

Bharat Heavy Electricals Ltd.,
Electronics Division,
Mysore Road, Bangalore – 560 026

Tender Document for " Supply and E&C support services for CCTV SYSTEM , PERIMETER INTRUSION DETECTION SYSTEM , ACCESS CONTROL SYSTEM & PATROL GUARD SYSTEM FOR RRVUNL SURATGARH 2X660MW project . "

TENDER REFERENCE DOC	HDC0000445
TENDER DOCUMENT AVAILABLE FROM	REFER E-PROCUREMENT SYSTEM WEBSITE
LAST DATE AND TIME FOR SUBMISSION OF TENDER	REFER E-PROCUREMENT SYSTEM WEBSITE
DATE AND TIME FOR TENDER OPENING	REFER E-PROCUREMENT SYSTEM WEBSITE
SUBMISSION OF TENDER	Bidder to submit tender in E-procurement site : https://bheleps.buyjunction.in/ . Refer instructions give in tender document for offer submission of bid in E-procurement site. Service provider: M-junction

This Tender Document Contains documents as per below index:

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Contact Person at BHEL: CHANDRAIAH H D , SENIOR MANAGER/PURCHASE(CE-MM-PR) Ph: 080-26998674

REQUEST FOR QUOTATION

	BHARAT HEAVY ELECTRICALS LIMITED Electronics Division PB No. 2606, Mysore Road Bangalore - 560026 INDIA	RFQ NUMBER: HDC0000445 RFQ DATE : 21.JUN.2016	Due Date As per Open tender due date VENUE : NEW ENGG. BLDG
MMI:PU:RF:003			

	(for all correspondence) Purchase Executive : CHANDRAIAH H D Phone : 26998674 Fax : 00918026989217 E-mail: chandraiah@bheledn.co.in
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Please submit your lowest quotation subject to our terms and conditions attached for the material mentioned below. The quotation must be enclosed in a sealed envelope / Fax superscribed with RFQ no.and due date, should reach us on or before the due date by **13.00** hours IST and will be opened on the same day at **13.30** hours at the venue mentioned above.

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	PR0900000137 IP CCTV System IP BASED CLOSE CIRCUIT TELEVISION-SUPPLY E&C SUPPORT FOR CCTV SYSTEM, PERIMETER INTRUSION DETECTION SYSTEM,ACCESS CONTROL SYSTEM & PATROL GUARD SYSTEM FOR RRVUNL SURATGHAR PROJECT	1	ST	1	20.10.2016

Total Number of Items - 1

Please note that the tender will be opened in the presence of the bidders or his authorised representatives (maximum two per organisation) who choose to be present with authorisation letters. Refer annexure for the terms and conditions.

Preference will be given to vendors who accepts our standard payment terms.

Please specify Terms of delivery, Excise duty, sales tax, Ex-BHEL, Ex-works surcharge, Insurance,P&F, Freight and other taxes very clearly .


For evaluation,exchange rate(TT selling rate of SBI) as on scheduled date of tender opening (Part-I bid incase of two part bid) shall be considered.

The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected.The list of banned firms is available on BHEL web site www.bhel.com , **Note: Please refer BHEL NIT for commercial Terms & condition.**

- i). This is only RFQ not an order.
- ii). In all correspondence quote RFQ No. & due date.
- iii). In Quotation BHEL material code / RFQ Sl. No. should be mentioned clearly.
- iv). Quotation Envelope / Fax not superscribed with RFQ No.and due date is liable for rejection.
- v). Quotation should remain valid for a minimum period of 120 days from date of PQC bid opening date.
- vi). In case of non-receipt of Quotation or regret letter for 3 consecutive RFQs you are liable to be removed from our vendors list.
- vii). All Prices should be written in words and numbers.
- viii). Excise Chapter Heading should be mentioned for all items where VAT is applicable .

Note: Please refer BHEL NIT for commercial Terms & condition.

For and On behalf of BHEL.

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REVISION HISTORY SHEET

REV No.	DATE	NATURE OF CHANGE	REASON	PREPARED BY	REVIEWED BY
00	09.06.2016	FIRST ISSUE	---	AKS	KRS

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SECTION- A

GENERAL INSTRUCTIONS TO BIDDERS:

Introduction: Bidders are required to submit technical offer for supply, installation and commissioning of IP based CCTV system, Perimeter intrusion detection system, Access Control System and Patrol Guard Monitoring System for RRVUNL Suratgarh 2x660MW project. All required documents against this Tender/Specification shall be submitted in English only.

Pre-qualification requirements (PQR) are clearly mentioned in Section-B of this Specification. In case Bidder does not meet Pre-qualification requirements, their offer will be summarily rejected and Bidder's Technical offers will not be evaluated.

1. Submission of documents:


- a. Documents listed in section-B of this specification for meeting Pre Qualification Requirements (PQR) should be submitted in a separate cover with "section-B- Pre Qualification " written on cover.
- b. Technical offer / proposal as per section-C of this specification should be submitted in a separate cover with "Section-C technical offer" written on cover.

2. Evaluation methodology:


- a. Bidder's PQR document cover only will be opened first for review and evaluation by BHEL. In case the bidders offer do not meet the PQR, then corresponding techno-commercial offer will not be considered for further evaluation in the tender. Technical bids of those bidders who meet PQR shall be opened for review and further consideration.
 - b. Bidders declared qualified for meeting Pre Qualification Requirements mentioned in section B and are presently not registered with BHEL EDN Bangalore for supplying the charger system, shall be informed by email to submit online BHEL vendor registration form at www.bhel.com.
 - c. Bidders declared qualified for meeting Pre Qualification Requirements mentioned in section B but are not in RRVUNL approved vendor list for the project, their credential documents as provided by bidder under section-B shall be forwarded to M/s RRVUNL for approval. If RRVUNL does not such vendors proposed for approval, their offer will be technically rejected and shall not be considered for further process for procurement.
3. If required during evaluation of PQR and Technical offers/bids, vendor should be present at BHEL Electronic Division, Bangalore, for discussions. Further in the event of order, during approval of the Vendor documents by Customer, Vendor shall accompany BHEL representative for discussions with customer / consultant.
 4. This specification does not prohibit any vendor to submit their offer along with clause wise deviation from the specification. Changes in technical specification / Scope etc shall be informed to Participating bidders only.


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<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information contained in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly, in any manner detrimental to the interest of the company </p>		<p style="text-align: center;"><u>SECTION- B</u></p> <p style="text-align: center;"><u>Pre-Qualification Requirements (PQR)</u></p> <p>a) The bidder should be a manufacturer (OEM) / system Integrator and have designed, engineered, supplied and commissioned CCTV system & Perimeter Intrusion detection system to power plants / process industry. Following supporting documents shall be submitted for meeting above requirements:</p> <ol style="list-style-type: none"> i) Purchase Order Copies along with Bill of material. ii) Commissioning completion MOM or letter by user to substantiate commissioning of CCTV system. iii) Bidder may also submit Performance certificates issued by end customer, if available. iv) List of past supplies in tabular form mentioning name of project, year of supply, year of commissioning, make etc <p>b) Original Equipment Manufacturers (OEM) of CCTV system, Perimeter Intrusion detection system and Access Control System based outside India, who are submitting offer for this tender, shall have authorized representatives in India for support related to Documentation, technical support, troubleshooting, Erection, Commissioning and other co-ordination work. Letter from OEM detailing Indian representative details should be provided. OEM to also furnish an undertaking letter that in case of change in Indian representative / agent, OEM shall continue to support for commissioning and troubleshooting the supplies made through this tender.</p> <p>c) BHEL shall issue call for service / commissioning with maximum 15 days' notice. Bidder to submit undertaking letter for agreeing to visit project sites within above notice period.</p> <p>d) System Integrators participating on behalf of OEM of cameras of CCTV system , OEM of cameras of Perimeter Intrusion detection system and OEM of Access Control System should submit Manufacturer Authorisation Letter from OEM for their consent to participate in this tender and for further support / troubleshooting during commissioning and operation of the systems.</p> <p>e) Make of camera, Network Attached storage, Video Management system and network Switches offered in CCTV system should have been supplied and commissioned in power/process industry. Bidder should submit supporting document substantiating this requirement.</p>		

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		<ol style="list-style-type: none"> The erection, installation and commissioning of the complete CCTV system, perimeter intruder detection system, Access Control system will be in bidder scope of services except specific exclusion mentioned in the specification. This will include storage in weather proof container, fixing of camera using suitable camera mount (as per site requirement), all cable laying & termination, fixing of conduits/cable tray, installation and commissioning of all items supplied under CCTV system, perimeter intruder detection system, Access Control system on as required basis. The cables of the systems will be generally laid on the cable tray available in the plant. For end termination, the cable may be required to be laid inside conduits. Also, the FO and power cable along perimeter shall be laid 2feet underground (10000mtrs) perimeter cable for camera inside HDPE conduit. Underground cabling is also to be done where ever cable tray is not available. 		

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2.04.04 GENERAL CODES AND STANDARDS

2.04.04.01 Materials shall be designed, manufactured and tested in accordance with the latest applicable Indian Standards (IS), IEC and other internationally recognized standard except where modified and/or supplemented by this specification. Performance figures quoted shall be guaranteed within the tolerance permitted by relevant standards. In case of failure of the equipment to meet the guarantee, the equipment may be liable for rejection.

2.04.04.02 It shall be Bidder's responsibility to comply with the requirements of all Codes and Standards which are applicable to meet the Specification.

2.04.04.03 The following Codes and Standards form a part of the Specification:

ANSI	: American National Standards Institute
BS	: British Standards
CCITT	: Consultative Committee on Telephone and Telegraph
EIA	: Electronics Industry Association
FM	: Factory Mutual
IEC	: International Electrotechnical Commission
IEEE	: Institute of Electrical and Electronic Engineering
IS	: Indian Standard
ISA	: Instrument Society of America
ISO	: International Standards Organisation
ITU	: International Telecommunication Union
NEC	: National Electrical code
NEMA	: National Electrical Manufacturers Association

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI S3.5 Methods for the Calculation of the Speech Intelligibility Index

BRITISH STANDARDS (BS)

1	BS EN 60268-5 : 2003	Sound system equipment, Loudspeakers.
2	BS EN 6840-13 : 1998	Sound system equipment. Listening tests on Loudspeakers.
3	BS 6840-14: 1987	Sound system equipment. Guide for circular and elliptical Loudspeakers; outer frame diameters and mounting dimensions.
4	BS 8473 :2006+A1:2008	Intruder and hold-up alarm systems. Management of false alarms. Code of practice.

INDIAN STANDARD (IS)

IS-5	Colour for ready mixed paints and enamels.
IS-694	PVC insulated cables for working voltages upto and including 1100 V.
IS-1554	PVC insulated electric cables.
IS-2147	Degree of protection provided by enclosures for low voltage switchgear and control gear.
IS-3961	Recommended current ratings for cables.
IS-3975	Mild steel wires, formed wires and tapes for armoring of cables.
IS-5831	PVC insulation and sheath of electric cables.



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IS-7741	Specification for Loudspeakers.
IS-8130	Conductors for insulated electric cables and flexible cords.
IS-9302	Characteristics and methods of measurements for sound system equipment.
IS-9537	Conduits for electrical installations.
IS-10426	Specification for public address amplifiers.
IS-10918	Vented type nickel cadmium batteries.

INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

IEC 60268-5 Ed.3.1 EN:2007	Sound System Equipment – Part 5: loudspeakers.
IEC 60529	Classification of Degrees of Protection Provided by Enclosures (IP Code)
IEC 60839-5-2 ed. 1.0 b:1991	Alarm Systems Part 5 Requirements for alarm transmission systems.
IEC 61000	(All Parts) Electromagnetic Compatibility (EMC)

The edition or revision of the Codes and Standards shall be the edition current at the date of the Contract.

2.05.00 PROJECT INFORMATION


- 2.05.01 Environment specified as 'Indoor' shall be air-conditioned, where mentioned, having temperature between 20-25 degrees C and RH of about 40%. Outdoor location shall follow 'site condition' data.
- 2.05.02 All outdoor equipment shall be exposed to high humidity & oil/water vapor, coal dust and fly ash laden environment, vibration and electromagnetic interference generally encountered in similar industrial environment.
- 2.05.03 All outdoor equipment shall be mechanically or environmentally protect with sunshade or canopy wherever necessary.


Project Location: The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. All relevant site data /information as may be necessary shall have to be obtained /collected by the Bidder.

2.06.00 Technical specification of Accessories

a) Information Outlet (I/O) of CAT-6 UTP

Information outlet shall be RJ45 Toolless Information Outlet of CAT-6 UTP with white colour RJ-45 transparent shuttered socket outlets (modular) with all accessories including label holder, both side colour marking as per EIA/TIA standards. conformity of standards like ISO/IEC ed. 2, EN 50173 and EIA/TIA 568 for fast connection socket and it takes fast tool-less connectors with contact marking by double colour code 568A and B and numbers connectors with insulation displacement contact (IDC). It has the possibility of min. 5 times re-wiring in the event of error, multidirectional cable entry.

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<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information contained in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly, in any manner detrimental to the interest of the company </p>		<p>b) Face Plate (Plastic Modular Face Plate white in Colour 1 Module) Face Plate shall be white modular plate type front plate with accessories for 1/2 nos RJ 45 data outlet, but excluding RJ45 data outlet complete in all respect with grid plate, screws, MS box etc with connections as required.</p> <p>c) Rack End Patch Cord-1 mtr Blue in Colour The Patch Cord shall be of CAT6 UTP PATCH CORD - 1 MTR (3 feet) Blue Colour factory moulded as per EIA/TIA standrads.</p> <p>d) End User Site Patch Cord-2 mtr Blue in Colour End User Site Patch Cord shall be of CAT6 UTP LSC2 PATCH CORD - 2 MTR (7 feet) Blue Colour factory moulded as per EIA/TIA standrads.</p> <p>e) 19" rackmountable 24 Port CAT6 UTP Patch Panel Loaded This item shall be 24 port PATCH PANEL RJ-45 Loaded CAT-6 UTP 19" rackmountable patch panel preferbaly with front loaded 6 in a blocks as per EIA/TIA standrads, modular in mechanism.</p> <p>f) 9U cabinet 504.65X600X500 (HXWXD) - Wall Mounting Rack 9U cabinet shall be of Width (mm)-600, Depth (mm) - 500, Approx.Net Wt (kg) - 20, CRCA 'D' Grade thickness (mm) - 1.2, Powder Colour for Cabinet - RAL9002, Glass - 4mm Toughened Tinted Glass Door, Accessories:, Cooling Fan (230V A/C 90 CFM) - 2 Nos, PDU 230VAC - 1 No, Cable Manager Metal- 2 Nos, Mounting Hardware (20 sets of M6 screws,washer,cage nuts (nickel coated)) - 1 No, Wall Screws (4 sets of 2" screws, washer, rubber grommet (nickel coated)) - 1 No, Door Lock - 1 No, Front Metal Band -1 No. In the rack there must be maintained 1U = 1.75 inches space. (All Stand alone rack and server should have 6A, 220V socket link with UPS line)</p> <p>g) Splicing Tray It shall be Modular Splice Tray Cassette for pigtails 12 fibre capacity.</p> <p>h) 19" LCS2 Modular Liu-Fiber Optic Drawer-24 Port The item shall be Modular fiber optic drawer modular 19"(LIU) 24 port - FIBER OPTIC DRAWER loaded with SC Pigtail - 9/125 µm for 6 Cr. OFC armoured LCS2 and adapter for 6 OFC SM LCS2 without Blanking plate. The LIU should either be suitable for outdoor mounting/fixing or suitable enclosure for outdoor mounting to be provided</p>		
		<p>i) 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</p> <p>j) RIGID STEEL CONDUIT Conduits up to and including 25 mm shall be of 16 SWG and conduits above 25 mm shall be of 14 SWG. Minimum size of conduits shall be 19 mm.Each piece of conduit shall be straight, free from blister and other defects and covered with capped bushing at both ends. All rigid conduit couplings and elbows shall be hot dip galvanized rigid mild steel in accordance with IS:9537 Part-I (1980) and Part-II(1981). The conduit interior and exterior surfaces shall have a</p>		

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		<p>2.0701.00ENGINEERING DESIGN DOCUMENTATION</p> <p>10.01.01 Bidder will produce drawings of complete system to be submitted to Owner for approval, indicating upon each the following :</p> <ul style="list-style-type: none"> a) Overall dimensional drawing of system cabinet, console and its accessories. Block diagram of system offered with a brief write-up on operation including hook-up arrangement with existing system. b) Data sheets. c) Bill of Materials. d) Typical general arrangement drawings of various handset and speaker stations. e) Schematic diagram of each type of station. f) Mounting details. g) Cable connection diagram for various type of stations, clearly indicating cable size, number of pairs/cores etc. 		



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h) Total power consumption details.

i) Heat load details of panel equipments.

j) Technical leaflets on each piece of equipment viz handset, speaker etc.

2.07.01.02 The Systems Design Manual shall contain all relevant information pertaining to the design and operation of the delivered equipment.

2.07.01.03 This is intended to provide Owner with an understanding of the operational and design parameters of the equipment and to resolve System operational problems.

2.07.01.04 This documentation shall typically include the following items, presented in a Systems Design Manual:

Equipment design calculations and selection basis.

Equipment construction and assembly drawings.

Parts list and drawings with manufacturer's identification codes.

Systems connection diagrams.

Accessories list and drawings with manufacturer's identification codes.

2.07.02.01 OPERATION & MAINTENANCE DRAWINGS AND DOCUMENTATION

2.07.02.01 The O&M Drawings and Documentation shall typically include the following items:


- Assembly drawings.
- Parts list and drawings with manufacturer's identification codes.
- Accessories list and drawings with manufacturer's identification codes.
- O&M schedules.
- Maintenance guidelines including lapping instructions.
- Troubleshooting guides.


2.07.02.02 The O&M manuals shall be submitted in the form of handy, hard bound books which can be easily handled and transported to site.


2.07.03.00 DRAWING/ DOCUMENT SUBMISSION REQUIREMENTS

2.07.03.01 Bid shall contain at least the following documents:

SL. NO.	DOCUMENT TYPE
1.	Supply Document list
2.	Supply program
3	Data sheets
4.	Technical specifications & relevant drawings
5.	Start-up, Mandatory and Recommended spare parts
6.	List of Tools and Tackle
7.	Proposed System schematic diagram.
8.	Write up on architecture and operation of proposed system
9.	BILL OF MATERIALS with make and model no. of equipment
10.	Power requirement (capacity of FCBC and SMF battery)
11.	Quality Control Plan
12	Declaration stating the quoted products are brand new, Products are not in End of Life category list, Spares availability for 5 years from the date of main supply

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		13	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.	
<p>2.07.04 AS-BUILT DRAWINGS</p> <p>Upon completion of the final acceptance of the System by Owner, all construction drawings shall be updated by Bidder to an as-built status to reflect the equipment and System configurations as actually installed.</p>				
<p>2.08.00.00 TESTING</p> <p>2.08.01.00FACTORY ACCEPTANCE TEST (FAT)</p> <p>2.08.01.01 Factory Acceptance Test procedure shall be prepared by Bidder along with Quality Assurance Plan. The document shall be subject to Owner’s approval.</p> <p>2.08.01.02 All System equipment shall be tested in the factory prior to clearance for shipping. The FAT shall include individual equipment tests and integrated under fully assembled condition.</p> <p>2.08.01.03 The FAT shall demonstrate adherence that the equipment meets the design standards and functional compliance.</p> <p>2.08.01.04 One (1) month prior to the FAT, Bidder shall submit a test procedure to Owner for approval. Duration of FAT at manufacturer’s works shall be atleast two weeks.</p> <p>2.08.01.05 Owner’s representative may, at Owner’s sole discretion, attend the FAT. In this event, Bidder shall ensure all tests are carried out in the presence of Owner’s personnel. If Owner declines to attend the FAT, Bidder shall carry out these tests and submit the results to Owner for review.</p> <p>2.08.01.06 Factory Acceptance Tests (FATs) shall be documented with the results obtained and the success or failure of the test. The test results shall be submitted to Owner prior to clearance of the FAT and authority by Owner is given to ship.</p>				
<p>2.09.01.01COMMISSIONING</p> <p>2.09.01.01 Bidder is responsible for delivering a fully functional equipment that meets all the requirements of the Specification and applicable standards.</p> <p>2.09.01.02 The Commissioning processes will demonstrate the above to Owner, before handing over of the System.</p> <p>2.09.01.03 System Commissioning shall comprise of a number of different activities culminating in the acceptance of the operational System by Owner. These activities are detailed in the following sections.</p> <p>2.09.01.04 Bidder shall provide all necessary test equipment required to carry out the Commissioning and acceptance testing.</p>				
<p>2.09.02 SITE ACCEPTANCE TEST (SAT)</p> <p>2.09.02.01 Site acceptance test shall be performed by Bidder to verify the full operational functionality of the System.</p> <p>2.09.02.02 Four weeks prior to the SAT Bidder shall submit a test procedure to Owner for approval.</p>				

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COPYRIGHT AND CONFIDENTIAL The information contained in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly, in any manner detrimental to the interest of the company		<p>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.</p> <p>In case of any discrepancy in specification / parameter mentioned in this purchase specification, the stringent between the two shall be considered and offered.</p> <p>16.00.00 GENERAL TERMS AND CONDITIONS</p> <ol style="list-style-type: none"> Considering possibilities of change in requirement, i.e. addition & deletion of quantities for individual project BOM at a later date after system design finalization, the bidder must clearly quote unit price as well as lot price for all items for indisputable calculations of lot prices in case of revised quantities later. Each item is to be offered on per unit basis including commissioning spares, cables, type test charges etc. In case of quantity change, unit rates shall be applicable. BHEL, however reserves the right to split the order with OEM as imported order (for duty benefit) & Interconnecting cables , erection & commissioning & accessories (JB's, plug & socket, cable glands etc) as indigenous order through different suppliers (Authorized dealers of OEM) for above projects based on lowest worked out tenders. Even if BHEL places split orders, the total overall responsibility of system integration at site for satisfactory operation lies with corresponding indigenous bidder only. However individually each bidder as applicable has to offer separate lump sum unit rates for erection, Commissioning and handing over of system. 		

