.

1.02.02 Bidder shall be fully responsible for compliance of the system to be supplied in line with the requirements of this specification.

1.02.03 Provisions included in the specification will not be limitative to the scope of work and bidder shall be responsible for supply, installation, erection, commissioning and handing over of complete system.

1.02.04 Bidder shall provide supply/services for any further activities which will improve the quality & performance of the system offered.

1.02.05 **SCOPE OF SUPPLY:** This system is for the Boiler area of the power Plant. The scope of supply in this specification includes Design, fabrication, manufacture and assembly, inspection, shop testing at manufactures works, supply, transportation to site of the entire CCTV System, as specified in this tender document, **on as required basis**, except for items whose quantity are specified later in Bill of Material.

1.02.06 **SCOPE OF SERVICE:**

The scope of service for the system being procured is to be given **on as required basis.** Following service, as minimum, shall be provided by Bidder for equipment & systems supplied under this specification:-

a) Carrying out detail engineering, preparation and submission of all drawings as specified elsewhere in this specification including preparation and submission of area wise bill of materials, layout and erection drawings showing location of all system equipment and components, cable schedule, cable tray/rack and conduit routing.
b) Inspection and testing at Bidder's works as per the approved Quality Assurance Plan.
c) Packing and forwarding of all equipment in suitable packing for each project. The bidder shall be responsible for safe storage of the items inside the packages against weather. It shall be bidder's responsibility to take materials out of the packages for erection and commissioning of the systems.
d) E&C of the CCTV system shall involve deploying labour (skilled and unskilled), supervisory personnel, engineer and also erection tools and tackles, testing equipment, consumables & hardware, transport and storage for timely and efficient execution of the contract work.
e) The complete erection, installation and commissioning of the complete CCTV system will be in bidder scope of services which will include, but not limited, to supply & storage, fixing of camera using suitable camera mount as per site requirement, all type of cable laying/termination, laying of conduits/ cable trays/JBs, digging (2-3ft) & filling back for underground cable laying, civil works, installation and commissioning of all items of CCTV supplied under CCTV system on as required basis.
f) In case of ordering, Bidder will visit Site after ordering to finalise the grouping of cameras and preparation of cable schedule. The cable schedule along with survey report for camera grouping should be submitted along with datasheet.
g) Bidder will, during the time of detail engineering and installation of the quoted system, interact and coordinate with any other agency regarding collection/retrieval of inputs/information/data and all such works shall be under the scope of this Bidder. If necessary, Bidder shall contact the purchaser for clarifications before submission of their Bid.
h) Training to be provided to DVC/BHEL's personnel for maintenance.
i) Establish the specified interfaces and demonstrate operation.
j) Site modification and preparation of "as-built" documentation".
k) Securing certification from relevant authorities, wherever applicable.
l) Project management and scheduling including micro-planning in specific work area and reporting progress periodically.

m) Bidder has to provide the services required for completeness and correctness of the system irrespective of whether it is mentioned in the specification or not.

n) **The complete erection and commissioning of CCTV system shall be done as per availability of fronts in the project and would have to be done spreading over a period of approximately 6 months from delivery of the materials at site. The erection and commissioning would therefore require multiple visit to site for survey, planning, cable schedule preparation, laying of cables, camera mounting, sever installation and commissioning and camera commissioning and bidders should include the same in their offer for E&C**.

o) Redundant 240 VAC UPS feeder from main plant UPS shall be provided at Central Control room for CCTV System. Further distribution and conversion to other voltage level for complete CCTV System shall be suitably done by bidder.

1.02.07 **EXCLUSIONS from scope of services: NIL**

1.03.00 PERFORMANCE GUARANTEE

The Systems / Equipment to be supplied under this specification shall meet the guaranteed performance specified in the enclosed data sheet, specification sheet and technical attachment sheet when operating at the rated / specified conditions. The acceptance of the System / Equipment shall be subject to satisfying these parameters during FAT at Bidder's works and at site installation in complete commissioned condition.

1.04.00 Technical specification of Accessories: Detailed technical specification of CCTV system is provided at Annexure-I. However, the technical specification of accessories are mentioned below:

LED Backlit Monitor:

Viewable size min	As per BOM
Max resolution	1920 x 1080 Pixels.
Contrast ratio	1000:1
Brightness	250 cd /m^2.
Viewing angle	160V / 170H Typical (@ 10:1 CR)
Interface	VGA & DVI D
Power supply	100 to 240 VAC; 50/60Hz.
Other features	Height adjustable stand, pivot, tilt and swivel provisions to be present.

Full Function Keyboard:

Interface	USB 1.1/2.0 Complaint.*(USB extender device for length upto 150 ft to be provided)*
Power	USB interface.
System requirements	Windows 7 or above, Vista, XP, 2000, 2003 Server

Keypad jog dial	Required

Alarm I/O Device:

Input ports	As required
Output ports	As required
Interface	RJ-45, 10/100 mbps Ethernet.
Mounting kit	DIN Rail or Rack Mount.
Compatibility	Should seamlessly integrate with proposed VMS

Network Switch: As per functional requirement of the CCTV system offered and meeting environmental conditions mentioned below:

L2 Distribution and Router: operating temp upto 45Deg C 90% RH

Field (edge) switches at camera end: upto 70Deg C 85% RH

The number of port (Cu and FO) in each switch and quantity of the switch shall be decided by bidder and are to be supplied on as required basis. 20% spare ports of each type shall be available in switches.

Cat 5e UTP Patch Cable: UTP Patch Cable – 3 Meters Length minimum

Cat 5e UTP, 4 Pair Stranded Copper Cable with RJ 45 Connectors.
1000 Mbps – 3 Meters Length.
Stranded, Unshielded 24 AWG
Polycarbonate Plug & Gold over Nickel Contacts
Confirming to EIA/TIA 568B
UL/ETL Verified.

Single Mode Fiber Patch Cable

Fiber Patch Cable - 3 Meters Length

SC-LC or **SC-SC** Duplex(refer BOM), 9/125 microns Single Mode with plastic molded plug type connector. Standard 2.5mm Ceramic ferrule.
Confirming to EIA/TIA 568

Cat5e Patch Panel:

Powder coated steel in 24 port configuration
Should support port identification numbers on the front of the panel.
IDC: Suitable for 22-26 AWG stranded and solid wire compatible with both 110 & Krone punch down tools
The Cat-5e transmission performance should be in compliance with the ANSI/TIA/EIA 568C.2 standard
RoHS Compliant
50 µinches gold on plug contact area , Phosphor bronze with nickel plated IDC Contact

Light Interface Unit (LIU) 24 port:

LIU– 24 Port Rack mount loaded with SC SM Simplex Couplers. Cable entry for six nos. shall be considered for this LIU.