ANNEXURE –1
TECHNICAL REQUIREMENTS

SPEC.NO. TCE.5750A-H-500-001	TATA CONSULTING ENGINEERS LIMITED	VOLUME V SECTION: TABLE16
Package: EPC	RRVUNL, 2 x 660 MW,Super-Critical TPS,Stage-V, Unit # 7 & 8 at Suratgarh, Rajasthan INSTRUMENTATION AND CONTROL EQUIPMENT PLANT SECURITY AND SURVEILLANCE SYSTEM(PSS)	SHEET 1 OF 23
<p>1.0 PLANT SECURITY AND SURVEILLANCE SYSTEM (PSS)</p> <p>1.1 PSS-GENERAL</p> <p>1.1.1 A complete integrated plant security and surveillance system (PSS) complete with all hardware and software as required shall be provided. The system to be provided shall include all necessary hardware, software, firmware, interfaces and accessories, required for implementing a fully functional PSS system for a modern power generation utility. Bidder's offered PSS shall include but not limited to the details specified in subsequent paragraphs.</p> <p>1.1.2 The design of the security& surveillance system shall take into account the potential security risks to the power plant.</p> <p>1.1.3 Plant security and surveillance system (PSS) shall be an integrated system comprising the following systems/facilities:</p> <ul style="list-style-type: none"> (a) Perimeter Intruder Detection System (b) CCTV Monitoring of Plant area/ equipment (c) Security card access system (d) Patrol Guard Monitoring System <p>1.1.4 For the purpose of perimeter detection and CCTV monitoring, a security room shall be provided in the service building. This room will house PCs, Network controllers, Video recorders, monitors, PTZ units and other associated accessories.</p> <p>1.1.5 IP Camera based system shall be provided for perimeter detection system and CCTV monitoring. All cameras for perimeter detection system and CCTV system shall be connected to Industrial Ethernet switches through single mode Fibre Optic cable for transferring camera video signals. Ethernet switches will then be connected to a network controller to a separate high speed LAN that shall handle high capacity video files.</p> <p>1.1.6 RTUs shall be suitable for accepting different types of field devices e.g fixed cameras, dome cameras, card access readers etc.</p> <p>1.1.7 All camera images shall be continuously recorded. System offered shall allow to record and hold camera images for a minimum period of 90 days. Facility for transferring camera images to separate network data storage devices and play back facility of the same shall be provided.</p> <p>1.1.8 Camera image monitoring and viewing facility shall be provided at both service security</p>		
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<p>room and at CCR. While from CCR only CCTV monitoring will be carried out, both perimeter detection and CCTV viewing shall be possible from security room.</p> <p>1.1.9 Alarm & Display monitors shall be provided as specified in end of this section.</p> <p>1.1.10 COLOUR GRAPHIC VIDEO DISPLAY UNIT</p> <p>22" colour LCD monitor with mouse / track ball facility shall be provided. Resolution shall be 1280 x 1024 pixels minimum. Number of characters per line shall be minimum 80 and number of lines per display page shall be minimum 48. Total number of characters shall be minimum 256 graphic characters + ASCII. Minimum Sixteen (16) colours shall be provided. Anti-reflection feature shall be provided. The VDUs shall be of table top mounting type. All VDU's shall have dedicated keyboard. .</p> <p>1.1.11 Camera Mounting:</p> <p>The camera shall be mounted such that a clear, unobstructed view of the scene to be observed is generated. The mounting bracket / pole and accessories shall be designed to ensure a proper, rigid support to the camera. The installation shall be done in a manner that the camera and its components / accessories are easily accessible for maintenance and there is minimal risk of accidental damage.</p> <p>1.1.12 Camera Enclosure:</p> <p>1.1.12.1 Enclosure shall be suitable for accommodating the fixed cameras. The enclosure shall feature a removable / sliding / hinged type cover to allow easy access to the camera, lens and the camera mounting platform. The camera mounting platform shall be constructed from rigid non-conducting material. It shall be removable and shall allow for adjustment of height. Glands shall be provided for easy installation of the power and video cables. An optically clear and distortion free viewing window shall be provided. The housing shall be suitable for obstruction free viewing. The enclosure shall have a powder coated or epoxy finish. Mounting brackets to suit the location of installation shall be supplied. The protection class of these enclosures shall be IP 65 or better.</p> <p>1.1.12.2 For outdoor camera enclosures in addition to the requirements detailed above, thermostatically controlled heater, blower with filter and sun shroud shall be provided.</p>		
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<p>1.2 Perimeter Intruder Detection System</p> <p>1.2.1 Perimeter intruder detection system shall meet following requirements:</p> <ul style="list-style-type: none"> (a) The detection system shall be installed along the entire length of fence/ boundary of the power plant and all entry& exit gates on the boundary. The system shall be capable of providing 24 hour continuous surveillance by means of a network of video cameras. (b) The intruder detection system shall be based on video motion detection technology. (c) The system shall be able to identify and distinguish between whether the intruder is a human being or an animal. (d) Upon detection of intrusion, suitable alarms to be raised to security guards and corresponding camera image shall be displayed on a high resolution dedicated alarm screen. (e) The system shall allow for the adjusting the sensitivity to reduce false alarms. (f) When there is no intrusion, the camera images shall be displayed and recorded on a multiplexed basis. (g) The intruder detection system shall be PC based system and will employ a hard disk based recording system. <p>1.2.2 The intruder detection system shall be complete in all respect and generally will comprise the following:</p> <ul style="list-style-type: none"> (a) Fixed cameras. (b) Video motion detection software (c) Necessary camera poles, camera housing and related accessories, necessary civil & masonry works. (d) The number of cameras and associated accessories including the cables, shall be arrived at based on the perimeter length and contour considering maximum viewing length of 150 meters. Attached plot plan shall be used for arriving at the number of cameras. 		
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<div>1.2.3 Perimeter camera requirements are as following:</div> <div><div>(a) As many cameras as required for proper coverage of total perimeter length shall be provided. However, individual camera coverage shall not exceed 150 meter distance along the perimeter length.</div><div>(b) Cameras provided with auto IRIS lens, low lux density suitable for functioning in darkness (night shot capability) and Infra red illuminator.</div><div>(c) Cameras provided with UPS power supply.</div><div>(d) Cameras shall be provided with IP65 enclosure.</div><div>(e) Camera mounting pole height shall not be less than 6 meters.</div></div> <div>1.2.4 Server/Client Workstation & Peripherals</div> <table><tr><th>Sl.No</th><th>Description</th><th>Unit</th><th>Qty</th></tr><tr><td>1</td><td>Redundant Server with 22" monitor, keyboard & mouse with necessary software licenses</td><td>No</td><td>1</td></tr><tr><td>2</td><td>Client Work Station with 22" monitor, keyboard & mouse with necessary software licenses</td><td>No</td><td>1</td></tr><tr><td>3</td><td>Network Array Storage System for Equipment CCTV</td><td>No</td><td>1</td></tr><tr><td>4</td><td>40" TFT LCD monitor for Large video display</td><td>No</td><td>2</td></tr><tr><td>5</td><td>A3 color laser printer</td><td>No</td><td>1</td></tr></table> <div>1.3. CCTV Monitoring System</div> <div>1.3.1 Purpose of CCTV monitoring system shall be to meet the following :</div> <div><div>(a) To provide the plant operators with an overview of the important plant equipment so that they can ascertain that there are no obvious mechanical problems.</div><div>(b) To provide another angle on any intruder that may have broken into the premises. Security personnel may then if required manually track the intruder.</div></div> <div>1.3.2 CCTV monitoring system shall meet the following requirements:</div> <div><div>(a) Simultaneous remote centralised surveillance from both CCR & also from</div></div>			Sl.No	Description	Unit	Qty	1	Redundant Server with 22" monitor, keyboard & mouse with necessary software licenses	No	1	2	Client Work Station with 22" monitor, keyboard & mouse with necessary software licenses	No	1	3	Network Array Storage System for Equipment CCTV	No	1	4	40" TFT LCD monitor for Large video display	No	2	5	A3 color laser printer	No	1
Sl.No	Description	Unit	Qty																							
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VOLUME V
SECTION: TABLE16

Package: EPC

RRVUNL, 2 x 660 MW,Super-Critical TPS,Stage-V,
Unit # 7 & 8 at Suratgarh, Rajasthan
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SYSTEM(PSS)

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security room.

(b) Display of images in a multiplexed fashion.

(c) Recording of images in a time lapsed fashion and playback facility of images.

1.3.3

CCTV monitoring shall be provided for following plant equipment/areas:

S.No	Service	Qty for 1 Unit	Qty.for 2 Units	Remarks
(i)	ID Fans	2	4	
(ii)	FD Fans	2	4	
(iii)	PA Fans	2	4	
(iv)	Coal Mills	8	16	
(v)	BFP	2	4	
(vi)	CEP	2	4	
(vii)	CW Pumps	Plant Common	4	
(viii)	ACW Pumps	2	4	
(ix)	Boiler Operating Floor	2	4	
(x)	Turbine Hall	Plant Common	4	
(xi)	Bunker Floor	2	4	
(xii)	DM Plant Building	Plant Common	4	
(xiii)	Ash Plant Area	Plant Common	4	
(xiv)	Switchyard Control Building	Plant Common	2	
(xv)	Switchyard	Plant	2	

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<div>Common</div> <table><tr><td>(xvi)</td><td>Fuel Oil Tank Farm</td><td>Plant Common</td><td>2</td></tr><tr><td>(xvii)</td><td>Fuel Oil Pump House</td><td>Plant Common</td><td>2</td></tr><tr><td>(xviii)</td><td>Flue Stack</td><td>Plant Common</td><td>2</td></tr><tr><td>(xix)</td><td>Workshop</td><td>Plant Common</td><td>2</td></tr><tr><td>(xx)</td><td>Stores</td><td>Plant Common</td><td>2</td></tr><tr><td>(xxi)</td><td>Cooling Towers</td><td>Plant Common</td><td>4</td></tr><tr><td>(xxii)</td><td>HT Switchgears</td><td>Plant Common</td><td>4</td></tr><tr><td>(xxiii)</td><td>Generator Transformer</td><td>1</td><td>2</td></tr><tr><td>(xxiv)</td><td>Unit Transformer(s)</td><td>1</td><td>2</td></tr><tr><td>(xxv)</td><td>Unit Aux. Transformer(s)</td><td>1</td><td>2</td></tr><tr><td>(xxvi)</td><td>Cable Gallery</td><td>Plant Common</td><td>4</td></tr><tr><td>(xxvii)</td><td>Fire Water Pump House</td><td>Plant Common</td><td>2</td></tr><tr><td>(xxviii)</td><td>Water Intake Pump House</td><td>Plant Common</td><td>2</td></tr><tr><td>(xxix)</td><td>H2 Plant</td><td>Plant Common</td><td>2</td></tr><tr><td>(xxx)</td><td>Central Control Room</td><td>Plant Common</td><td>2</td></tr></table>				(xvi)	Fuel Oil Tank Farm	Plant Common	2	(xvii)	Fuel Oil Pump House	Plant Common	2	(xviii)	Flue Stack	Plant Common	2	(xix)	Workshop	Plant Common	2	(xx)	Stores	Plant Common	2	(xxi)	Cooling Towers	Plant Common	4	(xxii)	HT Switchgears	Plant Common	4	(xxiii)	Generator Transformer	1	2	(xxiv)	Unit Transformer(s)	1	2	(xxv)	Unit Aux. Transformer(s)	1	2	(xxvi)	Cable Gallery	Plant Common	4	(xxvii)	Fire Water Pump House	Plant Common	2	(xxviii)	Water Intake Pump House	Plant Common	2	(xxix)	H2 Plant	Plant Common	2	(xxx)	Central Control Room	Plant Common	2
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<table><tr><td>(xxxi)</td><td>Electronic Cubicle Room</td><td>4</td><td>8</td></tr><tr><td>(xxxii)</td><td>Coal Handling Area</td><td></td><td></td></tr><tr><td>(a)</td><td>Transfer points (Junction Towers)</td><td>Plant Common</td><td>20</td></tr><tr><td>(b)</td><td>Stacker Reclaimers</td><td>Plant Common</td><td>2</td></tr><tr><td>(c)</td><td>Reclaimers</td><td>Plant Common</td><td>2</td></tr><tr><td>(d)</td><td>Crusher Houses</td><td>Plant Common</td><td>4</td></tr><tr><td>(e)</td><td>Wagon Tippler</td><td>Plant Common</td><td>4</td></tr><tr><td>(f)</td><td>Bunkers</td><td>8</td><td>16</td></tr><tr><td>(xxxiii)</td><td>Spare</td><td>-</td><td>10</td></tr></table>				(xxxi)	Electronic Cubicle Room	4	8	(xxxii)	Coal Handling Area			(a)	Transfer points (Junction Towers)	Plant Common	20	(b)	Stacker Reclaimers	Plant Common	2	(c)	Reclaimers	Plant Common	2	(d)	Crusher Houses	Plant Common	4	(e)	Wagon Tippler	Plant Common	4	(f)	Bunkers	8	16	(xxxiii)	Spare	-	10
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(xxxiii)	Spare	-	10																																				
1.3.4	The CCTV system shall be complete in all respect and generally will comprise the following: (a) Colour Dome cameras with pre-configurable locations. (b) 2 nos Pan, tilt & zoom control units- 1 in CCR, 1 in Coal Handling Plant and 1 in service building security room. However, PTZ unit in security room shall be able to over ride the unit in CCR, multiplexers etc. (c) Necessary software for displaying camera images with multiplexing facility. (d) Necessary camera poles, camera housing and related accessories, necessary civil & masonry works.																																						
1.3.5	CCTV Camera																																						
1.3.5.1	Colour Dome cameras with auto IRIS motorised lenses. The camera shall be a high resolution, digital CCD camera comprising solid state circuitry housed in a rugged case. The camera shall incorporate digital signal processing, compatibility for DC or video type auto iris lens, back light compensation, internal or line-lock (with phase adjustment) synchronisation, automatic gain control, automatic electronic shutter and C / CS lens																																						
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<p>mount. The camera shall be UL / CE certified. The cameras shall have pan, tilt and zoom capabilities.</p> <p>1.3.5.2 As many cameras as required for proper surveillance of the selected areas shall be provided.</p> <p>1.3.5.3 Cameras shall be provided with UPS power supply.</p> <p>1.3.5.4 Cables both video and power to be routed in suitable conduits. Video cables to be put in separate conduit.</p> <p>1.3.6 Server/Client Workstation & Peripherals</p> <table><tr><th>Sl.No</th><th>Description</th><th>Unit</th><th>Qty</th></tr><tr><td>1</td><td>Redundant Server with 22" monitor, keyboard & mouse for the with necessary software licenses</td><td>No</td><td>1</td></tr><tr><td>2</td><td>Client Work Station with 22" monitor, keyboard & mouse with PTZ control units and necessary software licenses</td><td>No</td><td>3</td></tr><tr><td>3</td><td>Network Array Storage System for Perimeter CCTV</td><td>No</td><td>1</td></tr><tr><td>4</td><td>40" TFT LCD monitor for Large video display</td><td>No</td><td>6</td></tr><tr><td>5</td><td>A3 color laser printer</td><td>No</td><td>1</td></tr></table> <p>1.4 Security Card Access System</p> <p>1.4.1 Purpose of the facility is to control access to all vital areas within the important plant buildings by electronic card reader system.</p> <p>1.4..2 Access system cards shall be suitable for individual configuration of access privileges via access control software for controlling access to different locations. Biometric detection system is preferred. However, Bidder can offer other suitable systems also.</p> <p>1.4.3 Access controlled area entry/exit doors shall be fitted with Electro-magnetic locks. Access card reader shall be proximity card reader type.</p> <p>1.4.4 The card access system shall have a dedicated server to record all entries and exits through the card access locations.</p> <p>1.4.4.1 Short Range Proximity (HID) Card Readers</p>			Sl.No	Description	Unit	Qty	1	Redundant Server with 22" monitor, keyboard & mouse for the with necessary software licenses	No	1	2	Client Work Station with 22" monitor, keyboard & mouse with PTZ control units and necessary software licenses	No	3	3	Network Array Storage System for Perimeter CCTV	No	1	4	40" TFT LCD monitor for Large video display	No	6	5	A3 color laser printer	No	1
Sl.No	Description	Unit	Qty																							
1	Redundant Server with 22" monitor, keyboard & mouse for the with necessary software licenses	No	1																							
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<p>(a) Central Control Room – 10 card readers</p> <p>(b) Local Control Rooms – 20 card readers</p> <p>(c) Service Building – 10 card readers</p> <p>(d) Workshop – 2 card readers</p> <p>(e) Stores – 2 card readers</p> <p>(f) Switchgear Rooms – 10 card readers</p> <p>g) Main Entrance and Exit of Plant – 10 card readers</p> <p>(h) Adminstration building entrance and exits – 10 card readers</p> <p>(i) Other locations (to be identified during detailed engg. stage) – 10 card readers</p> <p>(j) Spare card readers – 10 card readers</p> <p>1.4.4.2 Long Range Smart Card Readers (for Vehicles)</p> <p>(a) Main Entrance and Exit of Plant – 10 card readers</p> <p>(b) Spare card readers – 2 card readers</p> <p>1.4.5 The card access system shall also comprise of the following:</p> <p>(a) Access card controllers to control the above card readers. Also to include 10% of the spare controllers or 2 controllers which ever is higher.</p> <p>(b) Smart Access cards for 500 plant personnel and 2000 cards for contract labours and visitors. And also spare cards of 500 nos.</p> <p>(c) Redundant Server with a Server work station and a Client work station.</p> <p>(d) Necessary software suitable for accommodating 3000 access cards.</p> <p>(e) 2 nos. of ID card Printers along with 2 nos. of web cameras to support the temporary ID card printing for visitors/contract employees.</p> <p>(f) 1 no. of A3 size color laser printer.</p>		
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1.4.6 Server/Client Workstation & Peripherals		
Sl.No	Description	Unit Qty
1	Redundant Server with 22" monitor, keyboard & mouse for the with necessary software licenses	No 1
2	Client Work Station with 22" monitor, keyboard & mouse with necessary software licenses	No 1
3	A3 color laser printer	No 1
4	I.D card printer	No 2
5	Webcam	No 2
1.5 Patrol Guard System		
1.5.1	Purpose of the system is to ensure that security guards on patrol duty are carrying out their duties diligently by recording the visiting time data for different locations.	
1.5.2	The system shall comprise of a selected number of proximity card readers located in various strategic locations of the power plant including the perimeter. The patrol guard recorder will record the date and time when the recorder is swiped on the magnetic strips.	
1.5.3	The recorder shall be suitable for downloading the data into a PC.	
1.5.4	The system shall be flexible to allow for addition / deletion or movement of monitoring locations.	
1.5.5	The patrol readers shall be suitable for operating with standard batteries.	
1.5.6	At least five (5) nos. of card readers shall be provided. Guard locations to be considered is 50.	
1.6 Local Area Network (LAN)		
1.6.1	Ethernet based Local Area Network (LAN) shall be provided for communication between the cameras and switches.	
1.6.2	The IP Network shall be of the gigabit type (1000Mbps) and shall utilize standard IEEE 802.3 protocols such as Ethernet. The bandwidth of LAN shall be decided by bidder and must be suitable for the total number of cameras / access system equipments. The bidder must furnish calculation of network capacity in their offer.	
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<p>1.6.3 Separate LAN shall be considered for the equipment monitoring CCTV system for 2 units and Perimeter surveillance system.</p> <p>1.6.4 Layer 3 capable Industrial network switch with firewall shall be used in the LAN.</p> <p>1.6.5 Each Switches provided shall be required no of minimum 4x fibre (1000Base-SX) 1Gbps uplink ports and 6. x STP (1000Base-T) 1Gbps uplink ports Ethernet switch, configurable via browser interface and have a 50% spare capacity for future addition of network points.</p> <p>1.6.6 The network shall be designed in a manner such that failure of an individual switch shall not hamper the failure of the entire system.</p> <p>1.7 Specific Requirements</p> <p>1.7.1 Server shall be as per the technical requirements specified later in this document :</p> <p>1.7.2 User/Client Work Station shall be as per the technical requirements specified later in this document</p> <p>1.7.3 The panels and JB shall be as per the technical requirements specified later in this document</p> <p>1.7.4 Camera: IP PTZ Speed Dome indoor Cameras-With all accessories</p> <table border="0"> <tr> <td>(i)</td><td>Sensor type</td><td>1/4" HAD CCD</td></tr> <tr> <td>(ii)</td><td>Zoom – optical + digital</td><td>36x optical zoom and 12x digital zoom up to 432x zoom</td></tr> <tr> <td>(iii)</td><td>Lens</td><td>f=3.4mm~122.4mm</td></tr> <tr> <td>(iv)</td><td>Light sensitivity – color</td><td>1.4 lux</td></tr> <tr> <td>(v)</td><td>Light sensitivity – monochrome</td><td>0.01 lux</td></tr> <tr> <td>(vi)</td><td>Night vision option</td><td>Required (IR based)</td></tr> <tr> <td>(vii)</td><td>Signal-to-noise ratio</td><td>> 50dB(AGC Close)</td></tr> </table>			(i)	Sensor type	1/4" HAD CCD	(ii)	Zoom – optical + digital	36x optical zoom and 12x digital zoom up to 432x zoom	(iii)	Lens	f=3.4mm~122.4mm	(iv)	Light sensitivity – color	1.4 lux	(v)	Light sensitivity – monochrome	0.01 lux	(vi)	Night vision option	Required (IR based)	(vii)	Signal-to-noise ratio	> 50dB(AGC Close)
(i)	Sensor type	1/4" HAD CCD																					
(ii)	Zoom – optical + digital	36x optical zoom and 12x digital zoom up to 432x zoom																					
(iii)	Lens	f=3.4mm~122.4mm																					
(iv)	Light sensitivity – color	1.4 lux																					
(v)	Light sensitivity – monochrome	0.01 lux																					
(vi)	Night vision option	Required (IR based)																					
(vii)	Signal-to-noise ratio	> 50dB(AGC Close)																					
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<table><tr><td>(viii)</td><td>White balance</td><td>Manual/Auto/Indoor/Outdoor/ATW</td></tr><tr><td>(ix)</td><td>Backlight compensation</td><td>Auto Manual.</td></tr><tr><td>(x)</td><td>AGC, Auto Iris</td><td>Auto Manual.</td></tr><tr><td>(xi)</td><td>Privacy masking</td><td>Required.</td></tr><tr><td>(xii)</td><td>Compression</td><td>MPEG-4 & H.264</td></tr><tr><td>(xiii)</td><td>Max. resolution PAL / NTSC</td><td>4CIF,704x576</td></tr><tr><td>(xiv)</td><td>Horizontal Resolution</td><td>>530TVL</td></tr><tr><td>(xv)</td><td>Max. frame rate</td><td>4CIF,25 fps supporting 8 users simultaneous access</td></tr><tr><td>(xvi)</td><td>Presets</td><td>32</td></tr><tr><td>(xvii)</td><td>Tours</td><td>16</td></tr><tr><td>(xviii)</td><td>Pan rotation speed</td><td>0. 1°~300°/Sec</td></tr><tr><td>(xix)</td><td>Tilt coverage</td><td>0-90 deg</td></tr><tr><td>(xx)</td><td>Network interface</td><td>Ethernet 1000 Mbps</td></tr><tr><td>(xxi)</td><td>Operating temperature</td><td>0—50deg</td></tr><tr><td>(xxii)</td><td>Operating Relative humidity</td><td>0 - 90% non-condensing</td></tr><tr><td>(xxiii)</td><td>Enclosure Protection</td><td>IP65</td></tr><tr><td>(xxiv)</td><td>Certification</td><td>FCC, CE</td></tr><tr><td>(xxv)</td><td>Range</td><td>150 metre with optical zoom</td></tr></table>				(viii)	White balance	Manual/Auto/Indoor/Outdoor/ATW	(ix)	Backlight compensation	Auto Manual.	(x)	AGC, Auto Iris	Auto Manual.	(xi)	Privacy masking	Required.	(xii)	Compression	MPEG-4 & H.264	(xiii)	Max. resolution PAL / NTSC	4CIF,704x576	(xiv)	Horizontal Resolution	>530TVL	(xv)	Max. frame rate	4CIF,25 fps supporting 8 users simultaneous access	(xvi)	Presets	32	(xvii)	Tours	16	(xviii)	Pan rotation speed	0. 1°~300°/Sec	(xix)	Tilt coverage	0-90 deg	(xx)	Network interface	Ethernet 1000 Mbps	(xxi)	Operating temperature	0—50deg	(xxii)	Operating Relative humidity	0 - 90% non-condensing	(xxiii)	Enclosure Protection	IP65	(xxiv)	Certification	FCC, CE	(xxv)	Range	150 metre with optical zoom
(viii)	White balance	Manual/Auto/Indoor/Outdoor/ATW																																																							
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1.7.5 Fixed Integrated IP Box type with motorised Zoom (36X) lens Camera with heater and blower			
(i)	Sensor type	Wide Dynamic Range - Progressive Scan CCD ie ¼ CCD	
(ii)	Zoom – optical + digital	36x optical zoom and 12x digital zoom up to 432x zoom	
(iii)	No. of pixels (effective)	752 (H) x 582 (V)	
(iv)	Horizontal Resolution	>530TVL	
(v)	Light sensitivity	1.4lux (color) and 0.01 lux (mono)	
(vi)	Night vision option	Required (IR based)	
(vii)	White balance	Auto (ATW/AWB)	
(viii)	Backlighting compensation	Yes	
(ix)	AGC, Auto Iris	Yes	
(x)	Privacy masking	Required.	
(xi)	Compression algorithm	MPEG4, H.264, M-JPEG	
(xii)	Network Interface	Ethernet 1000 Mbps	
(xiii)	Max resolutions	4CIF,704x576	
(xiv)	Max. frame rate	4CIF, 25 fps supporting 8 users simultaneous access	
(xv)	Enclosure	Aluminium with powder painting – (IP65 weather proof)	
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<div><div>(xvi)</div><div>Environment</div><div>Outdoor, Operating temperature with heater. - 20 °C / +60 °C.</div></div> <div><div>(xvii)</div><div>Operating Relative humidity</div><div>0 - 90% non-condensing</div></div> <div><div>(xviii)</div><div>Wide dynamic Range</div><div>150 meter with optical zoom</div></div> <div><div>(xix)</div><div>Certifications</div><div>CE,FCC</div></div> <div><div>(xx)</div><div>Range of coverage</div><div>150 meter with optical zoom</div></div> <div><div>1.7.6</div><div>Network Array Storage (NAS):</div><div><div><div>(i)</div><div>Capacity:</div><div>24TB or as required for storing video of all cameras for 90days</div></div><div><div>(ii)</div><div>Configuration</div><div>Intel Core2 Duo E8400 @ 3GHz CPU, 2GB DDR2 Memory with hot-swap drives and automatic rebuild; dual hot-swap power supplies; redundant variable-speed hot-swap chassis cooling fans.</div></div><div><div>(iii)</div><div>RAID Support</div><div>RAID 0, 1, 10, 5, and ,10,30,60 protection on a per-Storage Pool basis</div></div><div><div>(iv)</div><div>Expandability:</div><div>Should be expandable up to 96TB</div></div><div><div>(v)</div><div>High Performance</div><div>Quad-Gigabit Ethernet connectivity and high-performance embedded architecture, plus link aggregation (port bonding) provide extremely high throughput.</div></div><div><div>(vi)</div><div>Sophisticated networking</div><div>Ethernet port bonding for load balancing, high performance bandwidth aggregation or failover; Virtual LAN (VLAN) capability simplifies management and operation by enabling devices to be logically, but not physically in the same</div></div></div></div>			
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<div> <div>(vii)</div> <div>Mounting</div> <div>subnet. Desktop</div> </div> <div> <div>(viii)</div> <div>Redundancy</div> <div>Required</div> </div> <p>1.7.7 Video Management Software (VMS)</p> <p>As a core of the IP video solution, VMS server software shall be provided for both equipment monitoring CCTV system as well as Perimeter surveillance system. The VMS server software shall have the following characteristics:</p> <div> <div>(a)</div> <div>The host server(s) shall be stand-alone or integrated products from a recognized IT industry leader with internal or external storage arrays.</div> </div> <div> <div>(b)</div> <div>Recorded video shall be stored on to the network storage devices</div> </div> <div> <div>(c)</div> <div>The VMS Software shall be compatible with a latest proven Windows server operating system</div> </div> <div> <div>(d)</div> <div>The server software shall support PTZ control for all cameras & record video stream from all Cameras (IP).</div> </div> <div> <div>(e)</div> <div>Multiple VMS host servers shall be deployed concurrently and seamlessly networked together to support an unlimited number of total cameras.</div> </div> <div> <div>(f)</div> <div>The VMS shall offer integration with leading facility access control system and security automation systems.</div> </div> <div> <div>(g)</div> <div>The VMS server(s) shall connect to an enterprise LAN or WAN network via a Gigabit Ethernet connection.</div> </div> <div> <div>(h)</div> <div>The client viewing and configuration applications shall operate on workstations connected (locally or remotely) to the LAN/WAN, and shall communicate with the VMS across this network. The VMS host server(s) and client applications shall communicate using the TCP/IP protocol.</div> </div> <div> <div>(i)</div> <div>Communication with the VMS shall be tightly restricted. Each VMS host server shall be deployed 'behind' a standard and LAN/WAN security firewall,</div> </div> <div>ISSUE R1</div>		

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<p>benefiting from the virus and malware protection software and other encryption and intrusion defenses in place on that network.</p> <p>(j) The VMS shall support multiple levels of user and administrator password authentication and privileges management to control access to the system. Each VMS shall keep a running log of all user access. These logs shall be retrievable by authorized administrators, but no user shall be able to remove entries from a log.</p> <p>(k) Alarm Notification: The VMS shall distribute notification of alarms to clients who have requested notification. All video associated with the alarm shall be displayed automatically on receipt of an alarm.</p> <p>(l) Video Playback: VMS shall support video playback by retrieving from the storage. It shall be possible to display the playback window beside the live video window. Also should support instant playback historic video record for the past 30 Seconds from live view window directly. Video Playback feature shall support the controls like Forward, Reverse, Pause, Move to the beginning/end. The speed of playback shall be variable, including or 8/16/32/64X, Frame by frame, forward and backward play back .</p> <p>(m) PTZ Control: The VMS shall allow for connection to IP PTZ cameras. Multiple PTZ cameras may be 'daisy-chained' on a single port as defined by the PTZ protocol being deployed. Control of these cameras shall be through a physical desktop PC connection to a PTZ controller (keypad/joystick) or through on-screen software controls. On-screen software controls shall include direction of camera movement, zoom, focus and configuration of camera preset locations.</p> <p>(n) VMS server shall support Compressed video & audio and Time stamping consisting of date and time with resolution in seconds,</p> <p>(o) Recording: VMS server shall support the following method of recording live video</p> <ul style="list-style-type: none"> - User activated - Event activated - Scheduled - Continuous background recording - Video motion detection 		
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<p>- Snapshot</p> <p>(p) Time Synchronisation: The VMS shall allow for clock synchronization to occur manually or from a central location through a network time protocol server or enterprise management server. The VMS shall allow the cameras to time sync with its clock.</p> <p>(q) Video Loss Detection: The VMS shall constantly monitor all video inputs for a synchronization signal and, if enabled, notify the administrator if a signal loss is detected.</p> <p>1.7.8 Client (User) Software</p> <p>1.7.8.1 General</p> <p>(a) Cameras, VMS, VMS client in this solution should be developed and maintained by a single manufacturer.</p> <p>(b) The primary client software shall be Windows® XP/Windows® latest PC compatible</p> <p>(c) The client application shall be a graphical, full-featured software interface with customizable user privileges to various section/tasks of the system.</p> <p>(d) All administration tasks like VMS configuration, system health monitoring, live video monitoring, archived video retrieval and packaging into secure case evidence, and third-party review of exported evidence.</p> <p>(e) A common software interface or client application can configure and manage all cameras, servers, decode stations.</p> <p>(f) The software shall support up to 4 or more monitors per VMS host server and up to 16 camera views or windows per monitor, in flexible grid arrangements.</p> <p>(g) The VMS client application shall provide a comprehensive set of features for searching, retrieving and reviewing stored video, regardless of where on the network the video is stored.</p> <p>(h) Digital Zoom in/Out support with both live view and historical video record view</p>		
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<p>1.7.8.2 Alarm Handling</p> <ul style="list-style-type: none"> (a) The VMS client application shall provide a comprehensive set of features for handling security alarms generated during the surveillance process. (b) Multiple simultaneous alarms shall be supported in real time by the VMS and the client software. (c) Pop-up of live incident video on defined workstations or video wall monitors. (d) Alarm triggered video on E-Map. Initiation of preset camera and map viewing sequences. (e) A single mouse click shall allow monitoring personnel to immediately view live video associated with an alarm incident. The option to display emergency response procedures, security or other contact information, and this information shall be modifiable as necessary for multi-site installations. (f) Each alarm shall also cause an automatic record of all operator response actions to be logged in an interactive folder system that contains links to the specific audio (if applicable) and video record of the incident. Clicking on an alarm shall cause that data to be rendered on screen automatically. The log shall also include a record of all operator screen activity for post-alarm analysis, personnel reviews or training. <p>1.7.8.3 Integration of Site Maps</p> <ul style="list-style-type: none"> (a) The software shall be capable of importing two dimensional (2D) images of floor plans, building or campus layouts or other facility or site geometries. 2D images shall be supported in .bmp or .wmf formats. Also should support Auto CAD, SHP, JPG. (b) A series of interactive icons shall be provided to deploy on top of these imported map images to indicate the location of each physical camera and enable the point-and-click interface to launch on demand a live video window from the selected fixed or PTZ camera. (c) It shall be possible to layer or nest multiple maps within the primary client screen to leverage these virtual representations across even very large or complex facilities and surveillance deployments. Simple zoom and navigation features shall provide granularity and efficiency when larger facility maps are used. <p>1.7.9 Application Software functions (Applicable for both Perimeter surveillance as well as</p>		
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<p>CCTV Monitoring)</p> <p>1.7.9.1 Live Video: The live output from cameras shall be viewed through a series of displays at a 40 deg C LED monitor provided in the security room. The software shall support</p> <ul style="list-style-type: none"> (i) Single camera view (ii) Quad view of up to four cameras (iii) Sequence view of camera preset positions (iv) Modifying settings for a camera (v) Modify recording setting for a camera (vi) Adding and deleting cameras (vii) Creating schedules for recordings and view motion detection (viii) Modifying analytics settings and tuning for video motion detection. <p>1.7.9.2 The system shall also support multiple monitors in the following way:</p> <ul style="list-style-type: none"> (a) Alarm Monitor: <p>When an alarm occurs in the security or control system server, the live video output of the camera associated with that alarm shall be switch directly to an alarm monitor. The user shall be able to acknowledge the alarm to clear the monitor using the numeric keypad. Cameras that are directed to alarm monitors will not be removed from the queue unless explicitly cleared by the operator. It shall be possible to create a queue of alarm monitors to manage multiple alarm view simultaneously.</p> (b) Cyclic Alarm Monitor: <p>An alarm monitor shall be available at the end of alarm monitor queue to cycle the camera views from acknowledged alarms if the number of cameras to view exceeds the number of alarm monitors. Once the alarm monitor queue is filled any new alarm will be placed in the queue relative to its priority and time of occurrence. Existing activated alarm camera views shall reshuffle to accommodate the new alarm in the event that all the available alarm monitors</p> 		
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<p>are used the oldest active alarm cameras shall be added to the cycling alarm monitor. The alarm views shall cycle on this final alarm monitor until acknowledged and cleared by an operator in the event of multiple alarms added to this monitor,</p> <p>(c) Surveillance Monitor:.</p> <p>Operator shall be able to send any quad view, sequence view or single camera view to a surveillance monitor. User shall be able to clear the monitor using the numeric keypad. Monitors shall be able to be configured to act as both alarm and surveillance monitors. In this case, the monitor behaves as a surveillance monitor until an alarm occurs, in which case it shall show the alarm video. Once the alarm is acknowledged the video previously shown is displayed again In each these cases, these additional monitors shall be either connected to an operator station using a multi monitor PC card or to other PCs. The surveillance monitor shall support the below features</p> <p>(d) Single Camera Mode:</p> <p>(i) View the live output from the selected camera.</p> <p>(ii) Manually recording of live video that will continue for the configured period of time.</p> <p>(iii) Enabling video motion detection for the selected camera.</p> <p>(iv) Support for Pan, tilt, zoom and focus the camera using a joy stick attached to the OS.</p> <p>(v) PTZ Control through standard devices like mouse or touch screen shall also be supported.</p> <p>(vi) The following PTZ characteristics shall be tuneable on a camera by camera basis from the camera definition page</p> <ul style="list-style-type: none"> • Pan speed • Tilt speed • Zoom speed • Focus speed • Iris speed • Increment step size <p>(vii) Operator shall be to set the Camera number, Description and Location</p>		
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<p>details for each of the camera.</p> <p>(viii) For each camera, the operator shall be able to configure the parameters such as camera streamer type, resolution, video frame rate, choice of live levels of video compression, equally distributed from minimum to maximum compression, streamer IP address, streamer camera number, choice of frame rate or bandwidth limited streaming, unicast or multicast transmission of video, PAL or NTSC camera format.</p> <p>(e) Quad view</p> <p>The system shall support quad views. A quad view consists of up to four related cameras viewed simultaneously on a single display. The quad view shall be divided into four quadrants. Within each quadrant the quad view shall be configured to cycle between any of the cameras accessible to the user on a configurable time basis. There shall be no limit to the number of cameras that can be assigned to a single quad view. There shall also be no limit to the number of available quad views.</p> <p>(f) Sequence view</p> <p>The system shall support sequence views. A sequence view consists of a single camera view, which can be cycled on a time basis, pan-tilt-zoom cameras, which support preset positions can have these presets cycled on a time basis. In this way an operator can view a variety of presets on a series of PTZ cameras. Fixed cameras can also be included in the sequence and cycled accordingly. There shall be no limit to the number of cameras that can be assigned to a single sequence view. There shall also be no limit to the number of available sequence views.</p> <p>1.7.10 Industrial Grade Network Enclosure: Quantity shall be as as required at site</p> <p>Industrial Grade Network Enclosure of reputed make, with 2 numbers of cooling fans for mounting Video Encoder(s), Industrial grade Fiber media converter module(s) / Ethernet Switch, Receiver Driver Units, LIU and other accessories as required. Mounting shall be in the scope of supplier, Should have a Lead plated copper earth bus bar 100mmX18mmX5mm, holes (M4) & MS bolts for Cubicle Earth Internal power distribution and complete wiring is in the scope of the supplier. Supplier shall also consider, cable glands for termination of all cables. Supplier shall submit mounting arrangement drawing and wiring scheme for approval. Indoor / outdoor type of enclosures may be considered and supplied as per site requirements</p>		
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<p>1.7.11 Erection Hardware and accessories: Quantity shall be as as required at site</p> <p>Complete cabling should be laid through Solid GI Cable Trays / GI Pipes (Solid & Flexible). All cables (Signal/Video/Network) from Network enclosures to Cameras should be through GI Pipes. Where existing Cable trays are available they can be used to lay the fibre cables but where not available Solid GI trays to be laid.</p> <p>1.7.12 Cables</p> <p>1.7.12.1 The instrumentation and control cables and Fibre optic cables shall be as per the technical requirements specified later in this specification.</p> <p>1.7.12.2 Power cables shall be as per the technical requirements specified as specified later in this specification.</p> <p>1.7.12.3 All Cables should be suitable for the following installation</p> <ul style="list-style-type: none"> (i) All the cables shall be armoured. (ii) Direct buried in underground trenches conduits with uncontrolled back up and possibility of flooding by water and chemicals. (iii) Laid underground in RCC lined cable trenches with possibility of flooding by water (iv) Colour coding for cables shall be approved by Owner. (v) Ferruling indicating terminal numbers on termination side shall be followed. Only sleeve type ferruling with printed terminal numbers, cable number and core number shall be used. Cross ferruling shall be adopted. (vi) All the outdoor and buried applications, etc. shall be routed through GI conduits. Exposed indoor cabling shall be minimal and when used, the cables shall be laid in FRLS PVC conduits. Where wall chasing is adopted, PVC conduits are to be used. (vii) All cables, conduits and associated accessories are included in the scope of supply. <p>2.0 NOTES</p> <p>1 Plant Security and Surveillance system is illustrated in Annexure</p>		
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<p>2 The BOM indicated here under this section is not complete and are only tentative. The actual items and quantities shall be as per the system requirements to make it functional to meet the intent of this specification.</p>		
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Applicable for servers used in CCTV

2.0 HARDWARE REQUIREMENTS

2.1 SERVER HARDWARE SPECIFICATION

Server shall be of latest configuration available in market but with following requirements in minimum:

(a)	Make/Model	HP, DELL, IBM / Tower/6U Rack Mounted
(b)	Processors	4 Dual Core 64bit Intel Xeon Processor, 3.0 GHz or better with min of 16 MB Cache
(c)	System Bus	Dual independent 800 MHz or better
(d)	RAM	24 GB, DDR-3 ECC RAM expandable to 192 GB
(e)	Hard Drives	Min. of 3.6 TB expandable to 14.4 TB
(f)	Raid Controller	SAS RAID Level 5
(g)	DVD R/W	1 no. 52X CD RW & 16X DVD RW IDE Combo
(h)	Power Supply	Dual redundant / Hot swappable
(i)	Fans	Dual redundant / Hot swappable
(i)	Ethernet Card	4 nos. x 10/10/1000MB/1GB (2 onboard & 2 add-on)
(k)	Network Controller	1 GbE NIC upgradable to 10 GbE
(l)	Graphics Card	SVGA integrated with min. 64MB DDR RAM
(m)	PCI Slots	2 PCI-E Slots (1 x 4 lanes & 1 x 8 lanes) 2 PCI-X Slots (64bit/100MHz) 2 PCI Slots (1 x 32bit/33MHz & 1 x 64bit/66MHz)
(n)	Serial Port (RS232)	1 no
(o)	Parallel Port	1 no

- | | | |
|-----|------------------|---|
| (p) | USB Port | 4 nos |
| (q) | Peripherals | 1 no. USB/ PS2 Optical Mouse
1 no. USB/PS2 Multimedia Keyboard
1 no. 21"/22" Colour TFT/LCD Monitor |
| (r) | Operating System | Latest Proven Windows Server |

Applicable for PC used in CCTV, access control and Patrol Guard system

2.2 USER/WORK/OPERATOR/ENGG STATION HARDWARE SPECIFICATION

- | | | |
|-----|---------------------|---|
| (a) | Processor | Core i7 Processor, 3.2 GHz or better |
| (b) | RAM | 4 GB DDR2 RAM |
| (c) | Mother board | Intel Express chipset |
| (d) | Graphics | Onboard with min 512 MB Video Memory |
| (e) | Hard Drives | 1 no. x 500 GB SATA HDD @ 7200 RPM or Higher |
| (f) | DVD R/W | 1 no. 52X CD RW & 16X DVD RW IDE Combo |
| (g) | Ethernet Card | 2 nos. x 10/10/1000MB |
| (h) | Network Controller | 1 GbE NIC upgradable to 10 GbE |
| (i) | Serial Port (RS232) | 2 nos. |
| (j) | Parallel Port | 1 no. |
| (k) | USB Port | 4 nos. |
| (l) | Peripherals | 1 no. USB Optical Mouse
1 no. USB Multimedia QWERTY Keyboard
1 no. 21" Colour TFT/LCD Monitor |
| (m) | Operating System | Windows XP Professional or Latest Proven Windows OS. |

2.3 Keyboard

Applicable for CCTV, access control and Patrol Guard system

2.3.1 Keyboard for OS

Qwerty type Keyboard shall be provided for operator interface with process for plant control and display functions to access plant data in conjunction with Operator station

System Cabinets

Applicable for Panel/cabinets used in CCTV, access control and Patrol Guard system

These cabinets shall house signal-conditioning cards, input/output cards, processor cards & associated power supply units. Indoor located, free standing vertical type system cabinets with IP-32 enclosure and with 2 mm thick sheet metal of cold rolled steel; double doors with neoprene gaskets; ant vibration pads of 15 mm thick; blower & louvers in each cabinet with brass mesh; fire proof compound (50 mm thickness) for sealing cable entry (bottom); fire detector for each cabinet. The racks in system cabinets shall have provision along with plug in sockets/back plane to house accommodate the spare slots/modules as specified elsewhere. The colour of the cabinets shall be indicated at detailed engineering stage. Doors shall have concealed type of hinges and swing of 100o. to, on the side to help the operator. Power supply distribution shall be provided on per cabinet basis with all associated MCBs, protections, etc. The system cabinets, racks in system cabinets, slots in the racks & the terminals shall have identification numbers. A stainless steel metal tag (plate) shall be fixed to the inside of the door & the layout of the racks, slots & details of the card type/service shall be inscribed on this metal tag. Each cabinet shall be provided with one each 3 pin receptacles for 240 V, 1P, 50 C/S and receptacles for +24V DC. Cabinet shall be delivered totally wired. All electronics shall be mounted & wiring connections at these hardware shall be terminated by Bidder. Quantity shall be as required. One of the doors shall be provided with folder to keep the relevant engineering document of the cabinet.