19" Rack Mountable Cabinet
LIU Box Powder Coated Aluminum alloy, Cable grommets should be FR Grade Nylon. Flame retardant plastic.
SC Simplex SM Couplers compatibility to optical fiber 9/125 µm.
Operating temperature of coupler up to 80°C.
LIU qualifies as per ISO/IEC. Couplers – UL listed. RoHS Complaint.

Light Interface Unit (LIU)12 port:

LIU – 12 Port Rack mount loaded with SC SM Simplex Couplers.

19" Rack Mountable Cabinet
LIU Box Powder Coated Aluminum alloy, Cable grommets should be FR Grade Nylon. Flame retardant plastic.
SC Simplex SM Couplers compatibility to optical fiber 9/125 µm.
Operating temperature of coupler up to 80°C.
LIU qualifies as per ISO/IEC. Couplers – UL listed. RoHS Complaint.

Industrial Panel:

Floor standing Panel (Frame)	Basic frame consists of separate height; width and depth channels made from 2mm thick sheet steel and then welded together using a solid steel corner block to provide exceptional rigidity.
Front door	2mm thick single front door, with partial glass Fitted with Nitrile gasket.
Rear door	2mm thick dual rear door with complete steel.
Rear panel	2mm thick, rear panel screw fixed
Side panel	1.6mm thick, panel screw fixed
Top panel	1.6mm thick panel with cable entry facility, fan mounting option. Top Canopy.
Bottom panel	1.6mm thick panel with 3 part gland plate for cable entry
19" rails	Adjustable 19" rails at the front and rear to mount 19" equipment.
Base frame	3mm thick, base frame to rest the cabinet on the floor
Baffle plate	3mm thick, baffle plate / mounting plate to mount the industrial equipment.
Load bearing capacity	Load rating of 1000Kgs
Ingress protection	IP 32
Dimensions • Width • Height • Depth	800 width in mm 2067 height in mm 800 depth in mm (The above dimension are tentative and shall be finalized during detailed engineering)

Material	Steel
Powder coating	Folded end covers / Side Covers Exterior & Interior- Grey White RAL:9002 semi glossy Folded End Covers (Interior and Exterior)- Blue RAL:5012 Semi Glossy (Paint shade are indicative and shall be finalized during detailed engineering)
Accessories • 1U fan tray • Cooling fans • Equipment shelf • Cable manager • Earth continuity kit • Earthing bar	 1.2mm thick tray with 4 fans position (as required) 230v AC, 50 Hz, 90 cfm 1.2mm thick, 1U, 100kg load bearing capacity 1U cable manager for horizontal cable routings Full length vertical managers for vertical cable routings Cables for connecting equipment to main earthing point Vertical and horizontal copper bars for earthing.

Industrial Wall Mount Enclosure:
Industrial Wall Mount Enclosure for housing Edge switch, LIU and Power distribution arrangement to call stations / loudspeaker.

Wall mount rack	Overall structural construction of 1.2mm thickness
Front door	1.2mm thick, front glass door with lock
Rear panel	1.2mm thick, rear wall mounted section hinged to the front section with a pair of 19" rails
Top panel	1.2mm thick panel with cable entry facility, fan mounting option and vents at the front.
Bottom panel	1.2mm thick panel with cable entry facility
19" rails	Adjustable 19" rails at the front to mount 19" equipment.
Load bearing capacity	Load rating of 20Kgs
Dimensions • Width • Height • Depth	 600 width in mm 12U / 6U 500 depth in mm (400mm + 100mm)
Material	Steel
Powder coating	Light grey (RAL 7035)

Accessories • 1U fan tray • Cooling fans • Cantilever shelf • Cable manager • Earth continuity kit	1.2mm thick tray with 2 fans position (as required) 230v AC, 50 Hz, 90 cfm. 1.2mm thick, 1U, 20kg load bearing capacity 1U cable manager for horizontal cable routings Cables for connecting equipment to main earthing point

Mini UPS:

Mini UPS with 30 minutes battery backup for around 10 cameras with 1-2 network switch and media converters.

	Input voltage : 140 – 270 VAC Frequency 47 – 53HZ.
	Output : 1 KVA Rated voltage: 230V AC 50HZ. Power factor : >= 0.7 Overall efficiency >= 85 % Automatic switch over time :< 5 millisecond or better. With overload, short circuit, over & under voltage protections. Battery : SMF

Junction Box

a) Material- min 4mm thick FRP or CRCA
b) Type- Screwed at four corners of door, door gasket shall be synthetic rubber
c) Mounting clamps and accessories: Mounting plate of 2mm thick mild steel to be Provided inside JB, mounting clamps suitable for mounting on walls, columns, structures etc. shall be provided. The brackets, bolts, nuts, screws, glands, SS handle and Lugs required for erection shall be of SS304, included in Bidders scope of supply. M6 earthing to be provided.
d) Protection Type : IP55 of indoor and IP65 for outdoor
e) Grounding: To be provided
f) Colour: To be decided during detailed engineering.

HDPE pipe

The HDPE pipe shall be used for laying OFC and STP cables in outdoor environment. HDPE pipe shall be permanently lubricated type with ISI marked. The internal diameter of the HDPE pipe shall be suitably selected so that 50% free space is maintained during cable drawing. The pipe shall conform to DOT standard GR/CDS-08/02 Nov. 2004 with latest

SPECIAL FITTINGS

All rigid conduit fittings shall conform to requirements of IS: 2667, 1976. Galvanised steel fittings shall be used with steel conduit. All flexible

conduit fittings shall be liquid tight, galvanized steel. The end fitting shall be compatible with the flexible conduit supplied.

1.05.00 DOCUMENTATION

1.05.00.01 Details of documentation to be supplied as part of the System shall be submitted to DVC/BHEL for approval prior to execution of the contract.
1.05.00.02 Each documentation deliverable shall be an integral part of Bidder's Project schedule and shall be identified by date for delivery.
1.05.00.03 Bidder shall supply final approved sets of documentation in soft copies on DVD.