All cabinets shall have common key for the locks.

In each cabinet, a 24 VDC Voltmeter shall be provided to check the Field Interrogation voltage.

Junction Boxes (JB)

Applicable for JB used in CCTV, access control and Patrol Guard system

All JBs shall be Galvanised. Wall/column mounted junction boxes having suitable number of terminals and cable entry only at the bottom and sealed with fireproof compound; Screwed terminal type; IP 65 or equivalent degree of protection for enclosure.

Removable gland plate shall be supplied. JB shall have single lockable door with gasket, able to open side ways, with common keys. Painting inside shall be glossy white & outside - IS-5 shade 631. Shield bus for screw connection shall be provided. Terminal size shall be suitable for Cables used in the system. Terminal blocks shall be vertical. JB shall have provision to add 10% additional terminals. Accessories like metal tag (SS), clamps, fixtures, bolts (SS), nuts (SS), gaskets (neoprene), lock & key, fireproof compound for sealing, etc. shall be supplied. The grouping of instruments in JBs is subject to Owner / Project Manager's approval. All the field Junction boxes shall have single doors and provision for locking. The doors shall not have screwed type of locking, but turnable hinge based. The JBs are subject to approval prior to manufacturing All JBs shall be provided with individual canopies to avoid ingress of water.

All the TBs used shall be 6.6polymide to withstand corrosion and the metallic portion shall be coated against rust / corrosion.

ANNEXURE –2
LIST OF MANDATORY SPARES

SL.	ITEM/DESCRIPTION	QUANTITY / UNIT
17.0	Servers	
17.1	RAM	1 no
17.2	Hard Disc Drive	2 nos
17.3	Raid Controller	1 no
17.4	DVD RW Drive	1 no
17.5	Power Supply Module	2 nos
17.6	Graphics Accelerator Card	1 no
17.7	SVGA Adaptor	1 no
17.8	External Network Interface card	2 nos
17.9	Ethernet LAN Card	2 nos
17.10	Serial Port Card	1 no
17.11	Parallel Port Card	1 no
17.12	Power Supply Cord/ Cable	2 nos.
17.13	Any Other Special Cord/ Cable	2 nos.

ANNEXURE –3
QUALITY ASSURANCE PLAN

(For reference only and is subject to approval by end customer / consultant)

S. No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS OF CHECK	TYPE OF CHECK	QUANTITY	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
								DOCUMENT	DR #	S	M	C	
1	Camera	1.Electrical Functional Test Zoom Function Day & Night Mode Pan movement, Tilt Movement (Applicable for PTZ Camera) Back light compensation White balance AUTO/Indoor/outdoor/Manual Alarm inputs	Major	Electrical	Sample	Approved drawings/datasheet	Approved drawings/datasheet	IR		P	W	W	

2	Keyboard	3. Electrical Functional Test Input voltage Control and selection of camera including pan/tilt (if applicable) & zoom using keyboard & mouse	Major	Electrical	Sample	Approved drawings/datasheet	Approved drawings/datasheet	IR		P	W	W	
---	----------	--	-------	------------	--------	-----------------------------	-----------------------------	----	--	---	---	---	--

3	Control Video Monitor	1.Electrical Functional Test Input Voltage Control OSD menu, cursor down, Cursor UP, decrease adjustment, Switch Video Input	major	Electrical	Sample	Approved drawings/datasheet	Approved drawings/datasheet	IR		P	W	W	
---	-----------------------	---	-------	------------	--------	--------------------------------	--------------------------------	----	--	---	---	---	--

4	Server & Video Recorder	1.Electrical Functional Test Input Voltage Search Date & time ,camera Recording speed N frames per seconds programmable	Major	Electrical	Sample	Approved drawings/datasheet	Approved drawings/datasheet	IR		P	W	W	
5	Rack/Panel/JB/Pole	Dimension	Major	Dimensional	Sample	Approved drawings/datasheet	Approved drawings/datasheet	IR		P	W	W	
6	Ingress Protection	Type Test	Major	Type Test	Prototype	Approved drawings/datasheet	Approved drawings/datasheet	Valid Type test certificate	*	P	R	R	

7	BOM	BOM Verification	Major	Visual	100%	Approved BOM	Approved BOM	IR		P	W	R			
SKS	SA	SD	<p>S: Manufacturer/ Sub Vendor M: EPC Contractor L&T / Third Party Inspection Agency (TPIA) C: End user/ Customer</p>												
Prepared by	Reviewed by	Approved By	<p>P: Perform, W: Witness, RW: Random Witness 10%, R: Review of certificate/record, H: Hold, ITR: Internal test report, MTC: Material Test Certificate, IR: Inspection report. CHP: Customer hold point</p>												
			<p>NDE : Non Destructive Examination VT: Visual Testing WPS: Welding Procedure Specification</p>			<p>MT; Magnetic Particle Testing PT: Dye Penetration Testing RT: Radiographic Testing UT: Ultrasonic Testing</p>			<p>WPQ: Welder Performance Qualification T: Thickness L&T - Larsen & Toubro Ltd. D* : For Items Marked (*) In Column "D" Test Certificates shall be Submitted</p>			<p>L&T Representative</p>		<p>Customer/ customer representative</p>	

ANNEXURE – 4
DELIVERY SCHEDULE

Delivery Schedule

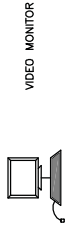
Sl.No.	Description of Activity	Target	Common Target
	Submission of Documents by Vendor	Within 3 weeks from PO	
	Document approval by customer	3 weeks from submission.	
	Re-submission implementing RRVUNL/TCE's comment till approval.	Additional 2 week (each re-submission)	
	Approval of Document by RRVUNL/TCE	Expected 7 to 11 weeks after PO	
1.	Manufacturing Clearance	After Document Approval	
2.	Material readiness with internal quality check report		Sep-2016
3.	Inspection Call by Vendor		Sep-2016
4.	Inspection by L&T/TCE/RRVUNL		Sep-2016
5.	Dispatch Clearance		Sep-2016
6.	Dispatch of Material		Sep-2016

ANNEXURE – 5
SPECIFICATION COMPLIANCE TABLE

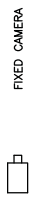
Form for Submission of Vendor's Compliance to Specification			
Clause no.	Description	Vendor's compliance/acceptance	Remarks/Deviation, if any
2	Definition of different types of spares		
3	Codes & Standards		
4	General Requirements		
4.1	System Proveness Criteria		
4.2	General Design requirements		
4.3	Panel specifications (if applicable)		
4.4	Wiring and Terminal Block specifications		
4.5	Grounding guidelines		
4.6	Document Requirement		
4.7	Approved vendor list for bought out items		
5	Drawings and documents to be submitted		
6	Technical Requirements covering the following		
6.1	Scope of Work		
6.1.1	Scope of Supply		
6.2	Scope of Services		
6.3	Terminal Points		
6.4	Exclusions		
Annexure-1	RRVUNL technical specifications requirements		
Annexure-2	Painting Requirement		
Annexure-3	List of Essential spares		
Annexure-4	Quality assurance plan		
Annexure-5	Delivery Schedule		
Annexure-6	Specifications Compliance table		
Annexure-7	Typical Schematic		
Annexure-8	Plot Plan		
Annexure-9	Training		

ANNEXURE – 6
TYPICAL SCHEMATIC

LEGEND



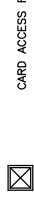
VIDEO MONITOR



FIXED CAMERA



DOME CAMERA



CARD ACCESS READER



PAN TILT & ZOOM CONTROL UNIT



REMOTE TERMINAL UNIT



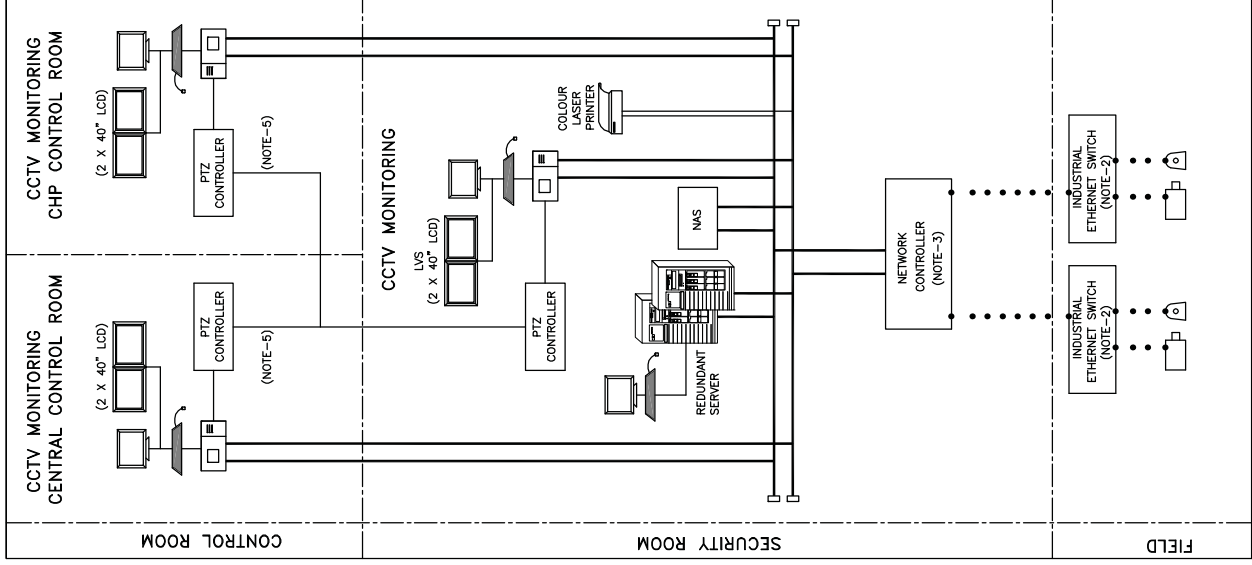
FIBRE OPTIC CABLE



STATION LAN CABLE

NOTES

1. SCHEME INDICATES CONCEPTUAL REQUIREMENT OF DIFFERENT ELEMENTS OF PLANT SECURITY & SURVEILLANCE SYSTEM, SUCH AS PLANT PERIMETER INTRUDER DETECTION, CCTV, ACCESS CONTROL & PATROL GUARD ETC. BIDDER TO DEVELOP DETAILED SCHEME BASED ON SPECIFIED REQUIREMENT.
2. INDUSTRIAL ETHERNET SWITCHES WILL BE LOCATED GEOGRAPHICALLY AT DIFFERENT LOCATIONS IN THE PLANT.
3. NETWORK CONTROLLERS WILL BE LOCATED IN SECURITY ROOM. AS MANY NETWORK CONTROLLERS AS REQUIRED TO BE PROVIDED.
4. PERIMETER INTRUDER DETECTION IS BASED ON VIDEO MOTION DETECTION TECHNOLOGY.
5. PTZ CONTROLLER UNIT AT SECURITY ROOM CAN OVERIDE PTZ CONTROL UNIT AT CC/C/CHP CONTROL ROOM.
6. GUARD PATROL SYSTEM IS A STAND ALONE SYSTEM.



FOR RO ISSUE ONLY		ISSUE		REVISIONS		CLEARED		APPD DATE		FILE NAME: 103000-000000		TATA CONSULTING ENGINEERS LIMITED		MUMBAI		DO NOT SCALE		FOR BID PURPOSE ONLY	
DEPT	SIGNATURE	CLEAR	DATE	NO	DATE	CHEM	CHL	ELEC	MECH	DATE	NAME	NO	DATE	ISSUE	DATE	NO	DATE	NO	DATE
CHEM																			
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ELEC																			
MECH																			

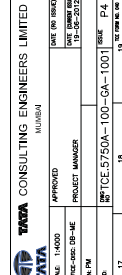
CLIENT : 2x660 MW, SUPER-CRITICAL TPS, STAGE-V, UNIT # 7 & 8 AT SURATGARH, RAJASTHAN

FILE NAME: F04384.DWG

TCE FORM NO. 043 R4

ANNEXURE – 7

Plot Plan



ANNEXURE – 8

TRAINING REQUIREMENT

ANNEXURE-8

Project: 2 X 660 MW Suratgarh SUPERCRITICAL TPS
Document: Training Plan for CCTV, Access control system, Patrol Guard system and Perimeter Intrusion Detection System

Sr. No.	Name of System / Package / Equipment	Operation			Maintenance			Commissioning		
		Manufacturer's Works	Hrs.	Location	Manufacturer's Works	Hrs.	Location	Manufacturer's Works	Hrs.	Location
1	CCTV and Perimeter Intrusion Detection System	96	Later	NA	NA	NA	160	NA	NA	Later

Notes : 1) Please mention as NA, whichever is not applicable.
2) Please include all equipment under main package / system for which training is to be provided.

ANNEXURE – 9

**TECHNICAL SPECIFICATION OF
CABLES**

Applicable for FO cable for CCTV

1.47.6 Fibre Optic cables

1.47.6.1 Mono mode type fibre optic cable shall have following parameters:

- (a) Wavelength band optimized : 850nm / 1300nm / 1550nm
Mode field diameter : 9-10m + 10% of nominal value
Cladding diameter : 125m + 3
Non-concentricity core/cladding : not more than 2m
Non-circularity of cladding : not more than 3m
Cut-off wavelength : 1200mm
- (b) Mode field diameter : 9-10m + 10% of nominal value
- (c) Cladding diameter : 125m + 3
- (d) Non-concentricity core/cladding : not more than 2m
- (e) Non-circularity of cladding : not more than 3m
- (f) Cut off wavelength: 1200mm
- (g) Attenuation : Less than 0.3-0.4 dB/Km at 1300nm, less than 0.15 - 0.25 dB/km at 1550nm

TECHNICAL SPECIFICATION OF POWER CABLE

		<div><div><div>ભારતીય વીજળી</div><div><div>BHEL</div></div></div><div>A4-11</div></div>		CE/416/SURAT/CBL/CC/TR	
				REV	00
				PAGE	02 OF 08

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1.00.0

CODES & STANDARDS

1.01.0

All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions as on date of opening of bid. In case of conflict between this specification and those (IS: codes, standards, etc.) referred to herein the former shall prevail. All the cables shall conform to the requirements of the following standards and codes :

IS : 1554 – I

PVC insulated (heavy duty) electric cables for working voltages up to and including 1100 V.

IS: 3961

Recommended current ratings for cables.

IS : 3975

Low carbon galvanized steel wires, formed wires and tapes for armouring of cables.

IS: 5831

PVC insulation and sheath of electrical cables.

IS: 8130

Conductors for insulated electrical cables and flexible cords.

IS: 10418

Specification for drums for electric cables.

IS: 10810

Methods of test for cables.

ASTM-D-2843

Standard test method for density of smoke from the burning or decomposition of plastics.

ASTM-D-2863

Standard method for measuring the minimum oxygen concentration to support candle like combustion of plastics.

IEC - 754 (Part - I)

Test on gases evolved during combustion of electric cables.


IEC - 332


Tests on Electric cables under fire conditions. Part - 3 : Tests on bunched wires or cables (Category - C).

IEE - 383


Flammability test.

TECHNICAL SPECIFICATION OF POWER CABLE

		<div><div><div>बि एच ई एल</div><div></div><div>A4-10</div></div></div>		<div>CE/416/SURAT/CBL/CC/TR</div> <div>REV 00</div> <div>PAGE 03 OF 08</div>															
		<div>2.00.00 TECHNICAL REQUIREMENTS</div> <div>2.01.00 The cables shall be suitable for laying on racks, in ducts, trenches, conduits and under ground buried installation with chances of flooding by water.</div> <div>2.02.00 Cables shall be flame retardant low smoke (FRLS) type designed to withstand all mechanical, electrical and thermal stresses develop under steady state and transient operating conditions as specified elsewhere in this specification.</div> <div>2.03.00 Conductor of control cables shall be made of stranded, annealed tinned copper.</div> <div>2.04.00 Extruded PVC -A insulation shall be suitable for continuous conductor temperature of 70 deg. C and short circuit conductor temperature of 160 deg. C.</div> <div>2.05.00 The cable cores shall be laid up with fillers between the cores wherever necessary. It shall not stick to insulation and inner sheath. If fillers are used to make the cable round same shall also be with FR properties All the cables, other than single core unarmoured cables, shall have distinct extruded PVC – FRLS ST1 inner sheath of black colour as per IS : 5831.</div> <div>2.06.00 For single core armoured cables, armouring shall be of aluminium wires. For multicore armoured cables armouring shall be of galvanized steel as follows :<table><thead><tr><th>Calculated nominal dia Of cable under armour</th><th>Size and Type of armour</th></tr></thead><tbody><tr><td>i) Upto 13 mm</td><td>1.4 mm dia GS wire.</td></tr><tr><td>ii) Above 13 & upto 25 mm</td><td>0.8 mm thick GS formed wire / 1.6 mm dia GS wire.</td></tr><tr><td>iii) Above 25 & upto 40 mm</td><td>0.8 mm thick GS formed wire / 2.0 mm dia GS wire</td></tr><tr><td>iv) Above 40 & upto 55 mm</td><td>1.4 mm thick GS formed wire / 2.5 mm dia GS wire.</td></tr><tr><td>v) Above 55 & upto 70 mm</td><td>1.4 mm thick GS formed wire / 3.15 mm dia GS wire.</td></tr><tr><td>vi) Above 70 mm</td><td>1.4 mm thick GS formed wire / 4.0 mm dia GS wire</td></tr></tbody></table></div> <div>The gap between armour wires / formed wires shall not exceed one armour wire / formed wire space and there shall be no cross over / over - riding of armour wire / formed wire. The minimum area of coverage of armouring shall be 90 %. The breaking load of armour joint shall not be less than 95 % of that of armour wire / formed wire. Zinc rich paint shall be applied on armour joint surface of G.S wire / formed wire.</div>				Calculated nominal dia Of cable under armour	Size and Type of armour	i) Upto 13 mm	1.4 mm dia GS wire.	ii) Above 13 & upto 25 mm	0.8 mm thick GS formed wire / 1.6 mm dia GS wire.	iii) Above 25 & upto 40 mm	0.8 mm thick GS formed wire / 2.0 mm dia GS wire	iv) Above 40 & upto 55 mm	1.4 mm thick GS formed wire / 2.5 mm dia GS wire.	v) Above 55 & upto 70 mm	1.4 mm thick GS formed wire / 3.15 mm dia GS wire.	vi) Above 70 mm	1.4 mm thick GS formed wire / 4.0 mm dia GS wire
Calculated nominal dia Of cable under armour	Size and Type of armour																		
i) Upto 13 mm	1.4 mm dia GS wire.																		
ii) Above 13 & upto 25 mm	0.8 mm thick GS formed wire / 1.6 mm dia GS wire.																		
iii) Above 25 & upto 40 mm	0.8 mm thick GS formed wire / 2.0 mm dia GS wire																		
iv) Above 40 & upto 55 mm	1.4 mm thick GS formed wire / 2.5 mm dia GS wire.																		
v) Above 55 & upto 70 mm	1.4 mm thick GS formed wire / 3.15 mm dia GS wire.																		
vi) Above 70 mm	1.4 mm thick GS formed wire / 4.0 mm dia GS wire																		
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		 A4-10		<div>CE/416/SURAT/CBL/CC/TR</div> <div>REV 00</div> <div>PAGE 04 OF 08</div>
		2.07.00 Outer sheath shall be of PVC type ST1 as per IS: 5831 & Black in colour. In addition to meeting all the requirements of Indian standards referred to, outer sheath of all the cables shall have the following FRLS properties.		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED . IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY. </p>		<div>(a) Oxygen index of min. 29 (As per ASTM D 2863).</div> <div>(b) Temperature index of min 250 °C (As per ASTM D 2863)</div> <div>(c) Acid gas emission of max. 20 % (As per IEC - 754 - I).</div> <div>(d) Smoke density rating shall not be more than 60 % during Smoke Density test as per ASTM D - 2843.</div>		
		2.08.00 Outer sheath material shall have resistance to water, UV radiation, fungus, rodent and termite attack.		
		2.09.00 Cores of the cables shall be identified by colouring of insulation. Following colour scheme shall be adopted : <div> <div>1 Core - Red, Black, Yellow & Blue.</div> <div>2 Core - Red & Black.</div> <div>3 Core - Red, Yellow & Blue.</div> <div>4 Core - Red, Yellow, Blue & Black.</div> <div>5 Core - Red, Yellow, Blue, Black & grey.</div> </div> <p>For cables having more than 5 cores, core identification shall be done by numbering the insulation of cores sequentially, starting by number 1 in the inner layer (e.g. say for 10 core cable, core numbering shall be from 1 to 10). The number shall be printed in Hindu-Arabic numerals on the outer surfaces of the cores. All the numbers shall be of the same color, which shall contrast with the color of insulation. The color of insulation for all the cores shall be grey only. The numerals shall be of legible and indelible. The numbers shall be repeated at regular intervals along the core, consecutive numbers being inverted in relation to each other. When the number is a single numeral, a dash shall be placed underneath it. If the number consists of two numerals, these shall be disposed one below the other and a dash placed below the lower numeral. The spacing between consecutive numbers shall not exceed 50 mm.</p>		
		2.10.00 In addition to manufacturer's identification on cables as per IS, following marking shall also be provided over outer sheath.		
		<div>(a) Cable size, voltage grade & RRVUNL – To be embossed.</div> <div>(b) Word 'FRLS' at every 5 meter – To be embossed.</div> <div>(c) Sequential marking of length of the cable in meters at every one meter - To be embossed / printed.</div> <p>The embossing / printing shall be progressive, automatic, in line and marking shall be legible and indelible.</p>		

TECHNICAL SPECIFICATION OF POWER CABLE

		 A4-10		CE/416/SURAT/CBL/CC/TR REV 00 PAGE 05 OF 08
		<p>2.10.00 All cables shall meet the fire resistance requirement of IEEE – 383 with cable installations made in accordance with clause “Flammability test” and as per category-B of IEC 332 Part – 3.</p>		
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		<p>2.11.00 In plant repairs to the cables shall not be accepted. Pimples, fish eye, blow holes etc. are not acceptable.</p>		
		<p>3.00.00 CABLE DRUMS</p> <p>(d) Cables shall be supplied in non-returnable wooden or steel drums of heavy constructions. The surface of the drum and the outer most cable layer shall be covered with water proof layer. Both the ends of the cables shall be properly sealed with heat shrinkable PVC / rubber caps secured by ‘U’ nails so as to eliminate ingress of water during transportation storage and erection. Wood preservative anti - termite treatment shall be applied to the entire drum. Wooden drums shall comply with IS : 10418.</p> <p>(e) Each drum shall carry manufacturer’s name, purchaser’s name, address and contact number, item number and type, size and length of cable and net gross weight stenciled on both sides of the drum. A tag containing same information shall be attached to the leading end of the cable. An arrow and suitable accompanying wording shall be marked on one end of the reel indicating the direction in which it should be rolled.</p>		
		<p>4.00.00 TESTS</p> <p>(a) All cables to be supplied shall be of type tested quality. The vendor shall submit for BHEL/BHEL’s customer approval the reports of all the type tests as listed in this specification and carried out within last five years from the date of bid opening/ Reverse auction. These reports should be for the tests conducted on the same type of cable to those proposed to be supplied under this PO and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.</p> <p>(b) In case the Vendor is not able to submit report of the type test(s) conducted within last five years from the date of bid opening/Reverse auction or in case the type test report(s) are not found to be meeting the specification requirements, the Vendor shall conduct all such tests under this contract free of cost to BHEL and submit the reports for approval.</p> <p>(c) All acceptance and routine tests as specified below and in relevant standards shall be carried out. Charges for these shall be deemed to be included in the cable price.</p>		



REV 00

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All cables to be supplied will be of type tested quality. The list of type tests applicable for cables is given in table below this clause. The vendor shall submit the reports of all the type tests listed in the below table for each size & type of cable under the supply (for each variety) for Customer/BHEL approval. The reports should be of type tests conducted within 5 years. The type tests should have been either conducted at an independent laboratory or should have been witnessed by a client. The type test reports in compliance to these requirements shall be submitted for Customer/BHEL approval. In case the vendor is not able to submit type test reports of earlier conducted type tests in compliance to above requirements, or, the type test reports submitted by the vendor is not approved/not accepted by Customer/BHEL, then the vendor shall conduct all such tests and submit the reports for Customer/BHEL approval

TYPE TESTS FOR CONTROL CABLES				
Sl. No.	Component	Test	Standard	Remarks
1	For Conductor (including drain wire)	Resistance test	VDE-0815	
2		Diameter test	IS-10810	
3		Annealing test		
5	For PVC Insulation and PVC Sheath (Inner & Outer)	Test for Thickness	IS-10810	
6		Tensile Strength & Elongation (before & after ageing)	IS-10810	
7		Ageing in air ovens	IS-10810	
8		Loss of mass	IS-10810	
9		Hot deformation	IS-10810	
10		Heat shock	IS-10810	
11		Shrinkage	IS-10810	
12		Color fastness to water	IS-5831	Only for outer sheath
13		Bleeding & Blooming	IS-10810	
14		Cold bend/ Cold impact test	VDE-0472	
15		Thermal stability test		
16		Volume resistivity & water immersion test (at room & elevated temperature)		
17		Oxygen Index & Temperature Index Test	ASTMD-2863	Test is to be conducted for fillers too as and where applicable.
18		Smoke Density Rating Test	ASTMD-2843	
19		Acid gas generation test	IEC-60754-1	

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TECHNICAL SPECIFICATION OF POWER CABLE



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Sl. No.	Component	Test	Standard	Remarks
20	For Armoring	Tensile Strength		Only for armored cables
21		Elongation		
22		Winding / Torsion test		
23		Resistivity		
24		Dimensions		
25		Uniformity of zinc coating		
26		Dip test		
27		Mass of zinc coating		
28	For Completed cables	Constructional Details (Conductor - number of strands & diameter of strands, Thickness of Insulation and Sheath, Dia of Armor, overall diameter, color & marking on outer sheath, numbering of pairs, core color, band marking, unit identification, visual & surface finish etc.)	IS-10810	
29		Insulation resistance		
30		Thermal EMF test		
31		High Voltage test	VDE-0815	
32		Noise Interference	IEEE Transactions	
33		Flammability test	IEEE-383, IEC-332-3	
34		Swedish Chimney test	SEN-4241475	
35		Drain wire continuity		
36		Anti-rodent, anti-termite, anti-fungus, moisture retardant test on sheath		
37		UV radiant test & Hydraulic Stability test	As per DIN 53387	



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4.02.0 Acceptance Tests

Following Acceptance tests shall be carried out on each type and size of the cables on the cable drums selected at random as per following sampling plan :

SL. NO.	NUMBER OF DRUMS OF DRUMS IN THE LOT	NO OF DRUMS TO BE TAKEN AS SAMPLE (n)	PERMISSIBLE NO OF DEFECTIVE (a)
01.	Upto 50	2	0
02.	51 to 100	5	0
03.	101 to 300	13	0
04.	301 to 500	20	1
05.	501 & above	32	2

ACCEPTANCE TESTS FOR CONTROL CABLES

Sl. No	Component	Test	Standard	Remarks
1	Constructional details	Conductor Diameter, Thickness of Insulation and Sheath, Dia of Armour, overall diameter, marking on outer sheath, band marking, numbering of cores, colour.	As per relevant standard/ approved DS	
2	PVC Insulation & Sheath	Tensile Strength & elongation test		Before& After ageing
		Thermal stability test		
3	FRLS properties test	Oxygen index & temperature index test		
		Smoke density rating		
		Acid gas generation test		
4	Armoring	Mass of zinc coating test		Only for armored cables.
		Torsion/Winding test		
		Dip test		
		Resistivity		
5	Completed cables	Insulation resistance test		
		Conductor resistance test (cable & Drain wire)		
		High Voltage test		
		Persulphate test (for drain wire)		
		Flammability test		
		Swedish chimney test (Overall cable)		
		Length checking		
		Visual & Surface finish		

4.03.00 Routine Tests

Routine tests shall be carried out for each drum of cables of all sizes. Following shall constitute routine tests :

Sl. No. 1 & 31 of list of type tests specified at clause no. 4.01.01 (i) in this chapter.

TECHNICAL SPECIFICATION OF INSTRUMENTATION CABLE:

Refer this specification for 2P / 4P etc cable, if required, for CCTV and access control system



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1) General Requirements:

Sl. No.	Description	Technical Requirement
1.1	Codes and Standards	All cables shall comply with BS 50288 Part-7, SEN-4241475, ANSI MC 96.1, IS-1554, IS-8130, IS-5831, IS-3975, ASTM D-2863 & 2843, IEC-754-1, IEC 60189, IEC 60584, IEC-332-3 CAT C, IEEE-383, SS-424-1475, IS-8784, IS-10810, IS-10418 (latest editions) and their amendments.
1.2	Voltage Grade	As per SOS.
1.3	Continuous operation suitability	At 70 deg. C
1.4	Progressive automatic on-line sequential marking of length in meters	To be provided at every 1 meter on outer sheath
1.5	Marking to read 'FRLS'	To be provided at every 1 meter on outer sheath
1.6	Allowable tolerance on overall diameter	±2 mm (max.) over the declared value in datasheet
1.7	Variation in diameter	Not more than 1.0 mm throughout the length of cable
1.8	Ovality at any cross section	Not more than 1.0 mm
1.9	Marking on outer sheath	Durable marking/embossing at intervals not exceeding 625 mm shall include manufacturer's name, insulation material, FRLS, RRVUNL, conductor's size, number of pairs/cores, voltage rating, type of cable (analog or binary), year of manufacture, Drum or lot number to be provided
1.10	Overall Quantity Tolerance	+2%, -0% (Negative values are not acceptable)
1.11	Others	<p>Cables shall be suitable for crimping, screw termination or cage clamp type screw less terminal blocks, laying in conduits, ducts, trenches, racks and underground-buried installation with chances of flooding by water</p> <p>Repaired cables shall not be acceptable</p> <p>All cables shall be anti-rodent, anti-termite, moisture-retardant & fungus-retardant type.</p> <p>Rip cord shall be provided under inner sheath for all cables.</p>



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2) Technical Requirements:

Sl. No	Specification Requirement	Kx Type	Rx Type	Individual & Overall Shielded (Type-F)	Overall Shielded (Type-G)
A Conductors					
i	Cross section Area (sq.mm)	0.5			
ii	Conductor material	ANSI type Kx (Cr-Al)	ANSI type Rx (Cu—Cu-Ni)	High conductivity Annealed Tinned copper	
iii	Color code	Yellow-Red	Black-Red	As per IEC 60189 - 2 2T-Red/Red/White, also numbering on each core of each triad	
iv	Numbering on each core	Numbering on each core at an interval of 100 mm or less in cores of multipair cable			
v	Conductor grade	As per ANSI MC96.1		Electrolytic	
vi	No & dia. of strands	Solid Conductor		7 X 0.3 mm (nom)	
vii	No of pairs	2		2,4, 8, 12,16,24,48	
viii	Max conductor resistance per Km(in ohm) at 20 ° C	2162 ohm/Km (loop)		40.9 ohm/Km	
	Reference standard	As per ANSI MC 96.1, IEC 60584		BS 50288 Part 7	
B Insulation					
i	Material	Extruded PVC type A as per IS 5831/84			
ii	Thickness in mm (Nom)	0.6			
iii	Volume resistivity (min) in ohm-cm	1 X 10 ¹⁴ at 20° C & 1 X 10 ¹¹ at 70° C			
iv	Reference standard	BS 50288 Part 7			
V	Core diameter above insulation	Suitable for cage clamp connector			

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Sl. No	Specification Requirement	Kx Type	Rx Type	Individual & Overall Shielded (Type-F)	Overall Shielded (Type-G)		
C	Pairing and Twisting						
i	Max lay of pairs/triads(mm)	20 twists/meter (All pairs twisted in same direction. Lapped to form bunch with mylar tape)					
ii	Single layer of numbered binder tape on each pair/triad provided	Numbered Tape		Yes			
iii	Unit formation of four pairs with printing of no. of unit provided	NA		Yes, As per IEC 60189			
D	Shielding						
i	Type of shielding	Al-Mylar shielding					
ii	Individual pair shielding	To be provided			No		
iii	Minimum thickness of individual pair shielding	24 micron			NA		
iv	Overall cable assembly shielding	To be provided					
v	Minimum thickness of overall cable assembly shielding	40 micron					
vi	Shielding coverage	100% with at least 25% overlap					
vii	Drain wire provided for individual shield	Yes (for F-type), 7-strand 20 AWG (0.51 sq.mm) Annealed Tin coated Copper			NA		
viii	Drain wire provided for overall shield	Yes, 7-strand 20 AWG (0.51 sq.mm) Annealed Tin coated Copper					

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Sl. No	Specification Requirement	Kx Type	Rx Type	Individual & Overall Shielded (Type-F)	Overall Shielded (Type-G)
ix	Metallic side of screen	Metallic side of screen shall be in contact with drain wire			
X	Binder tape	Non-Hygroscopic polyester tape of thickness min of 0.023 mm applied helically with 50% overlap.			
E	Fillers (if applicable)				
i	Non-Hygroscopic flame & moisture retardant	To be provided for circular shape			
F	Outer sheath				
i	Material	Extruded PVC compound ST1 with FRLS properties as per IS 5831			
ii	Reference standard	As per BS 50288 Part 7			
iii	Minimum thickness at any point	As per BS 50288 Part 7			
iv	Nominal thickness at any point	As per BS 50288 Part 7			
v	Color	Yellow	Blue	Blue	
vi	Resistance to water, fungus, termite & rodent attack& UV	Outer sheath material shall have resistance to water, UV radiation, fungus, rodent and termite attack.			
vii	Oxygen index as per ASTMD-2863	Not less than 29 %			
viii	Temperature index as per ASTMD 2863	Not less than 250 ° C			
ix	Acid Gas generation by weight as per IEC - 60754-1	Maximum 20 %			
x	Smoke density rating as per ASTMD 2843	Maximum 60 % (defined as the average area under the curve when the results of smoke density test plotted on a curve indicating light absorption vs. time as per ASTMD 2843)			

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Sl. No	Specification Requirement	Kx Type	Rx Type	Individual & Overall Shielded (Type-F)	Overall Shielded (Type-G)				
G	Inner sheath (only for armored cables)								
i	Material	Extruded PVC type ST1 as per IS 5831/84							
ii	Reference standard	As per BS 50288 Part 7							
iii	Minimum thickness at any point	As per BS 50288 Part 7							
iv	Nominal thickness at any point	As per BS 50288 Part 7							
v	Color	Black							
vi	Resistance to water, fungus, termite & rodent attack	Required							
H	Armoring (wherever applicable)								
i	Armoring as per G.I. Wire/Strip as per As per BS 50288 Part-7. (The gap between armor wires/formed wires shall not exceed one armor wire/formed wire space and there shall be no cross over/over-riding of armor wires/formed wires. The minimum area of coverage of armoring shall be 90%. The breaking load of armor joint shall not be less than 95% of that of armor wire/formed wire. Zinc rich paint shall be applied on armor joint surface of GS wires/formed wires.)								
I	Electrical parameters (at 20 deg. C)								
i	Maximum Mutual capacitance between conductors at 0.8 KHz	120 nF/km							
ii	Maximum Mutual capacitance between Core and shield	450 nF/Km							
iii	Insulation Resistance (min)	500 M ohm/km							
iv	Cross talk figure (min) at 0.8 KHz	60 dB							

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TECHNICAL SPECIFICATION OF INSTRUMENTATION CABLE

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Sl. No	Specification Requirement	Kx Type	Rx Type	Individual & Overall Shielded (Type-F)	Overall Shielded (Type-G)
v	Characteristic impedance (max) at 1 KHz	NA		320 ohm	340 ohm
vi	Attenuation figure at 1 KHz(max)	NA		1.2 dB/km	
vii	Thermal EMF calibration	As per IEC 60584-3 Cl 2		NA	
viii	Test Voltage	Core to core: 2.0 KV for 1 Min; Core to screen : 1000 V for 1 Min; Screen to armour: 500 V for 1 Min			
J	Complete cable				
i	Complete cable assembly	Shall pass Swedish chimney test as per SEN-SS 4241475 class F3			
ii	Flammability	Shall pass flammability as per IEC-332-3,Cat C,IEEE 383 & SS 424 1475 read in conjunction to this specification			
K	Tests				
i	Refer to Clause No. 5 under CE/416/SURAT/CBL/IC-TC/TR				
L	Cable drum				
i	Type	The drum shall be non-returnable wooden drum (As per IS 10418) of suitable size and packed (wooden drum to be constructed from seasoned wood free from defects with wood preservative applied to the entire drum) The ends of the cable shall be sealed by means of non-hygroscopic sealing material. Drum shall be anti-rodent, anti-termite smooth finish. Both ends of the cable shall be capped by means of non-hygroscopic sealing material.			
ii	Outer most layer covered with water proof paper	Yes			
iii	Painting	Entire surface to be painted			
iv	Length	1000 m \pm 5% for up to & including 12 pairs 500 m \pm 5% for above 12 pairs Balance quantity to be provided as a separate drum (The cable is to be provided separately against each unit of the project and therefore balance quantity to complete the supply under each unit of the project shall be provided as a separate drum)			
v	Recommended min Bending Radius	15 X Overall dia of completed cables			
Vi	Marking on Drum	The drum shall be marked up with the following information: Reference standard, manufacturer's name, type of cable and voltage grade, number of pairs, cross-sectional area of conductor, length of cable on drum, number of lengths on drum (if more than one) direction of rotation, approximate gross weight, country and year of manufacture etc.			

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		<p>3) TESTS</p> <p>3.1) All cables shall be subject to Routine, Acceptance & Type Tests in line with the requirements under this specification.</p> <p>3.2) <u>Type Tests for Instrumentation & Thermocouple Cables</u></p> <p>3.2.1) All Instrumentation & Thermocouple cables to be supplied shall be of type tested quality. The list of type tests applicable for Instrumentation & Thermocouple cables is given in table below this clause. The vendor shall submit the reports of all the type tests listed in the below table for each size & type of cable under the supply (for each variety) for Customer/BHEL approval. The reports should be of type tests conducted within 5 years. The type tests should have been either conducted at an independent laboratory or should have been witnessed by a client. The type test reports in compliance to these requirements shall be submitted for Customer/BHEL approval. In case the vendor is not able to submit type test reports of earlier conducted type tests in compliance to above requirements, or, the type test reports submitted by the vendor is not approved/not accepted by Customer/BHEL, then the vendor shall conduct all such tests and submit the reports for Customer/BHEL approval.</p>																													
<p style="text-align: center;">COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BIHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.</p>		<table border="1" data-bbox="532 1066 1425 1360"> <thead> <tr> <th colspan="5">TYPE TESTS FOR INSTRUMENTATION & THERMOCOUPLE CABLES</th></tr> <tr> <th>Sl. No.</th><th>Component</th><th>Test</th><th>Standard</th><th>Remarks</th></tr> </thead> <tbody> <tr> <td>1</td><td rowspan="8">For Conductor (including drain wire)</td><td>Resistance test</td><td>VDE-0815</td><td></td></tr> <tr> <td>2</td><td>Diameter test</td><td>IS-10810</td><td></td></tr> <tr> <td>3</td><td>Tin coating test (Persulphate test)</td><td>IS-8130</td><td></td></tr> <tr> <td>4</td><td>Annealing test</td><td></td><td></td></tr> </tbody> </table>			TYPE TESTS FOR INSTRUMENTATION & THERMOCOUPLE CABLES					Sl. No.	Component	Test	Standard	Remarks	1	For Conductor (including drain wire)	Resistance test	VDE-0815		2	Diameter test	IS-10810		3	Tin coating test (Persulphate test)	IS-8130		4	Annealing test		
TYPE TESTS FOR INSTRUMENTATION & THERMOCOUPLE CABLES																															
Sl. No.	Component	Test	Standard	Remarks																											
1	For Conductor (including drain wire)	Resistance test	VDE-0815																												
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4		Annealing test																													



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Sl. No.	Component	Test	Standard	Remarks
5	For PVC	Test for Thickness		
6	Insulation and PVC Sheath (Inner & Outer)	Tensile Strength & Elongation (before & after ageing)	BS-EN 50288-7	
7		Ageing in air ovens	VDE-0472	
8		Loss of mass	VDE-0472	
9		Hot deformation	VDE-0472	
10		Heat shock	VDE-0472	
11		Shrinkage	VDE-0472	
12		Color fastness to water	IS-5831	Only for outer sheath
13		Bleeding & Blooming	IS-10810	
14		Cold bend/ Cold impact test	VDE-0472	
15		Thermal stability test		
16		Volume resistivity & water immersion test (at room & elevated temperature)	BS-EN 50288-7	
17		Oxygen Index & Temperature Index Test	ASTMD-2863	
18		Smoke Density Rating Test	ASTMD-2843	
19		Acid gas generation test	IEC-60754-1	
20		Oxygen index & Temperature index test for fillers	ASTMD-2863	
21		Acid gas generation test for fillers	IEC-60754-1	
22	For Al-Mylar Shield	Continuity test		
23		Shield thickness test		
24		Overlap & coverage test		
25	For Armoring	Tensile Strength		Only for armored cables
26		Elongation		
27		Winding / Torsion test		
28		Resistivity		
29		Dimensions		
30		Uniformity of zinc coating		
31		Dip test		
32		Mass of zinc coating		
33		Tightness and gap test		

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Sl. No.	Component	Test	Standard	Remarks
33	For Completed Cable	Constructional Details (Conductor & drain wire - number of strands & diameter of strands, Twisting & Lay of pairs Thickness of Insulation and Sheath, Dia of Armor, overall diameter, color & marking on outer sheath, numbering of pairs, core color, band marking, unit identification, visual & surface finish, ovality etc.)	BS-EN 50288-7	
34		Electrical Parameters (Mutual capacitance, Cross talk, Attenuation, L/R ratio, Characteristic Impedance etc. as applicable)	BS-EN 50288-7	Only for instrumentation & Thermocouple cables.
35		Insulation resistance	-do-	
36		Thermal EMF test	ANSI MC 96.1	Only for T/C cables.
37		High Voltage test	BS-EN 50288-7	
38		Noise Interference	IEEE Transactions	
39		Flammability test	IEEE-383, IEC-332-3-CAT C	Also refer to clause 5.3.3 below
40		Swedish Chimney test	SEN-4241475	
41		Drain wire continuity		
42		Anti-rodent, anti-termite, anti-fungus, moisture retardant test on sheath		
43			UV radiant test & Hydraulic Stability test	As per DIN 53387

3.2.2) With respect to the list of type tests in above table, relevant standards/reference document shall be referred to by the vendor in case there is no standard listed against any test(s) or the listed standard is not relevant/complete reference to the test(s) in context of this supply.