1.05.01.00 **ENGINEERING DESIGN DOCUMENTATION**

Technical Bid shall contain all of following documents:

SL. NO.	DOCUMENT TYPE
1	Data sheets / catalogs of all items
2.	BOM with make & model
3.	Proposed System schematic diagram.
4.	Write up on architecture and operation of proposed system
5.	Sizing calculation of mini UPS and video storage.
6.	Deviation list. If no deviation, then NIL deviation declaration
7	System Integrators participating on behalf of OEM of cameras and VMS must submit Manufacturer Authorisation Letter (MAF) from camera OEM and VMS OEM confirming all of the following: a. OEM's authorization to participate in this tender on their behalf b. That the bidder is their trained system integrator c. That OEM will give all Technical support / troubleshooting assistance during commissioning and operation of the CCTV system. d. That the quoted products are brand new, are not in End of Life list product and support for supply of Spare camera as well as spare parts for 5 years from the date of supply. e. That OEM will continue their technical Support for commissioning, supply of spare / spare part and repair through their other authorized system integrator (SI), if BHEL terminates the contract with present SI or their tie up with present SI ceases till complete commissioning.
8	Clause wise technical compliance indicating each parameter value of w.r.t specification. *A printout of this specification may be taken and "COMPLIED" to be mentioned against each clause with signature and seal on each page. Any deviation should be marked up at relevant clause. Alternatively, bidder can submit clause wise deviation list.*
9	All documents as mentioned in Pre-Qualification Requirement section of this specification.

AS-BUILT DRAWINGS

Upon completion of the final acceptance of the System by DVC/BHEL, all construction drawings shall be updated by Bidder to an as-built status to reflect the equipment and System configurations as actually installed.

1.06.00.00 TESTING

1.06.01.00 FACTORY ACCEPTANCE TEST (FAT)

1.06.01.01 Factory Acceptance Test procedure shall be prepared by Bidder along with Quality Assurance Plan. The document shall be subject to DVC/BHEL's approval.

1.06.01.02 All items that are offered in the BOM shall be duly tested by manufacturer at their factory and test certificate of same shall be furnished to BHEL / DVC for review and approval.

1.06.01.03 The entire CCTV system items (as called in BOM) shall be made available at bidder's work for inspection (FAT) which will include complete integrated test for checking that the equipment offered is meeting the design standards and functional requirements mentioned in this specification. As a minimum, BOM verification, physical verification, integrated test shall be performed on true sample of items selected by BHEL shall be part of FAT. BHEL reserves right to check power ON functionality of entire active components of CCTV system BOM. QAP and FAT procedure shall be subject to DVC/BHEL approval.

1.06.01.04 One month prior to the FAT, Bidder shall submit a test procedure and QAP to BHEL for approval.

1.06.01.05 DVC/BHEL's representative may, at DVC/BHEL's sole discretion, attend the FAT. In this event, Bidder shall ensure all tests are carried out in the presence of DVC/BHEL's personnel. If DVC/BHEL declines to attend the FAT, Bidder shall carry out these tests and submit the results to DVC/BHEL for review.

1.06.01.06 Factory Acceptance Tests (FATs) result shall be documented and the test results shall be submitted to DVC/BHEL prior to clearance by DVC/BHEL for dispatch.

1.07.01.01 **COMMISSIONING**

1.07.01.01 Bidder is responsible for delivering a fully functional equipment that meets all the requirements of the Specification and applicable standards.

1.07.01.02 The Commissioning processes will demonstrate the above to DVC/BHEL, before handing over of the System.

1.09.01.03 System Commissioning shall comprise of a number of different activities culminating in the acceptance of the operational System by DVC/BHEL. These activities are detailed in the following sections.

1.07.01.04 Bidder shall provide all necessary test equipment required to carry out the Commissioning and acceptance testing.

1.08.01.00 CLEANING, PROTECTION AND PAINTING

1.08.01.01 All equipment shall be shipped in properly cleaned condition. All the equipment shall be thoroughly cleaned to remove mill scales, rust etc. and properly painted with anti rust primer, where applicable

1.08.01.02 Some of the equipment and accessories, after arrival at site, are likely to be in storage for long periods before they are taken up for erection. Bidder may provide adequate protection for preventing damage due to corrosion, dust / dirt ingress, ageing etc.

1.08.01.03 Plugs shall be provided at cable entry holes/adapters to avoid entry of dust and foreign particles. Paper cap will not be acceptable.

1.09.00 IDENTIFICATION, MARKING, PACKING AND STORING

1.09.01 Each equipment shall be individually packed, tagged & protected.

1.09.02 Inscription on equipment (labels) shall be in English.

1.09.03 Packing must be such to protect all goods from possible impacts and foreign matters; moreover, it must limit the influence of both the climate and the environment, and be suitable for the kind of shipping provided for.

1.09.04 In packing the equipment and accessories, all necessary precautions will have to be taken to avoid any damage during transport and delivery.

1.09.05 All items supplied shall be packed for long term storage under the climatic conditions prevailing at the site in a weather proof container. Small items shall be packed in sealed transparent plastic bags with desiccator packs as necessary. Each item shall be clearly marked with its description, purpose and plant designation code as applicable. When more than one item is packed in a single case a general description of the contents is to be shown on the outside of each case and a detailed list enclosed. All cases and other packages must be suitably marked and numbered for identification purposes.

1.10.00 SHIPMENT

1.10.01 Bidder shall be responsible for ensuring that all equipment are carefully and/or suitably packed for shipment, so that they arrive at site in good condition and remain so during storage at site. Before dispatch, all exposed surface shall be protected by applying anti rust primer (two coats) and suitable cover shall be provided for the equipment to be supplied.

1.10.02 Bidder will be responsible for all damages due to improper packing of the goods for shipment and shall replace all such damaged items without cost implication to BHEL

1.11.00 DISCREPANCIES

In case of discrepancies between the technical requirements and other applicable Engineering Standards, Materials System Specifications, Standard Drawings, or industry standards, codes, and forms shall be resolved in writing by Bidder before bid submission. **Bidder is also advised to discuss on any clarification required before submitting their offer to avoid any ambiguity/dispute later on.** In case of any discrepancy in specification / parameter mentioned in this purchase specification, the stringent between the two shall be considered and offered.

It shall be the responsibility of Bidder to determine and comply with the statutory regulation (i.e. city, state, national, provincial, etc. codes or ordinances) which will apply in the location where the item is to be installed. Mandatory regulations cannot be superseded by this specification.