3.3. Acceptance Tests

3.3.1) For these tests, the selection of cable drums shall be at random, as per the following sampling plan.


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SL. NO.	NUMBER OF DRUMS OF DRUMS IN THE LOT	NO OF DRUMS TO BE TAKEN AS SAMPLE (n)	PERMISSIBLE NO OF DEFECTIVE (a)
01.	Upto 50	2	0
02.	51 to 100	5	0
03.	101 to 300	13	0
04.	301 to 500	20	1
05.	501 & above	32	2

ACCEPTANCE TESTS FOR INSTRUMENTATION, THERMOCOUPLE CABLES				
Sl. No	Component	Test	Standard	Remarks
1	Constructional details	Conductor Diameter, Thickness of Insulation and Sheath, Dia of Armour, Shield Thickness, Coverage and overlap of shield, overall diameter, marking on outer sheath, band marking, numbering of pairs, colour, continuity of drain wire, etc	As per relevant standard/ approved DS	
2	Electrical parameters	Mutual Capacitance (between core to core & core to shield, L/R Ratio)		Only for IC & TC cable.
		Cross talk		
		Characteristic impedance		
		Attenuation		
3	PVC Insulation & Sheath	Tensile Strength & elongation test		Before & After ageing
		Thermal stability test		
4	FRLS properties test	Oxygen index & temperature index test		
		Smoke density rating		
		Acid gas generation test		
5	Armoring	Mass of zinc coating test		Only for armored cables.
		Torsion/Winding test		
		Dip test		
		Resistivity		
6	Completed cables	Insulation resistance test		
		Conductor resistance test (cable & Drain wire)		
		High Voltage test		
		Persulphate test (for drain wire)		
		Flammability test		
		Swedish chimney test (Overall cable)		
		Length checking		
		Visual & Surface finish		
		Thermal EMF test (for T/C cable)		

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		<p>3.3.3) Flammability Test</p> <ol style="list-style-type: none"> a) This test shall be carried out as per IEEE-383, IEC— 332 part I and III. The instrumentation cables installation to be tested shall consist of as many instrumentation cables as necessary to give at least 10 Kg of Organic material per meter. The cables in the installation can be of any (or all) of the various types specified. However in case of failure to pass this test, the whole lot shall be subjected to rejection. b) The size of the cables (measured by total cross sectional area of the conductor) shall be that which has maximum organic material per sq.mm of total cross sectional area of all the conductors. <p>3.4) <u>Routine Tests</u></p> <p>The routine tests for Instrumentation & Thermocouple Cables shall consist of the tests under Sl. No. 1, 35, 37 & 41 under the list of type tests in clause no. 3.2 above and are to be done on 100% drums.</p> <p>3.5) The list of tests as given under sub clauses of clause 3 of this specification (above) has been prepared in line with Customer specification, however, these lists are for general/broad guidance of vendor, and the final list of tests with other details related to tests shall be as per the Customer/BHEL approved documents - approved Quality Plan & Datasheet.</p> <p>3.6) Bidder shall include in his total bid price, the cost of carrying out all the type tests, if required; charges for conducting each of the type test shall be indicated separately for each type and size of the cables in the relevant bid proposal sheets and the total charges included in the bid price.</p> <p>BHEL/Customer at their discretion may ask the bidder to conduct any or all the type tests for which at least 15 days advance notice shall be given by the bidder. Charges for acceptance and routine tests shall be deemed to be included in the bid price of individual cables.</p> <p>3.7) BHEL/Customer reserves the right to get the cables, type tested at their own expenses for any further tests to verify the compliance with the specifications. However BHEL/Customer reserves the right to waive any of the type tests in which case the test charges quoted will be taken for adjustment purposes.</p>		
		<p>3.8) <u>TEST CERTIFICATES</u></p> <p>The equipment/material shall be satisfactory & completely factory tested before shipment in accordance with the latest standards available. The tests specified in technical specification and/or any other tests which may be necessary to ensure that the equipment/material is satisfactory, shall be also be conducted. BHEL/Customer shall be supplied with certified test reports along with oscillograms if any, of all tests carried out on equipment/material</p>		

ANNEXURE – 10

LIST OF APPROVED SUB-VENDORS

LIST OF APPROVED VENDORS FOR SUB ITEMS OF CCTV AND ACCESS CONTROL SYSTEM	
Instrumentation Cable	
1)	M/S ASSOCIATED CABLES PVT LTD, MUMBAI (L402145)
2)	M/S POLYCAB WIRES, DAMAN (S405921)
3)	M/S GEMSCAB INDUSTIRIES LTD, BHIWADI (M306280)
4)	M/S DELTON CABLES, FARIDABAD. (M113843)
5)	M/S CORDS CABLE, BHIWADI (S113927)
6)	M/S SKYTONE ELECTRICALS (I) LTD (X124000)
7)	M/S GENERAL INSTRUMENTS CONSORTIUM (M602312)
8)	M/S UDEY PYRO CABLES, MUMBAI (OTI0159)
9)	M/S KEI INDUSTRIES, CHENNAI(X404186)
10)	M/S PARAMOUNT COMMUNICATIONS LTD., ALWAR (X114324)
11)	M/S THERMO CABLES LTD., HYDERABAD (S506199)
Power cable	
1)	M/S THERMO CABLES LTD., HYDERABAD (S506199)
2)	M/S KEI INDUSTRIES, CHENNAI(X404186)
3)	M/S PARAMOUNT COMMUNICATIONS LTD., ALWAR (X114324)
4)	M/S CORDS CABLE, BHIWADI (S113927)
5)	M/S NICCO CORPORATION LTD., KOLKATA (X704371)
6)	M/S POLYCAB WIRES, DAMAN (S405921)
7)	M/S FINOLEX CABLES, PUNE (X412375)
8)	M/S KEC INTERNATIONAL LTD, BANGALORE (L403610)
9)	M/S TORRENT CABLES LTD (X384446)
10)	M/S UNIVERSAL CABLES LTD (X483657)
11)	M/S DELTON CABLES, FARIDABAD. (M113843)
12)	M/S Cable Corporation of India Ltd(CCI) (X404370)
13)	M/S ISHWAR METAL INDUSTRIES, JAIPUR (OTICA00095)
14)	M/S ISHWAR CABLES PVT LTD (OTICA00096)
15)	M/S DAKSHA (OTI0158)
16)	M/S TIRUPATI (OTICA00097)
17)	M/S ROMESH POWER PRODUCTS PVT LTD (OTICA00099)
18)	M/S ALPHA COMMUNICATION (OTICA00098)
19)	M/S GEMSCAB INDUSTIRIES LTD, BHIWADI (M306280)
FO cable:	
1.	Birla Erricson
2.	Aksh Fibre
3.	D-Link
4.	Finoles (Pune / Goa)
SERVER AND WORK STATION	
IBM	
HP	
DELL	
PRINTER	
HP	

Xerox
40" TFT MONITOR
Sony
Samsung
LG
42U PANEL
Automation Pvt Ltd
C&S Electric Ltd, New Delhi
Chemin
Electric Automation
ENPRO Industrial
IL, Kota
Industrial Controls & Appliances Pvt Ltd
J&H
Pyrotech ,Udaipur
Rittal India Pvt Ltd,Bangalore
WALL MOUNTABLE PANELS
Electric Automation
Industrial Controls
Vidyut Controls
Pyrotech
Industrial Control Appliances
Positronics
Automatic Electric
MECO
Rishabh Instruments

For all other items whose make are not mentioned in technical specification and above, the offered make shall be reputed and supplied & commissioned earlier in power/process industry.

ANNEXURE – 11

BILL OF MATERIALS

SL.	ITEM DESCRIPTION	UOM	QUANTITY
	Perimeter Intrusion detection system- BOM		
1	Redundant server with 22" monitor, mouse, keyboard & other required accessories	SET	1
2	Client Work Station with 22" monitor, keyboard & mouse with PTZ control units and necessary software licenses.	SET	1
3	A3 laser colour printer	NO	1
4	Digital Video Management, Motion Detection System and Video Analytic software	NO	1
5	40" TFT LCD monitor for large video display	NO	2
6	Network Access Storage (NAS) with accessories	NO	1
7	Fixed cameras with housing and other accessories (as per technical specification)	NO	70
8	L3 Core Switch (meeting specification)	SET	1
9	L2 Field network switches for connecting FO cable at one end to 2 cameras along plant boundary (with surge protective devices & IP65 protection)	NO	35
10	42U panel for housing the server, network switch etc in security room	LOT	1
11	6 core Single mode armoured OFC cable	MTRS	11000
12	Twisted 4 pair STP CAT6 cable and connectors for connecting field switch to cameras	MTRS	2000
13	3C 1.5Sqmm un-armoured power cable for camera end connection	MTRS	2000
14	3C 2.5Sqmm Armoured power cable for looping around perimeter	MTRS	10000
15	Passive Fiber Optic Components and termination kit consisting of .Fiber panel, Information outlet, Cabinets, LIU, face plates, SC Coupler, Fiber Optic Drawer with Pigtail, UTP CAT6 Patch cords, various connectors, cable ties, Multi strand Copper wire for grounding of equipment.	LOT	1
16	25mm PVC Conduit with coupler and other accessories between JB to camera	MTRS	2000
17	Permanently lubricated HDPE PIPE of suitable cross section with coupler and other accessories for routing Power & FO cable underground along perimeter	MTRS	10000
18	Earthing system for Servers and also for cameras	LOT	1
19	Power distribution boards for distributing power supplied to camera from UPS/CCTV Panel/PDB	LOT	1
20	6mtrs GI Poles suitable for mounting Camera and related JB etc	NO	30
21	Any other supply item not covered above but required for completion of the system (Bidder to mention the items clearly in their offer)	SET	1
22	Any other item mentioned in technical specification and not covered above	SET	1
23	Training charges	SET	1
24	Engineering, Design, Documentation, Testing, Erection, installation & commissioning	SET	1
	CCTV system- BOM		
1	Redundant server with 22" monitor, mouse, keyboard & other required accessories	SET	1
2	Client Work Station with 22" monitor, keyboard & mouse with PTZ control units and necessary software licenses.	SET	6
3	A3 laser colour printer	NO	1
4	Digital Video Management, Motion Detection System and Video Analytic software	NO	1
5	40" TFT LCD monitor for large video display	NO	3
6	Network Access Storage (NAS) with accessories	NO	1
7	PTZ cameras with housing and other accessories (as per technical specification)	NO	170
8	L3 Core Switch (meeting specification)	SET	1
9a.	L2 Field network switches for connecting FO cable at one end to individual Cameras in power plant (with surge protective devices & IP65 protection)	NO	25
9b.	L2 Field network switches for connecting FO cable at one end to group of 5-6 Cameras in power plant (with surge protective devices & IP65 protection)	NO	30
10	42U panel for housing the server, network switch etc in security room	LOT	1
11	6 core Single mode armoured OFC cable	MTRS	15000
12	Twisted 4 pair STP CAT6 cable and connectors for connecting field switch to cameras	MTRS	4500
13	3C 1.5Sqmm un-armoured power cable for camera end connection	MTRS	2000
14	3C 2.5Sqmm Armoured power cable	MTRS	15000
15	Passive Fiber Optic Components and termination kit consisting of .Fiber panel, Information outlet, Cabinets, LIU, face plates, SC Coupler, Fiber Optic Drawer with Pigtail, UTP CAT6 Patch cords, various connectors, cable ties, Multi strand Copper wire for grounding of equipment.	LOT	1
16	25mm PVC Conduit with coupler and other accessories between JB to camera	MTRS	2000
17	Permanently lubricated HDPE PIPE of suitable cross section with coupler and other accessories for routing Power & FO cable underground in power plant	MTRS	2000
18	Earthing system for Servers and also for cameras	LOT	1
19	Power distribution boards for distributing power supplied to camera from UPS/CCTV Panel/PDB	LOT	1
20	6mtrs GI Poles suitable for mounting Camera and related JB etc	NO	10
21	Any other supply item not covered above but required for completion of the system (Bidder to mention the items clearly in their offer)	SET	1
22	Any other item mentioned in technical specification and not covered above	SET	1
23	Training charges	SET	1
24	Engineering, Design, Documentation, Testing, Erection, installation & commissioning	SET	1

	Access Control System- BOM		
1	Redundant server with 22" monitor, mouse, keyboard & other required accessories	SET	1
2	Client Work Station with 22" monitor, keyboard & mouse and necessary software licenses.	SET	1
3	A3 laser colour printer	NO	1
5	HID card reader with electromagnetic door locks	NO	94
6	Long range card reader	NO	12
7	Access card	NO	3000
8	Access card controller (with 10% or min 2nos spare)	LOT	1
9	ID card printer with web camera	NO	2
10	Unarmoured Data cable of suitable number of core and cross section between Access Door to controller (Bidder to include FO cable if the same are required for their offered system. The distance between farthest controller to server shall be 1500mtrs)	MTRS	1000
11	Unarmoured Power cable of suitable number of core and cross section between Access Door/Gate / controller to power supply	MTRS	2000
12	Un Armoured data cable between Long range reader to Server	MTRS	1500
13a	Un Armoured data cable between HID card reader to Server	MTRS	1500
13b	Armoured FO cable for cabling between Server to HID's located at longer distance which can not be connected by data cable (If all HID can be connected using data cable in system offered by bidder, then bidder to quote armoured data cable under this item)	MTRS	5000
13	All other accessories including network switches, FO termination accessories, JB, PDB etc required for establishing connection between various card readers and controller as required to complete the system (Bidders to provide BOM breakup for all such items)	LOT	1
14	25mm PVC Conduit with coupler and other accessories between JB to camera	MTRS	2000
15	Permanently lubricated HDPE PIPE of suitable cross section with coupler and other accessories for routing Power & FO cable underground in power plant	MTRS	500
16	Any other supply item not covered above but required for completion of the system (Bidder to mention the items clearly in their offer)	SET	1
17	Any other item mentioned in technical specification and not covered above	SET	1
18	Training charges	SET	1
19	Engineering, Design, Documentation, Testing, Erection, installation & commissioning	SET	1
	B PATROL GUARD SYSTEM - BOM		
1	Patrol Guard PC, mouse, keyboard with all accessories at Central Control Room.	SET	1
2	Patrol Guard TAGS	NOS	50
3	Patrol Guard Card Reader	NO	10
4	Patrol Guard Data Collection and transfer unit	NO	10
5	Data Transfer cable with connector	NO	2
6	Patrol Guard Software	SET	1
7	Any other supply item not covered above required for completion of Patrol Guard system (mention the items with unit rate of each item)	SET	1
8	Engineering, design, documentation, testing, Erection, installation & commissioning of complete patrol guard monitoring system	SET	1
	Weather proof storage container to keep all electronic items of above four systems with lock and key.	LOT	1



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Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division
PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 003- Rev 00

SPECIAL COMMERCIAL CONDITIONS OF CONTRACT

Reference is brought to BHEL's Instructions to Bidders (Document Ref: CE: PR: 001- Rev 00) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 00). These documents along with required annexures are available in our website: _____. These two documents along with Special Conditions of Contract annexed to this RFQ will form an integral part of the contract as and when the RFQ culminates into a Purchase Order / Contract.

RFQ No: **HDC0000445**

RFQ Date: **XX.XX.2016**

Due Date: **REFER E-PROCUREMENT SYSTEM WEBSITE** Project: **RRVUNL-SURATGARH UNIT 7 & 8 (2X660MW)**

Item Description: SUPPLY AND E&C SUPPORT SERVICES FOR CCTV SYSTEM, PERIMETER INTRUSION DETECTION SYSTEM, ACCESS CONTROL SYSTEM & PATROL GUARD SYSTEM FOR RRVUNL SURATGARH PROJECT.

~~Purchase Executives:~~ In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand, the offers are to be handed over to either of the following Purchase Officers:

Shri CHANDRAIAH H D SENIOR MANAGER / PURCHASE CE MM PR

~~E-mail IDs:~~ In case offers are sent through E mail, please send the offers to both of the following email IDs:
chandraiah@bheledn.co.in

~~E-tendering:~~ **APPLICABLE.**

NOTE: QUANTITY UNIT RATES AND VALUE QUOTED IN EPS PORTAL ONLY WILL BE CONSIDERED FOR BID EVALUATION . SIMILARLY ANY DISCOUNTS GIVEN IN THE EPS PORTAL ONLY WILL BE CONSIDERED AND IF DISCOUNTS GIVEN IN ATTACHMENTS SAME WILL NOT BE CONSIDERED FOR BID EVALUATION.

Type of Bid : **Three part Bid** (Refer ITB for details)

~~Reverse Auction:~~ **Not Applicable** / Will be intimated during commercial clarifications to technically acceptable vendors.

In case BHEL does not resort to Reverse Auction, the price bids and price impacts (if any) shall be opened as per BHEL's standard practice.

~~Splitting of tendered quantity to MSE vendors:~~ The tendered quantity will **/will not** be split to MSE vendors subject to submission of relevant documents by vendors. **Refer clause H of Instructions to Bidders for conditions applicable and for information on documents to be submitted.**

Destination: Items are to be directly dispatched to BHEL's Site Office or Stores/Customer's Stores located at/near SHRI GANGANAGAR RAJASTHAN in STATE District/City in State. (Items to be delivered to SURATGARH SITE) State. Road Permit, if applicable, will be issued by BHEL along with Despatch Clearance.

For import portion of dispatches will be to Bangalore Airport.

Project Benefits:

- **Indigenous scope of supply:**
 - a) ~~Project is Mega Power Project or Ultra Mega Power Project: Eligible for "NIL" Excise Duty. Necessary documents for availing Excise Duty exemption by suppliers will be furnished by BHEL.~~
 - b) ~~Physical Export project: Eligible for complete exemption of Excise Duty & Sales Tax. Necessary documents for availing such benefits will be furnished by BHEL to suppliers.~~
- **Imported scope of supply:**
 - a) ~~Project is Mega Power Project or Ultra Mega Power Project: Eligible for "NIL" Customs Duty.~~
 - b) ~~Physical Export project: Eligible for complete exemption of Customs Duty.~~
 - c) **E) Merit customs duty applicable**

Terms of Delivery:

Indicate _____ station _____ of _____ despatch: _____
_____ Indicate place
of manufacturing (wherever applicable): _____ □

Indigenous scope of supply: Ex-works (including Packing & Forwarding charges but excluding Taxes & Duties):

- **Imported scope of supply:** F.C.A. (for air consignments) /F.O.B. (for sea consignments)

(including Packing, Forwarding, Handling, Ancillary charges like processing of Sight Draft/ Letter of Credit, negotiation of bank documents, Export declaration, Country of Origin etc):

S NO.	TERMS	BHEL ACCEPTABLE TERM	BIDDER'S CONFIRMATION	DEVIATION IF ANY
01	Validity	The offer will be valid for a period of date of PQC 120 days from the bid opening (PART I)	AGREE	
02	Excise Duty & Cess	<p>If applicable, indicate current rate of Excise Duty and maximum rate of Excise Duty (against proof of Excise Invoice).</p> <p>However, for calculation purpose and arriving at "Total Cost to BHEL" maximum rate of Excise Duty will be considered. In case Excise Duty remains firm throughout the contract, the same shall be specifically indicated. Otherwise, maximum Excise Duty will be considered for arriving at lowest bidder.</p> <p>However, reimbursement of Excise Duty shall be at actuals against proof of Excise Invoice only. (Within contractual delivery).</p> <p>Physical export contract eligible for complete exemption of Excise duty against submission of necessary documents by BHEL like ARE-1/CT-1 form.</p>	<p>APPLICABLE / NOT APPLICABLE</p> <p>Present rate of Excise Duty with CESS%</p> <p>Maximum rate of Excise Duty with CESS%</p>	
03	Central Sales Tax (CST)	<p>If applicable, indicate current rate of sales tax against form "C".</p> <p>For issue of original form "C", vendor has to furnish "E1/E2" form. To enable vendor give E1/E2 form, photocopy of C form will be issued by BHEL.</p> <p>Please confirm submission of "E1/E2 Sale form".</p> <p>For physical export project, Sales Tax is exempted against necessary documents furnished by BHEL.</p>	<p>APPLICABLE / NOT APPLICABLE</p> <p>Present Sales Tax rate against form "C" %</p> <p>CONFIRMED</p>	
04	Value Added Tax (VAT)	<p>If applicable, indicate current rate of VAT.</p> <p>When VAT is applicable, BHEL ROD's/ Nodal Agency's Name, TIN No. and address to be indicated in invoice. (Note that two original invoice and one tax invoice should be submitted to BHEL).</p>	<p>APPLICABLE / NOT APPLICABLE</p> <p>VAT rate at present %</p> <p>NOTED</p>	
05	Octroi	If applicable, indicate current rate of octroi.	<p>AGREE</p> <p>Present Octroi rate%</p>	
06	Freight Charges (for indigenous scope of supply)	<p>Freight charges shall be to vendor's account.</p> <p>Quote lumpsum reasonable Freight charges separately in priced offer, plus service tax if any.</p> <p>Vendor's offer will be evaluated on "Total cost basis" including freight charges.</p> <p>Vendor shall book the consignment through their approved Road carriers on "Freight pre-paid" and door delivery consignee copy attached basis. Freight charges to be claimed from BHEL along with POD (Proof of Delivery) on original L/R.</p>	<p>AGREED and quoted as lumpsum amount in price bid.</p> <p>Service Tax _____% (extra /inclusive in freight charges)</p>	
07	Service Tax on E&C and Training Charges	<p>If applicable, indicate current rate of Service Tax _____%</p> <p>Service Tax Regn. No. _____</p> <p>Confirmation that Service Tax register is maintained.</p>	<p>APPLICABLE / NOT APPLICABLE</p> <p>CONFIRMED</p>	

08	Parting of license for imported raw materials	In case of Mega project, Ultra-Mega project and Physical Export project where Custom Duty and Excise Duty are	AGREE	
		<p>NIL and vendor is importing any raw materials / components for the enquired item, same are eligible for Zero Customs duty. As per EXIM policy, BHEL will part the import licence with the vendors to obtain import licence by themselves and custom clear the raw materials/ components by availing zero customs duty. Hence, please furnish list of raw materials / components to be imported by you with Quantity and CIF value (for which BHEL has to share import licence). The benefit due to the above shall be passed on to BHEL and confirmed in the quotation.</p> <p>If there are no imported raw materials/components, same shall be confirmed in the offer.</p>	<p>CIF value</p> <p>Yes, benefit passed-on to BHEL in the priced quotation.</p> <p>We confirm that there are no imported components.</p>	
09	Delivery Period	Within 08 weeks from the date of issue of approved documents or manufacturing clearance by BHEL, whichever is later.		
10	Guarantee/ Warranty	36 months from the date of dispatch or 30 months from the date of commissioning of this supplied equipment whichever is earlier.		
11	Inspection agency	<p>Materials will be inspected by :</p> <ul style="list-style-type: none"> • BHEL • Customer/Consultant/BHEL nominated Third Party Inspection Agency (TPIA) 	AGREE	
12	Terms of Payment at the time of material supply	<p>Refer Clause “F” of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms:</p> <p>Indigenous Scope: a))Supply with E&C</p> <p>b) Supply with supervision of E&C</p> <p>c) Supply only</p> <p>Imported Scope:</p> <p>a))Supply with E&C</p> <p>b) Supply with supervision of E&C</p> <p>€) Supply only</p> <p>Note: Kindly indicate if High Sea Sales will be operated. If yes, confirm submission of relevant documents as per Annexure V.</p>	<p>AGREE</p> <p>YES / NO</p> <p>CONFIRMED</p>	
13	Performance Bank Guarantee (PBG)	<p>PBG will be applicable for a period of 36 months + claim period of 6 months for a value equal to 10% of the basic value of the purchase order.</p> <p>Refer Clause “G” of Instructions to Bidders.</p>	AGREE	
14	Terms of Payment not related to material supply	<p>For Training:</p> <p>100% will be paid in 45 days from the date of completion of Training or 15 days from the date of submission of complete set of documentation, whichever is later. Separate invoice shall be submitted for Training charges along with documentary evidence. For Engineering & Documentation Charges:</p> <p>100% will be paid in 45 days from the date of approval of final documents or 15 days from the date of submission of invoice, whichever is later. Separate invoice to be submitted for Engineering & documentation charges.</p>	AGREE	

15	Mode of despatch	<p>Indigenous Scope: By Road on Door Delivery Consignee Copy attached basis through your approved transporter (unless otherwise indicated in Despatch Instructions), only on receipt of Despatch Clearance from BHEL.</p> <p>Imported Scope: By Air/Sea through BHEL approved Consolidator/Freight Forwarder, only on receipt of Despatch Clearance from BHEL.</p>	AGREE	
16	Despatch Documents	<p>Complete set of despatch documents (original + 1 photocopy set) as per Purchase Order shall be forwarded to BHEL directly.</p> <p>Depending upon the project/customer demands, despatch documents may include one or more documents from the following: Commercial Invoice, Excise Invoice (if ED is applicable), Lorry Receipt (L/R), Packing List, Air Way Bill (AWB), Country of origin certificate, Warranty Certificate, Insurance Intimation letter, NIL Short Shipment Certificate, Original Performance Bank Guarantee (directly from issuing bank to BHEL), POD (Proof of Delivery) on original L/R, Disclaimer Certificate (as per BHEL format attached as Annexure XI) along with ER-1 form & attested excise invoice (as per project demands like Nuclear Power plant) etc.</p> <p>The precise list of despatch documents needed for a particular project will be specified in the Purchase Order.</p> <p>One set of Invoice, Packing List and L/R or AWB shall be e-mailed/faxed immediately to BHEL-EDN after despatch.</p>	AGREE	
17	O & M Manuals	<p>As built Drawings, O & M Manuals and other approved documents shall be furnished in required no. of sets as per Specification/Purchase Order.</p> <p>Note: Supply of above documents (O&M) in required no. of sets along with material shall be indicated in packing list. If not mentioned BHEL may insist for submission in required sets once again.</p>	AGREE	
18	Quantity Tolerance	<p>If applicable, indicate Quantity tolerance for each of the line item.</p> <p>For Impulse/seamless/ GI pipes one random length applicable for each variety of pipes.</p>	CONFIRMED	Quantity Tolerance % Per Variety
19	Evaluation criteria for tendered item	<p>Itemwise evaluation of tendered item.</p> <p>Splitting of tendered quantity to MSE vendors (if any) is applicable.</p> <p>OR</p> <p>Items will not be split on Itemwise lowest offer. Items to be evaluated and procured as a package.</p>	AGREE	
20	Integrity Commitment	<p>Integrity commitment will be applicable in the tender process and execution of contracts as mentioned in clause "1" of Instructions to Bidders.</p> <p>IEM NAME: SRI V V R SASTRY , EX-CMD, BEL.</p>	AGREE	

THE ENCLOSED INTGRETY PACT AGREEMENT FORMAT TO BE FILLED, SIGNED AND SUBMITTED ALONG WITH PART 1 PQC BID

With this, it is inferred that vendor has understood and accepts all terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 00) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 00).

VENDOR'S SIGNATURE WITH SEAL

NOTE: The above filled-in and signed-sealed document (in original) shall be furnished as part of Part-I Bid without fail. If no deviations are brought, it will be treated as if all terms and conditions of this enquiry are accepted by vendor without any deviation.



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भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 001- Rev 00

INSTRUCTIONS TO BIDDERS (Common for all RFQs)

Bidder is requested to read the instructions carefully and submit their quotation covering all the points:

A. GENERAL INSTRUCTIONS:

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: CE: PR: 001 – Rev 00), General Conditions of Contract (document reference: CE: PR: 002 - Rev 00) and Special Conditions of Contract, if any, of the enquiry.
2. Any deviations from or additions to the “General Conditions of Contract” or “Special Conditions of Contract” require BHEL’s express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Bidders (also includes the term suppliers / contractors wherever used in this document) are instructed to quote their most competitive price and best delivery, etc. in the offer. Prices should be indicated in both figures & words. **(Please also refer clause 11 under section B)**
4. Regret letter (either through post or by mail) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender. If a bidder fails to respond against 3 consecutive tenders for the same item, he will be liable for removal as a registered vendor of BHEL.
5. Procurement directly from the manufacturers shall be preferred. However, if the OEM / Principal insist on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and his agent, bid received from the agent shall be ignored.
6. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
7. If an Indian representative / associate / liaison office quotes on behalf of a foreign based bidder, such representative shall furnish compulsorily the following documents:
 - a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
 - b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
 - c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages / damages / replacement / repair of imported scope till system is commissioned and handed over to customer will be the sole responsibility of the Indian representative / associates / agent / liaison office.
 - d. Refer **Annexure X** on “Guidelines for Indian Agents”.
8. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport / Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment. Warehousing charges due to

incomplete or missing documentation will be recovered from the supplier's bill. All offers for imported scope of supply must be made from any of the gateway ports (within the country) indicated. **(Refer Annexure I)**

9. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: **www.bhel.com**
10. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices / misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike / lockout for a long period.

B. GUIDELINES FOR PREPARATION OF OFFER:

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
 - **SINGLE PART BID:** Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
 - **TWO PART BID:** Unpriced offer i.e. "Techno-commercial Bid" with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the "Price Bid" without the prices** should be enclosed in one cover and the cover must be super scribed "**Techno-commercial offer**) and Priced offer i.e. "Price Bid" containing price summary in a separate sealed envelope and must be super scribed "**Price Bid**". Both these envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number due date of tender and any other details as called for in the tender document.
 - **THREE PART BID:** Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number due date of tender and any other details as called for in the tender document.

If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission or if any part of the offer is incomplete the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to super scribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is "Techno Commercial Bid" or "Price Bid" or "Pre-Qualification Bid". Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.
3. BHEL standard Commercial Terms and Conditions (duly filled, signed & stamped) must accompany Technical-Commercial offer without fail and should be submitted in original only. Xerox copy will not be accepted.
4. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without deviation.
5. Deviation to this specification / item description, if any, shall be brought out clearly indicating "DEVIATION TO BHEL SPECIFICATION" without fail, as a part of Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.
6. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and / or any other relevant documents called in purchase specification as part of Technical Bid.
7. "Price Bid" shall be complete in all respects containing price break-up of all components along with all

applicable taxes and duties, packing & forwarding charges (if applicable), freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the "Price Bid." Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.

8. In addition, bidder shall also quote for erection & commissioning charges (E&C charges), documentation charges, service charges, testing Charges (type & routine), training charges, service tax, etc. wherever applicable. The price summary must indicate all the elements clearly.
9. Vendors should indicate "lump sum" charges (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for Supervision of Erection, Commissioning and handing over to customer. The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist and service tax (if any).
10. Wherever bidders require PAC (Project Authority Certificate) for import of raw materials, components required for Mega Power Projects, Export Projects or other similar projects wherein supplies are eligible for customs duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.
11. All quotations shall be free from corrections /overwriting. Corrections if any should be authenticated with signature and seal. Any typographical error, totaling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure II** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid". BHEL decision will be final.

C. GUIDELINES FOR OFFER SUBMISSION:

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in our reception area with caption "CE, SC&PV, DEFENCE." Tenders are opened on 3 days in a week (Monday/Wednesday/Friday). Tender must be deposited in the slot corresponding to the day (Monday - Box no.4/Wednesday - Box no. 6 /Friday - Box no.8) while depositing the offer. **(This clause will not be applicable for e-tenders)**
2. E-Mail / Internet / EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email ID specified in the SCC of the tender. (Refer to SCC document of tender)
3. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over either of the two officers whose names are mentioned in the RFQ. (Refer to SCC document of tender)
4. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. In case of e-procurement, bidders can see tender results till seven days after due date and time.
5. Vendor will be solely responsible:
 - a. For submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
 - b. For submission of offers in the correct compartment of the tender box based on the day of due date (Monday/Wednesday/Friday). Please check before dropping your offer in the correct tender box.
 - c. For depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong tender box or if the tender document is handed over to the wrong person BHEL will not be responsible for any such delays.
 - d. For offers received through email etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time.
 - e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, etc. will be the sole responsibility of the vendor. Wherever assistance is

needed for submission of e-tenders, help line numbers and executives of service provider of BHEL may be contacted.

Service provider: M-junction

Website address: <https://bheleps.buyjunction.in/>

Helpline no.: 033-66106426/6217/6013/6046/6176 (9:30 am to 5:30 pm)

9163348283/9163348284/9163348285/9163348286/8584008116 (5:30 pm to 8:30 pm)

Purchase Executive / BHEL will not be responsible for any of the activities relating to submission of offer.

D. PROCESSING OFFERS RECEIVED:

1. Any discount / revised offer submitted by the supplier on its own shall be accepted provided it is received on or before the due date and time of offer submission (i.e. Part-I bid). The discount shall be applied on pro-rata basis to all items unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes / revisions are requested by BHEL.
3. In case there is no change in the technical scope and / or specifications and / or commercial terms & conditions, the supplier will not be allowed to change any of their bids after Technical bids are opened (after the due date and time of tender opening).
4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL and it accounts for price implications from vendors, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid. Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening.
5. BHEL EDN reserves the right to adopt Reverse Auction or standard Price Bid Opening procedure for price evaluation, at its discretion. This will be decided after completion of technical evaluation of tender. **(Refer Annexure III for Guidelines for Reverse Auction).**
6. Un-opened bids (including price bids) will be returned to the respective bidders after release of PO and receipt of order acknowledgement from the successful bidder.
7. After receipt of Purchase Order, supplier should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and / or any other relevant documents as per Specification / Purchase Order, as and when required by BHEL / Customer.
8. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL EDN and agreed upon in the Purchase Order.
9. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL").
 "Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and duties, freight charges, insurance, service tax for services, any other cost indicated by vendor for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions). Benefits arising out of Nil Import Duty on Mega Projects, Physical Imports or such 100% exemptions (statutory benefits), customer reimbursements of statutory duties (like Excise Duty, CST, VAT) will also be taken into account at the time of tender evaluation. (wherever applicable and as indicated in SCC document of tender)

10. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids: Date of tender opening
Two/three part bids: Date of Part-I bid opening
Reverse Auction: Date of Part-I bid opening

In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.

11. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers.

E. INFORMATION ON PAYMENT TERMS:

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format **(Refer Annexure IV)** for receiving all payments through NEFT. (Applicable for Indian vendors only)
2. In case of High Sea Sales transaction, customs clearance of the consignment landed on Indian Sea / Air ports will be done by BHEL based on the original HSS documents provided by vendors. All warehousing charges due to delay in submission of complete and or correct HSS documents to BHEL will be to suppliers account only. Such recovery will be made out of any of the available bills. **(Refer Annexure V)**.
3. Statutory deductions, if any, will be made and the deduction certificate shall be issued. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act. (Applicable for Indian vendors only).
Foreign vendors shall submit relevant details of their bankers like Swift Code, Banker's Name & Address etc.
4. Vendors must submit bills & invoices along with required supporting documents in time. Incomplete documentation / delayed submission of invoice / documents will result in corresponding delay in payment.

F. STANDARD PAYMENT TERMS OF BHEL-EDN

Purchase Orders for indigenous procurement

(a) SUPPLY WITH E&C:

- 1) 85% of basic value (excluding E&C charges) + 100% of taxes, duties and freight charges will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation whichever is later.
- 2) 15% of basic value (retention money), (excluding E&C charges) will be paid in 15 days from the date of submission of documents against supplementary invoice with proof of completion of E&C along with E & C charges (if any)

(b) SUPPLY WITH SUPERVISION OF E&C:

- 1) 90% basic value (excluding E&C charges) + 100% of taxes, duties and freight charges will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation whichever is later.
- 2) 10% of basic value (retention money), (excluding E&C charges) will be paid in 15 days from the date of completion of erection and commissioning against supplementary invoice with proof of completion of E&C along with supervision charges (if any)

(c) SUPPLY ONLY:

- 1) 100% of PO value with taxes, duties and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation whichever is later.

Purchase orders for import procurement:

(d) SUPPLY WITH E&C:

- 1) 85% of the basic value (excluding E&C charges) will be paid in 45 days, against usance draft of 45 days, from the date of AWB/BOL on submission of complete set of documents.
- 2) 15% of basic value (retention money), (excluding E&C charges) will be paid in 15 days from the date of completion of E&C along with E & C charges against supplementary invoice with proof of completion of E&C (if any).

(e) SUPPLY WITH SUPERVISION OF E&C:

- 1) 90% of the value of the order will be paid on the 45th day, against usance draft of 45 days, from the date of AWB/BOL on submission of complete set of documents.
- 2) 10% of basic value (retention money) will be paid in 15 days from the date of completion of erection and commissioning against supplementary invoice with proof of completion of E&C along with supervision charges (if any).

(f) SUPPLY ONLY:

- 1) 100% of PO value will be paid against usance draft of 45 days from the date of dispatch or 15 days from the date of submission of complete set of documents whichever is later.

LOADING FACTORS FOR PAYMENT TERMS:

- 1) For offers received with requests for negotiation of documents through bank loading will be 15% of basic value (all bank charges to be borne by the seller).
(This loading factor is applicable only for purchase orders for indigenous supply).
- 2) In all cases where credit period is 30 days but not in line with the above mentioned standard payment terms offered loading applicable will be 5% of basic value.
(This loading factor is applicable only for purchase orders for indigenous supply).
- 3) For offers received with Letter of Credit payment term in place of sight draft payment term, loading applicable will be 5% of basic value. Additional loading of 5% will be applicable for payment terms as Letter of Credit with usance of less than 45 days.
(This loading factor is applicable only for purchase orders for imported supply).
- 4) For offers received with Sight Draft payment terms with usance of less than 45 days, loading of 5% will be applicable.
(This loading factor is applicable only for purchase orders for imported supply).
- 5) All payment terms with credit period of less than 30 days for indigenous supply and any other variation of payment terms are liable for rejection.
- 6) Standard payment terms indicated in para F (a), (b), (c), (d), (e) and (f) will not attract any loading.

Note 1: Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight and E&C charges (wherever applicable).

Wherever the Purchase Order is split into import portion and indigenous portion of supply the retention money will be 15% or 10% (as applicable) of both purchase order values put together.

Note 2: *If the E&C could not be completed till the end of the Warranty period due to reasons not attributable to the supplier, BHEL may consider releasing the retention money to the supplier against Bank Guarantee for equivalent value valid for an initial period of one year.*

G. Bank guarantee (BG) / Performance bank guarantee (PBG):

1. Bank guarantee (BG) / Performance bank guarantee (PBG) will be applicable as called in the tender documents. Such PBG shall be valid for a period of 36 months + claim period of 6 months for a value equal to 10 % of the basic value of the purchase order. No deviation for the duration of PBG / BG will be permitted.
 - a. PBG shall be from any of the BHEL consortium of bankers (**refer Annexure VI**).
 - b. PBGs from nationalized banks are also acceptable.
 - c. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order. PBG should be in the format indicated. (**Refer annexures VII & VIII respectively**). No deviation to these formats will be allowed.
 - d. Confirmation from any of the BHEL consortium of banks or any of the Indian Public Sector Banks is essential for the acceptance of PBGs issued by foreign banks (located outside India).
 - e. Expired BGs / PBGs will be returned only after expiry of the claim period or on completion of the contractual obligation.
 - f. **Non acceptance for submission of PBG will attract loading as indicated below**
 - i. Loading will be equal to the percentage of value for which BG / PBG is not provided. (Ex: if PBG / BG is given for 3 % of the basic value against 10% specified, loading applicable will be 7% (10 – 3 = 7 %). This value will be added to the quoted price while evaluating the lowest offer.

H. PROVISIONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES)

Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration. Vendors have to submit any of the following documents along with the tender documents in the Part I / Technical bid cover to avail the applicable benefits.

- a. Valid NSIC certificate or
- b. Entrepreneur's Memorandum part II (EM II) certificate (deemed valid for 2 years).
- c. EM II certificate with CA certificate (**in the prescribed format given in Annexure IX**) applicable for the year certifying that the investment in plant and machinery of the vendor is within permissible limits as per the MSME Act 2006 for relevant status where the deemed validity is over.
- d. Documents submitted for establishing the credentials of MSE vendors must be valid as on the date of part I / technical bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Documents submitted after the Part I / Technical bid opening date will not be considered for this tender.

PURCHASE PREFERENCE FOR MSE VENDORS:

- e. MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 20% of the requirement against this tender provided
 1. The MSE vendor matches the L1 price
 2. L1 price is from a non MSE vendor
 3. L1 price will be offered to the nearest vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2) next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
 4. 20% of the 20% (i.e. 4% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) and (2) are fulfilled.

5. In case no vendor under SC / ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, in such cases the 4% quantity will be distributed among the other eligible MSE vendors who have participated in the tender.
6. Serial no. 1 to 5 will not be applicable wherever it is not possible to split the tendered quantity / items on account of customer contract requirement, or the items tendered are systems. Such information that tendered quantity will not be split will be indicated in the SCC.

I. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:

1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.

2. Commitment by Bidder(s)/ Contractor(s):

- a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
- b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
- c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. The Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain or pass on to others, any information or document provided by BHEL as part of business relationship.
- d. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

PURCHASE EXECUTIVE

ANNEXURE - I
LIST OF INTERNATIONAL GATEWAY AIRPORTS

For airbased consignment, terms of delivery will be on FCA basis from following listed airports only.
This list is valid from 01.03.2013 to 28.02.2015. Vendors are requested to verify this list for use after 28.02.2015.

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

ANNEXURE – II
DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

(a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

ANNEXURE-III
GUIDELINES FOR REVERSE AUCTION PROCEDURE

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit "online sealed bid" in the Reverse Auction. Non-submission of "online sealed bid" by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to fax the Compliance form before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.
12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the "Business Rules of Reverse Auction", which will be communicated before the Reverse Auction.
13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.
14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

ANNEXURE - IV
Electronic Funds Transfer (EFT) OR
Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): _____ CREATE _____ CHANGE

BHEL Vendor / Supplier Code:	
Company Name :	
Permanent Account Number(PAN):	
Address	

City:	PINCODE	STATE
-------	---------	-------

Contact Person(s)	
Telephone No:	
Fax No:	
e-mail id:	

1 Bank Name:	
2 Bank Address:	
3 Bank Telephone No:	
4 Bank Account No:	
5 Account Type: Savings/Cash Credit	
6 9 Digit Code Number of Bank and branch appearing on MICR cheque issued by Bank	
7 Bank IFSC Code(applicable for NEFT)	
8 Bank IFSC code(applicable for RTGS)	(Indian Financial System Code)

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation:

Telephone No. with STD Code

Company Seal

Bank Certificate

We certify that _____ has an Account No _____ with us and we confirm that the bank details given above are correct as per our records.