List of approved makes of CCTV system components:

CCTV cameras and joystick
M/S BOSCH
M/S PELCO
SERVER AND WORK STATION, KEYBOARD & MOUSE
IBM/LENOVO
HP/COMPAQ
DELL
SIEMENS FUJITSU
MINI UPS
HITACHI HIREL (GANDHINAGAR)
APC (BANGALORE)
EMERSON/TATA LIEBERT (MUMBAI)
APLAB (India)
DB POWER (PUNE / SATARA)
DELTA (GURGAON)
NETWORK SWITCH
CISCO
BROCADE (FOUNDARY)
HIRSHMANN (GERMANY)
GARRET (USA)
NETGEAR
JUNIPER (USA)
ALLIED TELESYS
42U PANEL / WALL MOUNTABLE PANELS
PYROTECH (UDAIPUR)
RITTAL (BANGALORE)
PENTAIR TECHNICAL PRODUCTS INDIA PVT LTS (HOFFMAN)- BANGALORE
IL (KOTA)
SCHNEIDER ELECTRIC (BANGALORE)
FO cable:
Birla Erricson
Aksh Fibre
Finolex (Pune / Goa)
Corning Cable System, USA
HFCL, Goa
R&M, Switzerland
D-Link
Molex, UK
Power cable
M/S ADVANCE CABLES TECHNOLOGIES, BANGALORE
M/S APAR INDUSTRIES, BANGALORE

M/S CMI Ltd, FARIDABAD
M/S CORDS CABLES, RAJASTHAN
M/S DELTON CABLES,FARIDABAD
M/S ELKAY TELELINKS LTD FARIDABAD, HARYANA
M/S GEMSCAB INDUSTRIES LTD, BHIWADI
M/S GOVIND CABLE INDUSTRIES, GHAZIABAD
M/S GOYOLENE FIBRES ,MUMBAI
M/S GUPTA POWER INFRASTRUCTURE LTD. BHUBANESWAR
M/S KEC INTERNATIONAL LTD, BANGALORE
M/S KEI INDUSTRIES LTD ,CHENNAI
M/S MANSFIELD CABLES COMPANY LTD. NOIDA,
M/S PARAMOUNT CABLES,ALWAR
M/S POLYCAB,DAMAN
M/S RAVIN CABLES, PUNE
M/S RJ INDUSTRIAL CORPORATION, UTTRAKHAND
M/s SBEE CABLES, BANGALORE
M/S SPECIAL CABLES LTD, NEW DELHI
M/S SPM POWER & TELECOM PVT LTD, HYDERABAD
M/s SRIRAM CABLES LTD, NEW DELHI
M/S SURAJCABLES, DELHI
M/S SUYOG ELECTRICALS LTD. BARODA
M/S T C COMMUNICATION PVT. LTD, NEW DELHI
M/S TEMPSENS INSTRUMENTS PVT LTD, UDAIPUR
M/S THERMO CABLES, HYDERABAD
M/S TORRENT CABLES, NADIAD
M/S UDEY PYRO CABLES, VADODARA
M/S ULTRACAB (INDIA) PVT LTD, GUJARAT
CAT 5e UTP CABLE / PATCH CABLE/PATCH PANEL/LIU:
AMP / DIGILINK / D-LINK / SYSTEMAX
COMPUTER TABLE / CHAIR
ADARSHA CONTROL / COSMOS MEDIA / FEATHERLITE / GAUTIER / GODREJ / HARMONY / LAMPERTZ / OTS OFFICE / PAN OFFICE / PYROTECH
SINGLE MODE FIBER PATCH CABLE / SC PIGTAIL SIMPLEX
Avaya / Belden /D-Link / Digilink / Tyco
SINGLE MODE MEDIA CONVERTER
Avaya / Belden /D-Link / Digilink / Tyco/ CTC Union
1. For all other items whose make are not mentioned above, the offered make shall be reputed and must have been supplied & commissioned earlier. 2. Camera and Joystick should be of same make. If make of offered VMS is not same as camera, then letter of from both camera & VMS OEMs to be submitted for compatibility of VMS & camera/joystick. 4. Bidders offering unapproved makes of camera shall submit filled up form at Annexure-III from camera OEM. Non submission of filled up form may result in rejection.

ANNEXURE-I

1.00.00 DESIGN AND TECHNICAL REQUIREMENTS

1.01.00 The CCTV system shall be able to provide surveillance of SOFA area of boiler. The exact mounting locations of camera shall be decided during commissioning.

The CCTV system shall be designed as a standalone IP based network architecture. System shall use video signals from cameras, process the video signals for viewing on monitors at different locations and simultaneously record all the video streams using MPEG4 or better compression technique. Joystick and mouse-keyboard controllers shall be used for Pan, Tilt, Zoom and other functions of desired cameras.

1.02.00 The complete system for each boiler shall have 8nos of PTZ Cameras, camera management cum database servers or OWS (for management of cameras and storage of video of all camera for 21 days), Monitors, key board, joysticks, set of network switches (L2/L3) to control and integrate the system. **There are total 8 projects (location) having one or two boiler in each project.**

~~1.03.00 The CCTV system for each project shall be linked to existing analog CCTV system in these projects.~~

1.04.00 The camera management cum database servers or OWS shall offer both video stream management, video stream storage management. These shall also manage and store configuration information/database for the whole system. Recording frame rate & resolution in respect of individual camera shall be programmable. It shall be possible to view and record at different resolutions and frame rates and this shall be individually programmable on every camera. It shall be possible to take back-up of system configuration and database on removable media i.e CD/DVD etc. and restoring the same if required.

1.05.00 System shall ensure that once recorded, video cannot be altered.

1.06.00 Camera server shall be provided with sufficient storage space to store recordings of all cameras at 25 FPS, 4CIF for a period of 21 days or more using necessary compression techniques. All recordings shall have camera ID, Location, Date and time of recording. Bidder to submit sizing calculation of video for each zone.

1.09.00 Video Management software shall allow the clients seamless operation of all cameras. Software shall allow the client applications to interact with all the camera/database servers or OWS simultaneously and allow simultaneous display of live video/recorded video regardless of the zone in which the client is connected.

1.10.00 It shall be possible to view, record, search and replay simultaneously without affecting performance of the system.

1.11.00 The system operation would be of covering the complete view of the areas with pan / tilt, zoom, propositioning of the cameras and with programmability to monitor any camera on any monitor either manually or automatically in a defined switching. The offered components like camera, switches, JB etc which are to be mounted in SOFA area of the boiler shall be suitable for installation and continuous operation in boiler area of Thermal power plant whether the aspects are indicated in this specification or not. The system supplied shall be complete in all respects for safe and reliable performance.

1.12.00 The system shall be able to accept potential free contacts from other system and use the same for predefined actions (like zoom/pan/tilt of cameras, bringing out pre-defined views

on predefined monitors etc.) This feature shall be mainly used for linking fire related signals. This functionality can also be provided as a part of camera or through separate network compatible alarm system.

2.00.00 DETAILED DESCRIPTION OF THE SYSTEM COMPONENTS:

2.01.00 **Application Software for Video Monitoring, Recording & Management.**

2.01.01 The application software shall be used to display, store, control & manage the entire surveillance system. The software shall be capable of handling 20 % additional cameras over and above the number of cameras specified in each zone.

2.01.02 It shall be possible to control all cameras i.e PTZ , auto/manual focus, selection of presets, video tour selection etc. The software shall support flexible 1/2/4 windows split screen display mode or scroll mode on the display monitors for live video.

2.01.03 It shall be possible to define priority based camera control rights for each camera or a group of cameras. The users shall be defined on a hierarchical basis with a minimum of three levels. A higher priority user can take control of camera being controlled by a lower priority user. In addition the user shall have facility to request access of any camera and if the existing situation permits the user shall be to control the camera.

2.01.04 The software shall be programmable with at least 50 sequences that can run independently of each other in either forward or reverse direction. The sequences shall support simultaneous switching on multiple image panes or monitors. The sequences shall also support camera prepositions for each camera on each sequence step.

2.01.05 The system administrator shall have rights to add/delete/configure users with rights. It shall be possible to view the rights of each user or the cameras which can be viewed/controlled by each user. It shall also be possible to add/delete cameras, configure cameras, assign priorities to users, configure alarm monitors etc. It shall also be possible to configure user groups with different rights and assign users to user groups. The system shall support unified log-in through out the system and it shall be possible for any user to log-in from any location/client and access cameras/recordings and other features as permissible depending on his rights assigned to his log-in.

2.01.06 The system shall have different recording modes i.e continuous, manual, programmed, event activated etc. on date, time camera wise. It shall be possible to configure each mode using user friendly tools. It shall be possible to search and replay the recorded video date, time, camera, event wise.

2.01.07 The system shall include on screen display for time-date, camera number/camera ID, and status information. The system shall have provision for logging through printer output port, which shall provide permanent record of system status showing time and date of changes such as: incoming alarms, acknowledgement of alarms, loading of sequences, user log-on to key board, transfer of system tables and sequence, video loss messages, and a power up reset message, thus hard copy of the system's configuration tables and sequences can be obtained.

2.01.08 The system shall have alarm interface capability. When an alarm occurs in the Security or Control System Server, the live video output of the camera associated with that alarm shall be switched directly to a predefined monitor/monitors. The user shall be able to acknowledge the alarm to clear the monitor using the numeric keypad or mouse. Cameras that are directed to such pre-defined monitors will not be removed from the queue unless explicitly cleared by the

operator. It shall be possible to create a queue of such pre-defined monitors to manage multiple alarm views simultaneously. The system shall maintain a single alarm stack for the complete system, which shall include events received from other system, or events detected by video analytics, network loss, video loss etc. It shall be possible to assign priorities to alarms. System shall maintain audit trail for alarms and actions taken by users in response to alarm shall be recorded and made available for audit.

2.01.09 The software for clients shall preferably work on a browser based system .This will allow any authorized user to display any video (live/recorded) of any camera on the monitor with associated controls. It shall be possible to play back recorded video at different speeds i.e 1/4X to 16 X. The system shall support multiple live video on single monitor in different configurations like 1,2,4 etc.

2.01.10 It shall be possible to retrieve recorded video without much delay for any date/time interval.

2.01.12 The system shall be interfaced to LVS display system of each unit. All the related hardware and software shall be provided by the Bidder. The unit level system shall be connected to at least one no monitor, one no. key board and requisite number of servers and cameras. The system shall also have the following provisions.

Software shall also provide the ability to monitor system status events. Systems alarms, switching functions, sequence events, keyboard actions, and video loss information.

2.01.13 The system shall be able to provide complete system diagnostics.

2.01.14 Not used

2.01.15 The software shall support video loss and network loss alarm feature.

2.01.16 It is a requirement that all user actions on the system Operator Station be recorded in a log file along with the Security System or Control System's actions. User actions include: Interventions such as manual recording and configuration setting changes

Cameras viewed / Video replayed / Video exported / Cameras pan/tilt/zoomed and preset switching

This log must also contain a history of the status of the system components. It shall list the status of all cameras, servers and other system components including when they were disabled or failed. This log shall be maintained for a minimum period of 21 days.

2.02.00 **Cameras:**

2.02.01 All the cameras shall be colour, suitable for day and night surveillance and network compatible. Further all the cameras shall be high speed integrated PTZ dome type. The cameras shall be rugged, full performance color cameras. These cameras shall provide high resolution and high sensitivity suitable for operation in boiler area of power plant, both in natural and artificial sighted areas. Detailed technical specification is given below.

Image Device	1/2.8-1/3" Progressive scan CMOS
Lens	4.45-4.7 /89-94.0 mm focal length
Optical Zoom	20x or better
Digital Zoom	12x or better

Number of Pixels/ Effective resolution	1920X1080 (Full HD)/2 MP at 25/30 IPS
Video compression	H.264 Main Profile/High profile
Sensitivity(at 6dB)	Colour mode 0.6 lux , B/W mode 0.04lux @30IRE, F1.6
Horizontal Angle of view	55.4 deg(wide)- 3.5 deg (Tele) minimum
Focus	Auto with Manual Override
Iris Range	F1.6-F2.9
Iris Control	Auto with Manual Override
Back Light Compensation	Required
White Balance	Automatic with mode selection options
Electronic Shutter	1/50 to 1/10000 Auto
S/N Ratio	>50dB
Audio	Full Duplex or 2-way
Automatic Gain Compensation	Up to 18 dB
Power Supply	As per manufacturer's standard to be arranged by bidder
Gain Control	Auto/Off
Day/Night selection	Auto On-Off
IR cut-filter	Yes
Protocols	IPV4/IPV6,RTP, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP,SNMP or equivalent
Security	Password protection
Auto Resume after Power Failure	Yes
Multiple Streams Operating resolution	H.264 /H.264 & H.264/Motion JPEG Primary stream – 1920X1080 at 25/30 FPS & other minimum 720X576 at 25/30FPS
Analytics	Motion detection & Tamper alarm
PoE supply IEEE 802.3af compliant or better	Yes
Rate Control	VBR/CBR
Other Features	On screen Menu display, contour correction and contrast compensation control
	Automatic Picture Enhancement to give a balanced picture where there is too much/too little light
	Synchronization selection for line lock and free running
	Minimum 2 Alarm I/Ps & 1 alarm output
PTZ Specifications	
Pan	360 Deg Continuous
Tilt	90 deg
Manual Tilt Speed	0.1 deg/sec to 45 deg/sec
Manual Pan Speed	0.1 deg/sec to 80 deg/sec
Preset Positions	Minimum 256
Preset Pan Speed	280 deg/sec min
Preset Tilt Speed	160 deg/sec min