Date: _____ (.....)

Place: _____ Signature

Please return completed form **along with a blank cancelled cheque or photocopy** thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call concerned purchase executive.

ANNEXURE - V
PRESENT PROCEDURE FOR SALE IN TRANSIT (HIGH SEA SALES)

In case of High Sea Sales, vendor should submit following documents:

1. ORIGINAL HIGH SEA SALES AGREEMENT

- Sale agreement (on Rs. 200/- non-judicial stamp paper & notarised with 2 witnesses with identity) has to be signed between BHEL and the Party importing material. The date of the sale documents should be in between the date of House Air Way Bill / Bill of Lading and before landing of the goods in Indian origin.
- The date of the stamp paper should be prior to the Air Way Bill / Bill of Lading date.
- Following shall be included in the High Sea Sales Agreement:
“THE BUYER ALSO UNDERTAKE DISCHARGES, THE OBLIGATION AND FULFILLMENT OF CONDITIONS, IF ANY, ATTACHED TO THE IMPORTATION, ASSESSMENT AND CLEARANCE OF THE GOODS IN TERMS CUSTOMS TARIFF ACT 1975, THE CUSTOMS ACT 1962 & RULES & REGULATIONS MADE THERE UNDER AND OTHER RELEVANT ACTS, ORDERS, NOTIFICATIONS”.

2. ORIGINAL INVOICES: INDIGENOUS RUPEE INVOICE & FOREIGN CURRENCY INVOICE

- Prices should be C.I.F., designated airport/seaport basis.
- I.E.C., C.S.T., K.S.T. Nos. to be mentioned.
- Description of item (Nomenclature), Unit & Quantity in both the Foreign Currency & the Indigenous Invoice in Rupee shall be exactly as per Purchase Order Description of item, Quantity and Unit. The Indigenous Invoice value shall be exactly as per Purchase Order value.
- Seller should give Foreign Currency Invoice from the original consignor. The Foreign Currency Invoice value should be at least 2% (two per cent) less than the Indigenous Rupee Invoice value in equivalent foreign currency.

4. ORIGINAL HOUSE AIR WAY BILL/ BILL OF LADING

- The sale agents should duly endorse House Air Way Bill (HAWB) for air shipments or original Bill of Lading (O.B.L.) for sea shipments and Foreign Currency Invoice in favour of BHEL-EDN.

5. ORIGINAL CARGO ARRIVAL NOTICE FROM FORWARDER.

6. ORIGINAL DELIVERY ORDER ISSUED IN NAME OF BHEL-EDN.

7. ORIGINAL PACKING LIST.

8. A LETTER TO THE COMMISSIONER OF CUSTOMS FOR EFFECTING ABOVE SALE.

9. A LETTER TO THE DEPUTY ASSESSOR (OCTROI) FOR EFFECTING ABOVE SALE IN FAVOUR OF BHEL.

REMARKS: In case vendor needs any clarifications on the above, the same may be sought in writing.

Annexure-VI
BHEL MEMBER BANKS (LIST OF CONSORTIUM BANKS)

BANK GUARANTEE (BG) SHALL BE ISSUED FROM THE FOLLOWING BANKS ONLY:

	Nationalised Banks		Nationalised Banks
1	Allahabad Bank	19	Vijaya Bank
2	Andhra Bank		Public Sector Banks
3	Bank of Baroda	20	IDBI
4	Canara Bank		Foreign Banks
5	Corporation Bank	21	CITI Bank N.A
6	Central Bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Ltd. (HSBC)
8	Indian Overseas Bank	24	Standard Chartered Bank
9	Oriental Bank of Commerce	25	The Royal Bank of Scotland N.V.
10	Punjab National Bank	26	J P Morgan
11	Punjab & Sindh Bank		Private Banks
12	State Bank of India	27	Axis Bank
13	State Bank of Hyderabad	28	The Federal Bank Limited
14	Syndicate Bank	29	HDFC Bank
15	State Bank of Travancore	30	Kotak Mahindra Bank Ltd
16	UCO Bank	31	ICICI Bank
17	Union Bank of India	32	IndusInd Bank
18	United Bank of India	33	Yes Bank

Note:

- All BGs must be issued from BHEL consortium banks listed above.
- BHEL may accept BG from other Nationalised Banks also which are not listed above.
- BG will not be accepted from Scheduled Banks and Co-operative Banks.
- In case BG is issued from a bank located outside Indian territory and is issued in foreign currency, the BG must be routed through and confirmed by any one of the above mentioned consortium banks or any of the Indian Public Sector Banks.
- This list is subject to changes. Hence vendors are requested to check this list every time before issuing BGs.

ANNEXURE-VII

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited ¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at _____ ² hereinafter referred to as the 'Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Contractor having agreed to provide a Contract Performance Guarantee, equivalent to% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs ----- (Rupees -----) without any demur, immediately on a demand from the Employer, .

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We thebank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including.....⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the⁷we shall be discharged from all liabilities under this guarantee thereafter.

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed.....⁸
- b) This Guarantee shall be valid up to⁹

c) Unless the Bank is served a written claim or demand on or before _____¹⁰ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

⁸ BG AMOUNT IN FIGURES AND WORDS.

⁹ VALIDITY DATE

¹⁰ DATE OF EXPIRY OF CLAIM PERIOD

ANNEXURE-VIII

Note for performance bank guarantee:

1. To be executed in Rs. 100/- Non-Judicial stamp paper.
2. To be submitted by issuing bank to Purchase Dept. directly. Please give BHEL address to banker.
3. Do not enclose with Bank document.
4. Modifications and additions/deletions to this BG format shall not be permitted.
5. **In Case of Bank Guarantees submitted by Foreign Vendors-**
 - a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
 - b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.
 - b.4 The BG should clearly specify that the demand or other document can be presented in electronic form.

Annexure - IX
Certificate by Chartered Accountant on Letter Head

This is to certify that M/s
.....(Hereinafter referred to as 'Company')
having its registered office at is registered under MSMED Act 2006,
(Entrepreneur Memorandum No (Part-II dtd
Category: (Micro/Small). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as
on date..... **as per MSMED Act 2006 is as follows:**

- 1. For Manufacturing Enterprises:** Investment in plant and machinery (i.e., original cost excluding land and building and the items specified by the Ministry of Small Industries vide its notification No.S.O.1722 (E) dated October 5, 2006:
- 2. For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs.Lacs.

The above investment of Rs. Lacs in within permissible limit of
Rs..... Lacs for.....Micro / Small (Strike off which is not
applicable) Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership Number -

Seal of Chartered Accountant

Guidelines for Indian Agents
ANNEXURE - X

- **Definition of Indian Agent:** An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

In case of yes, vendor to note the following and reply accordingly:

- i. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- iii. The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- vi. In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- vii. The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure - 'A' shall apply in all such cases.

- viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL as per the extant guidelines of Supplier Evaluation, Approval & Review Procedure (SEARP), before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed). It will be the responsibility of the OEM/ foreign principal to get acquainted with the evaluation requirements of Indian supplier/ agent as per SEARP available on www.bhel.com.

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

---X---

Vendor's Signature with Seal

Guidelines for Indian Agents of Foreign Suppliers

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 **Disclosure of particulars of agents/ representatives in India, if any.**
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:
 - 2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent/ representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
 - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
 - 2.1.3 Confirmation of the Tenderer that the commission/ remuneration, if any, payable to his agents/ representatives in India, may be paid by BHEL in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
 - 2.2.1 The Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.
 - 2.2.2 The amount of commission/ remuneration included in the price (s) quoted by the Tenderer for himself.
 - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/ representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

Disclaimer Certificate For Deemed Export Benefits

I, (Name & Designation)on behalf of M/s. (Name and address of the supplier) hereby certify that we have supplied the following goods to M/s..... (Name and address of the recipient):

S.No.	Inv. No. & date	Description of goods	Unit	Qty.	Value

1. We are the manufacturer exporters/suppliers and are registered/not registered with Central Excise and have not availed and will not avail CENVAT facility in respect of the input/components used in aforesaid supplies. We have also not availed and will not avail rebate on the inputs/components used in aforesaid supplies.

OR

We are the suppliers and our supporting manufacturer(s) is/are registered/not registered with Central Excise and have not availed and will not avail CENVAT facility in respect of the inputs/components used in aforesaid supplies.

2. We also certify that we have not been issued any Advance Authorization/Duty Free Import Authorization in respect of the aforesaid supplied goods and have not availed any benefit thereon.

3. We further state that we have not drawn nor will draw any benefit for deemed export and we have no objection if M/s..... (Name and address of the recipient) draws the deemed export benefits on the supplies mentioned above. (Required to be given in case benefits are claimed by recipient of goods).

OR

We have not given disclaimer certificate to M/s..... (Name and address of the recipient) and will not give disclaimer certificate, in future, in respect of these supplies for claiming deemed export benefits (Required to be given in case benefits are claimed by DTA suppliers).



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 002- Rev 00

GENERAL COMMERCIAL CONDITIONS FOR CONTRACT

These 'General Commercial Conditions for Contract for Purchase' hereinafter referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects / customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- a) 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bangalore 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- b) 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
- c) 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent / acceptance / award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection / Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
- d) 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.

Interpretation:

In the contract, except where the context requires otherwise:

- a) words indicating one gender include all genders;
- b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

Applicable Conditions:

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted unless otherwise such variations / escalations are provided for and agreed by BHEL in writing in the purchase order.
2. **Validity:** The offer will be valid for a period of 120 days from the date of technical bid opening date. Validity beyond 120 days, if required, will be specified in the SCC (special conditions of contract).
3. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head within two weeks from the date of Purchase Order or such other period as specified / agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.
The purchase order will be deemed to have been accepted if no communication to the contrary is received within two weeks (or the time limit as specified / agreed by BHEL) from the date of the purchase order.
4. **Documentation:** After receipt of Purchase Order, vendor should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents /specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.
5. **Penalty:**
For delay in documentation: In the event of delay in submission of complete set of documents ((like drawings, bill of materials, datasheets, catalogues, quality plan etc. as called in tender specifications including soft copies wherever applicable) in required sets beyond three weeks (or as agreed/indicated in the Purchase Order) from the date of Purchase Order, penalty at 0.5% (half percent) per week or part thereof, limited to a maximum of 5% (five percent) of the basic material value of the Purchase Order will be applicable.

For delay in delivery: In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of undelivered portion (basic material cost) will be applicable. Delivery will commence from the date of document approval by customer / BHEL or date of issue of manufacturing clearance, whichever is later. The date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection.

Penalty for delayed documentation/delayed delivery, if applicable, shall be deducted at the time of first payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted.
6. **Contract variations (Increase or decrease in the scope of supply):** BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be applied to such additional work. Vendor shall not

perform additional work before BHEL has issued written instructions / amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.

7. Reverse Auction: BHEL reserves the right to follow REVERSE AUCTION PROCEDURE (ONLINE BIDDING ON NETWORK) before finalising the Purchase order on technically competent bidders, as per the guidelines given in Annexure III. In case BHEL does not resort to Reverse Auction, the price bids and price impacts (if any) already submitted and available with BHEL shall be opened as per BHEL's standard practice.
8. Inspection: Prior written notice of at least 10 days shall be given along with internal test certificates / COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL-EDN, Bangalore for verification / acceptance for issue of dispatch clearance.
All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.
9. Transit Insurance: Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency (as mentioned in dispatch instructions issued by BHEL) through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.
10. High Sea Sales (HSS): Customs clearance of the consignment landed on Indian Sea / Air ports will be done by BHEL based on the original HSS documents provided by vendors.
Any delay in submission of complete / correct HSS documents to BHEL may incur demurrage charges. All demurrage charges on account of incomplete / incorrect HSS documents submission by vendor will be to vendor's account and all such charges will be recovered from any of the available vendor bills with BHEL.
11. Packaging and dispatch: The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea / Air / Rail / Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures / hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.
The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw / solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitary / Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment.
Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (L x B x H) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated.
Separate packing & identification of items should be as follows.
 1. Main Scope - All items must be tagged with part no. & item description.
 2. Commissioning spares - All items must be tagged with part no. & item description.
 3. Mandatory spares - All items must be tagged with part no. & item description.

12. Assignment of Rights & Obligations; Subcontracting: Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.
13. Progress report: Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.
14. Non-disclosure and Information Obligations: Vendor shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.
15. Cancellation / Termination of contract: BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.
BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so, on account of any decline, diminution, curtailment or stoppage of the business.
16. Risk Purchase Clause: In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services NOT supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.
In case of items demanding services at site like erection and commissioning, vendor should send his servicemen /representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase / service including additional handling charges due to the change.
17. Shortages: In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages shall be made good within a reasonable time that BHEL may allow from such intimation and free of cost. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will have to be reimbursed by the Supplier.
Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, Supplier shall make good of all such damages within a reasonable time from such intimation by BHEL. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed.
18. Remedial work: Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.
19. Indemnity Clause: Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment.

20. Product Information, Drawings and Documents: Drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract.

Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.

All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the Contract shall continue to be the property of the disclosing party.

21. Intellectual Property Rights, Licenses: If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods / related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

22. Force Majeure: Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance.

A party affected by an event of force majeure which may include fire, tempest, floods, earthquake, riot, war, damage by aircraft etc., shall give the other party written notice, with full details as soon as possible and in any event not later than seven (7) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

23. Guarantee / Warranty: Wherever required, and so provided in the specifications / Purchaser Order, the Seller shall guarantee that the stores supplied shall comply with the specifications laid down, for materials, workmanship and performance. Unless otherwise specified, guarantee / warranty period shall be 30 months after the date of delivery of goods or 24 months from the date of commissioning of goods whichever is earlier. The guarantee / warranty period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable guarantee / warranty period.

24. Limitation of Liability: Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.

The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.

25. Liability during guarantee / warranty: Vendor shall arrange replacement / repair of all the defective materials / services under its obligation under the guarantee / warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor.
In case, defects attributable to vendor are detected during first time commissioning or use, vendor shall be responsible for replacement / repair of the goods as required by BHEL at vendor's cost. In all such cases expiry of guarantee / warranty will not be applicable.
26. Liability after guarantee / warranty period: At the end of the guarantee / warranty, the Vendor's liability ceases except for latent defects (latent defects are defects / performance issues noticed after the guarantee / warranty has expired). The Contractor's liability for latent defects warranty for the plant and equipment including spares shall be limited to a period of six months from the end of the guarantee / warranty period of the respective plant and equipment including spares or first time commissioning whichever is later but not later than 3 (three) years from the date of shipment.
27. Compliance with Laws: Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.
28. Settlement of Disputes: Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).
29. Arbitration Clause: In case amicable settlement is not reached in the event of any dispute or difference arising out of the execution of the Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision in any manner touching upon the Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred by either party to the sole arbitration of an Arbitrator appointed by the Executive Director/ General Manager of the purchasing unit/ region/ division of BHEL. Vendor shall have no objection even if the Arbitrator so appointed is an employee of BHEL or has ever dealt/ had to deal with any matter relating to this Contract.
Subject as aforesaid the provisions of the Arbitration and Conciliation Act, 1996 of India or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceedings under this clause. It is a term of contract that the party initiating arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute. The venue for the arbitration shall be Bangalore, India. The award of the arbitrator shall be a speaking award and shall be final, conclusive and binding on all parties to this contract.
The cost of arbitration shall be borne equally by the parties. Notwithstanding the existence of any dispute or difference or any reference for the arbitration, the vendor shall proceed with and continue without hindrance the performance of the work under the contract with due diligence and expedition in a professional manner.
30. Applicable Laws and Jurisdiction of Courts: Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in BANGALORE alone shall have jurisdiction to consider over any matters touching upon this contract.

31. General Terms: That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.

That the headings used in this agreement are for convenience of reference only.

That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.

1. Registration of Suppliers and Flow.

Unregistered Supplier: Supplier visits EPS at <https://bheleps.buyjunction.in>

- a. Supplier visits EPS at <https://bheleps.buyjunction.in>
- b. Clicks "REGISTER" for registration
- c. Fills up the Registration Page form
- d. MJ will ensure Authentication of Registration ¹
- e. Supplier logs in with the ID and password
- f. Supplier Maps the signing Certificate
- g. MJ will ensure the authentication the signing certificate ¹.
- h. Supplier Logs in to the system again and views the RFQ
- i. Supplier Attaches himself to the RFQ by clicking the Interested button
- j. Supplier fills the bid template and makes necessary attachments
- k. Supplier submits his bid by clicking CONFIRM.

NB:-

¹ -- BHEL Administrator or user will have no role for approving Registration and Open Tenders and DSC for Any supplier who has registered himself from the front END which is in case of OT.

* *For registered Supplier:*

- Supplier visits EPS home page
- Supplier signs in with his/her user id and password
- Selects the RFQ Code and views it.
- Attaches himself to the RFQ by clicking the Interested button
- Supplier fills the bid template and makes necessary attachments
- Supplier submits his bid by clicking CONFIRM.

2. Open Tender Process For all units with data transfer Mechanism – Template based Bid submission mechanism

▪ BID SUBMISSION

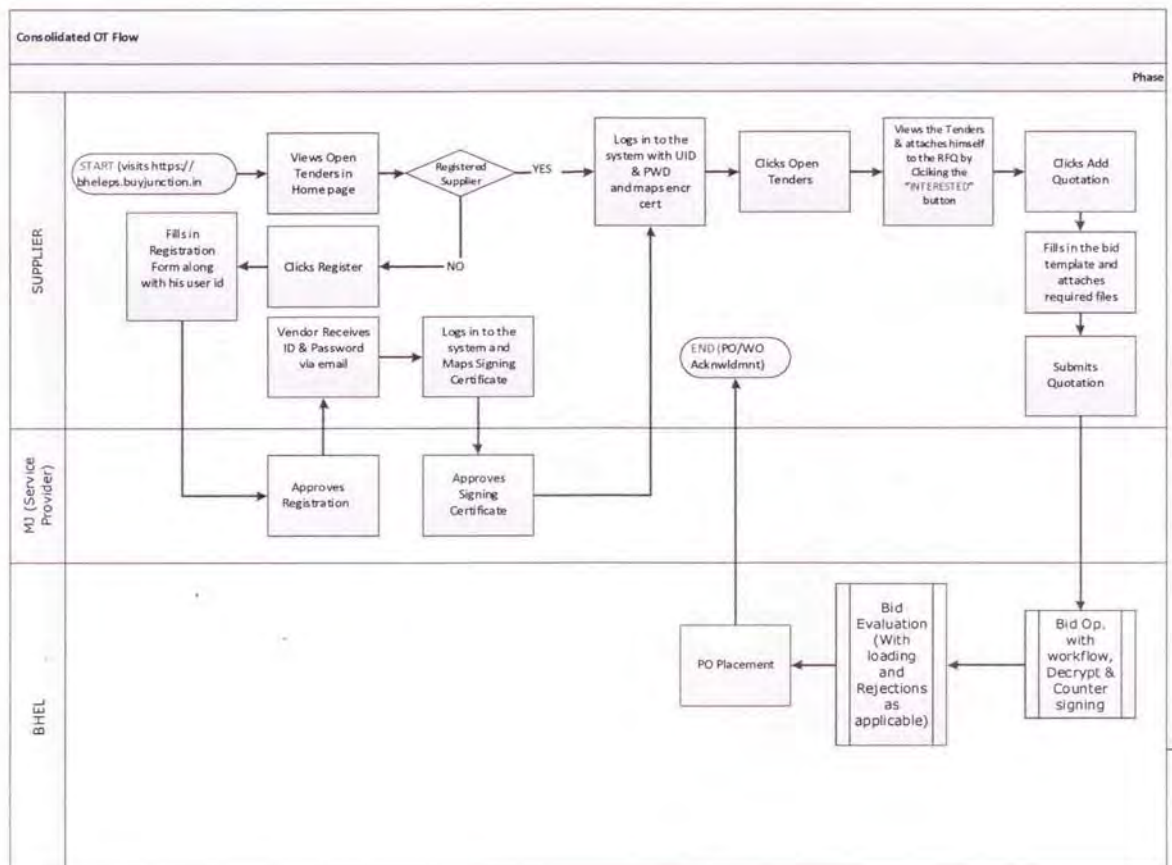
Supplier Login - Select RFQ & view it - Show INTEREST to participate - Respond to RFQ - Add Quotation – Upload proof of TENDER FEE & EMD with the valid document proof (as attachment) – Uploads Pre-qualification docs, Fills Techno-commercial & Price template – Submits Quotation.

NB:

² ADD Intimation is mechanism by which RFQ owner adds Supplier/Contractor i.e known sources' email ids for intimation that an OT has been Issued. This is for information sake only. This does not mean that unintimated supplier cannot participate in OTs. Intimations can be issued by RFQ owner only, both during Tender publication in draft mode and after tender publication till the tender is still live and is viewable by RFQ owner and Approvers only in View Intimation list link in RFQ. This is not to be printed in any report, including chronological report

EPS will only trigger intimation email to all the email ids in the Intimation list.

3. Consolidated Flow Diagram of OT process



INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
 - 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved

in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors". framed by the Principal.

Section 4 – Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

- 6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- 8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the

Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

(Office Seal)

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place-----

Date-----

Witness: _____

(Name & Address) _____

Witness: _____

(Name & Address) _____