2.03.00 Camera Housing& Mount

2.03.01 All the cameras and accessories are to be housed in Weather Proof IP 65 environmental housing made of aluminum and Sun shroud. The housing, with heater and blower installed, shall provide protection for camera/lens assemblies in the ambient temperature range of - 0 deg. C to 50 deg. C.

2.03.02 The camera mount should be of the same make as that of camera and suitable for the model no. offered as specified by the manufacturer and should be an integrated unit

2.03.03 **Keyboard & Joystick**

Keyboard shall have full function used for system control and programming for selection of various Network switches, camera/database servers, camera functions including pan, tilt and zoom lens controls and shall be ergonomically designed. Joystick shall be provided for achieving all control functions.

2.03.04 **Work Station**

For hardware specification please refer specification of operator work stations is provided at later section of this specification. However RAM and hard disk/storage memory shall be sized to meet functional requirement as stipulated in this section.

2.04.00 Network Switch:

All the network switches shall be of high quality and shall be sized to meet the functional requirements as specified. All the network switches shall be provided with twenty percent (20%) spare ports. The location of placing network switches shall be decided during detail engineering and shall be subject to approval of employer. Distribution switch shall be suitable for operation upto 45Deg C if placed in AC room near OWS. Field switches which will be mounted at outdoor locations should be suitable for operation upto 70Deg C.

3.00.00 CABLES:

3.01.00 All Cables being supplied shall be armoured FRLS PVC sheathed cables for use in CCTV and shall conform to latest edition of Indian/International standards. Fiber optic cables are to be provided wherever required. The remaining cables can be as per CCTV supplier's standard. All the cables and the hardware required for powering the system are also in the scope of Bidder. All cables required for interfacing alarm contact inputs (to be provided by employer) to CCTV system are also in scope of Bidder.

FIBER OPTIC CABLE

Optic Fiber cable shall be 4/8/12 core, galvanised corrugated steel taped armoured, fully water blocked with dielectric central member for outdoor/ indoor application so as to prevent any physical damage. The cable shall have multiple single-mode or multimode fibre on as required basis so as to avoid the usage of any repeaters. The core and cladding diameter shall be 9 +/- 1 micrometer and 125 +/- 1 micrometer respectively. The outer sheath shall have Flame Retardant, UV resistant properties and are to be identified with the manufacturer's name, year of manufacturer, progressive automatic sequential on-line marking of length in meters at every meter on outer sheath.

The cable core shall have suitable characteristics and strengthening for prevention of damage during pulling viz. Steel central member, Loose buffer tube design, 4 fibers per buffer tube (minimum), Interstices and buffer tubes duly filled with Thixotropic jelly etc. The cable shall be suitable for a maximum tensile force of 2000 N during installation, and once installed, a tensile force of 1000 N minimum. The compressive strength of cable shall be 3000 N minimum& crush resistance 4000 N minimum. The operating temperature shall be –20 deg. C to 70 deg.C

All testing of the fiber optic cable being supplied shall be as per the relevant IEC, EIA and other international standards. Bidder to ensure that minimum 100% cores are kept as spares in all types of optical fibre cables. Cables shall be suitable for laying in conduits. Spliced / Repaired cables are not acceptable. Penetration of water resistance and impact resistance shall be as per IEC standard

4.00.00 Server and Workstations- Following is minimum configuration to be offered, However, Bidder shall offer configuration as required by their offered system.

Sl. No.	Features	**Servers**	**Operator workstations**
1.	Processor	64 bit/32 bit (Dual CPU for Station LAN Server)	64 bit/32 bit
2.	Memory	2 GB RAM upgradable to 4 GB	1 GB RAM upgradable to 4 GB
3.	Hard Disk	3 x 1 TB Ultra wide SAS, Hot swappable	1 TB ultra wide SCSI
4.	Monitor (color)	Min 20" TFT Flat Monitor with non-interfaced refresh rate min. 75 Hz.	Min 20" TFT Flat Monitor with non-interfaced refresh rate min. 75 Hz.
5.	RAID	SAS-channels, hardware RAID level 5 implemented	
6.	Redundant hot swappable power-supply	1set	
7.	Removable bulk storage drive (DVD DAT)	500 GB (minimum)	
8.	Removable Bulk Storage Media for above.	16x or higher	
9.	DVD R/W		32x or higher
11.	Keyboard	ASCII	ASCII
12.	Pointing Device	Optical Mouse	Optical Mouse
13.	Additional general purpose software	Comprehensive disk maintenance utility for disk clean sweep/ crash guad/antivirus etc.	

		Projects with 16nos of camera per project						
Sl. No.	ITEM	UoM	Mejia 2x500MW	Koderma 2x500MW	Raghu'pur 2x500MW	Durgapur 2x500MW	Mejia 2x250MW	Chandrapur 2x250MW	TOTAL QTY
1	VMS software of adequate capacity including 10% spare capacity	LOT	1	1	1	1	1	1	6
2a	OWS/server/NVR suitable for **18nos** (incl 2 spare) of cameras	SET	1	1	1	1	1	1	6
2b	Monitor min 32" TFT	Nos	1	1	1	1	1	1	6
2c	Keyboard, mouse and Joystick	Nos	1	1	1	1	1	1	6
2d	Mini UPS suitable for 30min backup to Server/OWS/NVR offered	Set	1	1	1	1	1	1	6
3	LVS connection: OWS without monitor (with Keyboard, Joystick, license, table & chair) OR Any other solution for LVS connection	SET	1	1	1	1	1	1	6
4	PTZ Dome Color Camera with suitable mount & power supply	NOS	16	16	16	16	16	16	96
5	**Network Switch**								
5a	L2 Distribution Switch with suitable no of each types of ports required with 20% spare ports of each type	Lot	1	1	1	1	1	1	6
5b	Edge Switch with suitable no of each types of ports on as required basis with 20% spare ports of each type	Lot	1	1	1	1	1	1	6
6	Cat6 shielded Twisted Pair Cable (STP)	Lot	1	1	1	1	1	1	6
7	4F Single Mode Armoured OFC Cable	Lot	1	1	1	1	1	1	6
8	3C 1.5sqmm Armoured Power Cable	Lot	1	1	1	1	1	1	6
9	Armoured signal cable for alarm connection								
10	Pair of Single Mode Industrial grade Media Converters -10/100 MBPS suitable for approx 500mtrs distance (cameras to switch)	Lot	1	1	1	1	1	1	6
11	GI conduits with couplers & connectors to lay CAT6 and OFC in outdoor	Lot	1	1	1	1	1	1	6
12	Industrial Panel	LOT	1	1	1	1	1	1	6
13	Industrial Wall Mount Enclosure or JB of IP65 rating for mounting network switches, media converter, MCBs, TBs etc at camera end	LOT	1	1	1	1	1	1	6
14	Anti-Virus Software, for all the server/OWS	SET	1	1	1	1	1	1	6
15	**Miscellaneous items**								
a	Fiber optic accessories like Fiber Patch Cable, LIUs, Pigtails etc required for completion of the splicing and termination of FOC	LOT	1	1	1	1	1	1	6
b	Cat-6 cable accessories like UTP Patch Cable, patch panel, etc for termination of all CAT5e cables.	LOT	1	1	1	1	1	1	6
c	Electrical items such as TBs, MCBs, cable coverings, cable managers, RJ45 connectors, etc.	LOT	1	1	1	1	1	1	6
d	Mechanical items such as G/C channels, DIN Rail, JBs, cable glands, lugs, mounting accessories for camera/JB/enclosure etc	LOT	1	1	1	1	1	1	6
16	Alarm I/O module	LOT	1	1	1	1	1	1	6
17	Computer table and chair for placing OWS with monitor	LOT	1	1	1	1	1	1	6
18	Any other item mentioned in technical specification or required for completion of CCTV system but not covered in the BOM.	LOT	1	1	1	1	1	1	6
19	Suitable Packing for each project for storing CCTV components	LOT	1	1	1	1	1	1	6
20	Erection, Installation, commissioning and handing over of complete CCTV system package on as required basis.	LOT	1	1	1	1	1	1	6

		Project with 8nos of camera per project			
Sl. No.	ITEM	UoM	Bokaro 1x500MW	Mejia 1x210MW	TOTAL QTY
1	VMS software of adequate capacity including 10% spare capacity	LOT	1	1	2
2a	OWS/server/NVR suitable for **18nos** (incl 2 spare) of cameras	SET			
2a	OWS/server/NVR suitable for **10nos** (incl 2 spare) of cameras	SET	1	1	2
2b	Monitor min 32" TFT	Nos	1	1	2
2c	Keyboard, mouse and Joystick	Nos	1	1	2
2d	Mini UPS suitable for 30min backup to Server/OWS/NVR offered	Set	1	1	2
3	LVS connection: OWS without monitor (with Keyboard, Joystick, license, table & chair) OR Any other solution for LVS connection	SET	1	1	2
4	PTZ Dome Color Camera with suitable mount & power supply	NOS	8	8	16
5	**Network Switch**				
5a	L2 Distribution Switch with suitable no of each types of ports required with 20% spare ports of each type	Lot	1	1	2
5b	Edge Switch with suitable no of each types of ports on as required basis with 20% spare ports of each type	Lot	1	1	2
6	Cat6 shielded Twisted Pair Cable (STP)	Lot	1	1	2
7	4F Single Mode Armoured OFC Cable	Lot	1	1	2
8	3C 1.5sqmm Armoured Power Cable	Lot	1	1	2
9	Armoured signal cable for alarm connection				
10	Pair of Single Mode Industrial grade Media Converters -10/100 MBPS suitable for approx 500mtrs distance (cameras to switch)	Lot	1	1	2
11	GI conduits with couplers & connectors to lay CAT6 and OFC in outdoor	Lot	1	1	2
12	Industrial Panel	LOT	1	1	2
13	Industrial Wall Mount Enclosure or JB of IP65 rating for mounting network switches, media converter, MCBs, TBs etc at camera end	LOT	1	1	2
14	Anti-Virus Software, for all the server/OWS	SET	1	1	2
15	**Miscellaneous items**	LOT			
a	Fiber optic accessories like Fiber Patch Cable, LIUs, Pigtails etc required for completion of the splicing and termination of FOC		1	1	2
b	Cat-6 cable accessories like UTP Patch Cable, patch panel, etc for termination of all CAT5e cables.		1	1	2
c	Electrical items such as TBs, MCBs, cable coverings, cable managers, RJ45 connectors, etc.		1	1	2
d	Mechanical items such as G/C channels, DIN Rail, JBs, cable glands, lugs, mounting accessories for camera/JB/enclosure etc		1	1	2
16	Alarm I/O module	LOT	1	1	2
17	Computer table and chair for placing OWS with monitor	LOT	1	1	2
18	Any other item mentioned in technical specification or required for completion of CCTV system but not covered in the BOM.	LOT	1	1	2
19	Suitable Packing for each project for storing CCTV components	LOT	1	1	2
20	Erection, Installation, commissioning and handing over of complete CCTV system package on as required basis	LOT	1	1	2

Price break up for each of the above items should be submitted in the price bid, separately for 16 camera system and 8 camera system

DAMODAR VALLEY CORPORATION
ELECTRICITY DEPARTMENT
DVC TOWERS, VIP Road, Kolkata-54

Doc No/EDCON/QC &I/Kol/Sub-Vendor Pro/ 01 Date: 19.09.19

Requirement for approval of vendor/sub-supplier under DR category:

Name of vendor/sub-supplier is to be proposed by EPC (Main) contractor along with the following documents:-

1) About vendor/sub-supplier to be proposed-
   a) Proposed sub-supplier/vendor's name and works, factories, branch addresses, total organizational strength (Engineering, Manufacturing, Quality, Commercial, service after sales & others)
   b) Nature of Company: Whether it is a Proprietary/Partnership/Private Limited/Public Limited.
   c) Brief specification of the items for which approval is requested.
   d) Details of manufacturing license for the product for which approval is asked for. Indicate approval/certification by any National/International standards/agencies if applicable.
   e) Indicate details of foreign collaborations if any.
   f) Contact person details along with Telephone Nos., Fax Nos., E-mail ID.

4) Record of past supply by the sub-supplier/vendor for the same type of materials for which approval is asked to any Govt/Govt. Under takings/PSUs/ Reputed Private Company within last Seven years. Records must be of such type:-
   a) Copy of Purchase Order issued from Govt./Govt Undertakings/PSUs / Reputed Private Co.
   b) Copy of performance certificate issued by any Govt./Govt Undertakings/PSUs/Reputed Private Co.
   c) Other documents like approved Engineering Documents, approved MQP, MDCC, Inspection Reports etc. as required for justification towards sub-vendor approval.

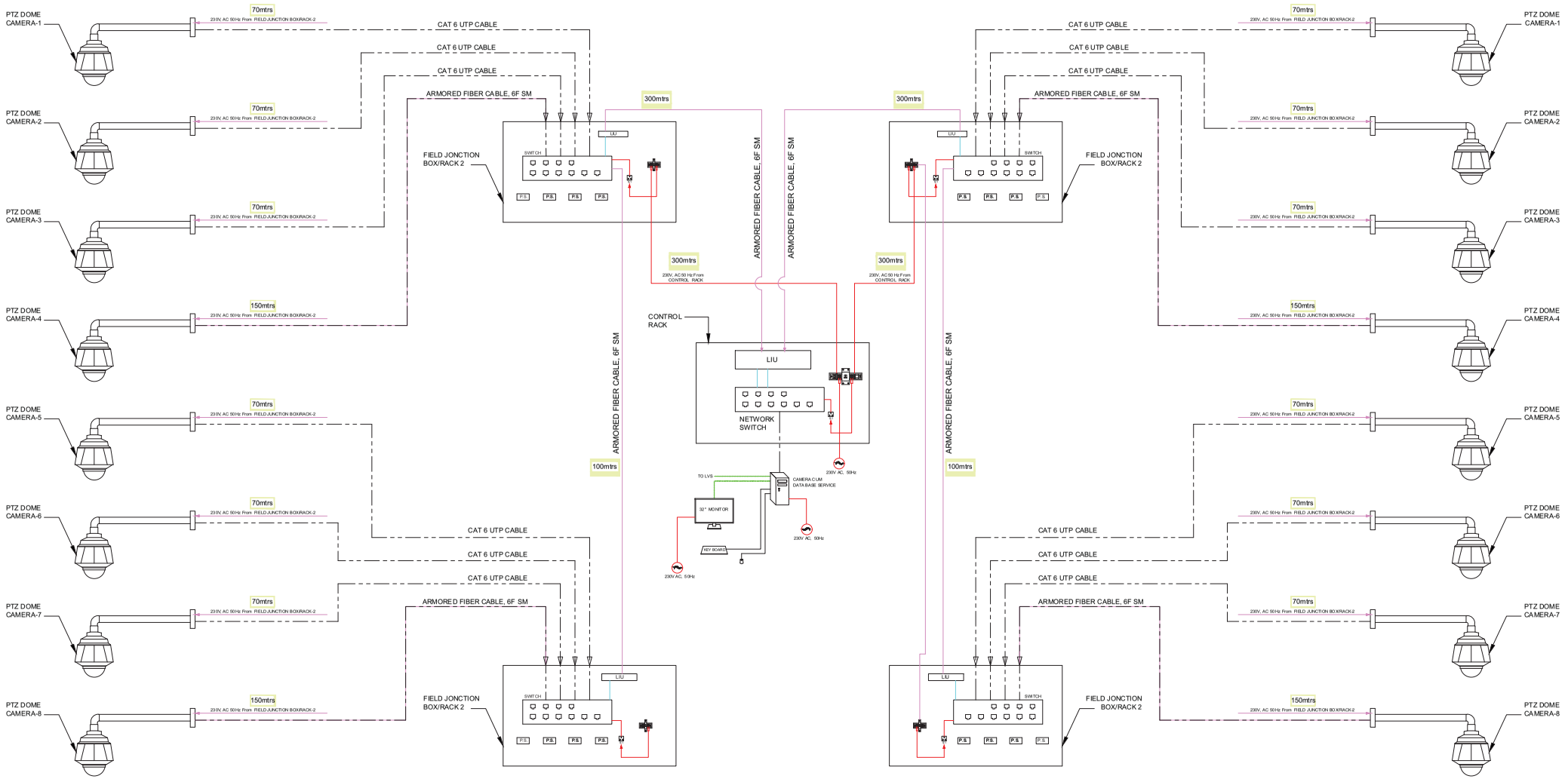
5) Type test report for the same type of materials for which approval is asked for from any Govt. Govt. approved Laboratory/ other reputed Institutions within last five years (or as per the NIT Requirements) – if required.

6) Financial capability: (i) Net Worth (ii) Annual Turnover & Profit for last three years (iii) Limit of credit facility available from bank with documentary evidence

7) Whether the sub-supplier/vendor has the following in-house facility (Enclose Documentary evidence) or otherwise (Detail to be provided):
   a) Design:
   b) Research & Development:
   c) Manufacturing/Production:
   d) Quality Control/Inspection:
   e) Testing Lab/Testing facilities:
   f) If in-house testing / quality control facilities are not available, indicate source of testing / quality control with relevant details.
8) Compliance of Statuary / regulatory / pollution norms wherever applicable with documentary evidence.
9) Other documents if needed during reviewing the submission.

Note:

1) DVC may visit the factory/works/office of the sub-supplier/vendor to verify the above submitted details. The documents asked to verify the above information have to be provided by the sub-supplier/vendor duly reviewed by main supplier to DVC.
2) If the Legal documents like Certificate of Incorporation/ Manufacturing license, Statutory Documents etc. cannot be verified from the original then the Notarization for the same will be required.



Typical network diagram for tender purpose ONLY.
The distances mentioned and the configuration shown in this drawing may be different than actual site requirement for each project. Bidder should consider and offer all items called in lots in BOM (Annexure-II) on as required basis only.

LEGENDS:-
- ARMORED POWER CABLE 3x1.5mm
- CONNECTING CABLE
- CAT 6 UTP CABLE
- ARMORED FIBER CABLE, 6F SM
- FIBER PATCH CORD