

Bharat Heavy Electricals Limited



Corporate Information Technology

**Request for Proposal
FOR
Video Conferencing Solution**

Table of Contents

1. Introduction.....	4
2. Current Network Scenario.....	4
3. Future Network Planning.....	4
4. Existing VC Setup.....	4
5. Objective.....	4
6. Eligibility Criteria.....	5
7. Key Activities and Dates.....	6
8. General Terms and Conditions.....	7
8.1. Ethical Standard	7
8.2. Integrity Pact	7
8.3. Non-Disclosure Agreement.....	7
8.4. Cost of Bidding	7
8.5. Procedure for Submission and Opening of Bids.....	7
8.6. Marking on Envelope	8
8.7. Bid Submission	8
8.8. Opening of Bids.....	9
8.9. Validity of Offer.....	9
8.10. Deviation	9
8.11. Language of Bid/Correction	10
8.12. Rejection of Bids and Other Conditions.....	10
8.13. Clarifications on Bidding Documents	11
8.14. Amendment of Bidding Documents	11
8.15. Evaluation and Comparison of Bids.....	11
8.16. Taxes	12
8.17. Purchaser's Rights to Accept or Reject Bids.....	12
8.18. Exclusion.....	12
8.19. Statutory Obligations.....	12
8.20. Liabilities From The Contract	12
8.21. Delivery and Installation Schedule.....	13
8.22. Insurance	13
8.23. Indemnity	13
8.24. Risk Purchase	13
8.25. Arbitration	14
8.26. Additional Facility required in Future on Supplied Equipments	14
8.27. Force Majeure	14
8.28. Patent & Trademark	14
8.29. Terminal payment.....	14

9. Special Terms and Conditions	15
9.1. Installation	15
9.2. Performance Guarantee Tests (PG Tests).....	15
9.3. Commissioning Certificates	15
9.4. Project Implementation Schedule	16
9.5. Shifting and Redeployment	16
9.6. Service Level Agreement	16
9.7. Penalty for SLA Non-Conformance	18
9.8. Availability of Spares	19
9.9. Terms of Payment	20
9.10. Income Tax Depreciation	20
9.11. Scope of Work.....	20
9.12. Sub-Contracting.....	21
9.13. Functional Scope for Hardware and Software.....	21
9.14. Training	21
9.15. Warranty and Support	22
9.16. Warranty Coverage.....	23
9.17. MCU Administration.....	23
9.18. Performance Monitoring and Reporting.....	24
9.19. Backup and Restore.....	24
9.20. Supply During Warranty	24
9.21. Offline Support.....	24
9.22. Special Clauses.....	24
10. Technical Requirements.....	26
10.1. Solution Design Requirements	26
10.2. Basic Design Requirements for Multipoint Conferencing Unit at Corporate Office.....	26
10.3. Basic Design Requirements for Recording & Media Streaming System	31
10.4. Basic Design Requirements for VC System for Corporate Office	32
10.5. Basic Design Requirements for VC System for CMD & Directors' Cabins	39
10.6. Basic Design Requirements for VC System for Executive Directors' Cabins	41
10.7. Basic Design Requirements for VC System for Manufacturing Units & PS Regional Head Quarters	43
10.8. Basic Design Requirements for VC System for Project Sites	45
10.9. Basic Design Requirements for Desktop Based Video Conferencing Solution	48
10.10. Design Requirements of Central Management System	49
10.11. Technical Specifications for Racks	54
10.12. Technical Specifications for UPS.....	54
10.13. Technical Specifications for IP Camera and RF System	55
11. List of Annexures	58

1. Introduction:

BHEL is the largest **engineering** and manufacturing enterprise in India in the energy-related/infrastructure sector, today. BHEL was established more than 40 years ago, ushering in the indigenous Heavy Electrical Equipment industry in India - a dream that has been more than realized with a well-recognized track record of performance. The company has been earning profits continuously since 1971-72 and paying dividends since 1976-77.

BHEL manufactures over 180 products under 30 major product groups and caters to core sectors of the Indian Economy viz., Power Generation & Transmission, Industry, Transportation, Telecommunication, Renewable Energy, etc. The wide network of BHEL's 14 manufacturing divisions, four Power Sector regional centers, over 100 project sites, eight service centers and 18 regional offices, enables the Company to promptly serve its customers and provide them with suitable products, Systems and services -- efficiently and at competitive prices. The high level of quality & reliability of its products is due to the emphasis on design, engineering and manufacturing to international standards by acquiring and adapting some of the best technologies from leading companies in the world, together with technologies developed in its own R&D centers.

BHEL's vision is to become a world-class engineering enterprise, committed to enhancing stakeholder value. The company is striving to give shape to its aspirations and fulfill the expectations of the country to become a global player.

2. Current Network Scenario:

The existing WAN is based on MPLS technology connecting about 100 locations, of which 36 are permanent locations, while the rest are project sites. The current MPLS network is from M/s Reliance Infocomm Ltd. Of 100 locations, approximately 34 locations are on Fiber, 6 are on Copper, 36 on RF and 22 are VSAT sites. Currently the bandwidth at VSAT sites is 256Kbps, at other project sites the bandwidth is 1 Mbps, which is going to be enhanced to 2 Mbps in near future. At permanent locations, the bandwidth ranges from 2 Mbps to 12 Mbps. Typical latency at OFC sites is between 20ms to 30ms and at RF sites between 40ms to 60ms.

There are about 20 project sites which are currently connected through Point-to-Point leased lines / MLLN links with their Regional Head Quarter.

3. Future Network Scenario:

BHEL is planning to have two MPLS service providers to cover all its locations. Initially some locations will be on one service provider and some locations will be on second service provider. The two networks will inter-connect at the two hub locations (Noida & Hyderabad). In the long run, at every site there will be two links, one each from the two service providers. One link will be primarily used for ERP traffic and the other link will be primarily used for VC and other traffic. However, in case of single link, data and VC traffic will flow on the same link.

4. Existing VC setup:

Currently Video Conferencing solution is implemented at 18 locations. The existing Video Conferencing setup is based on Tandberg solution. The existing setup consists of 16 port Tandberg MCU MPS 100 and endpoints MXP 990. The end point is capable of performing 1 + 3 multipoint VC

5. Objective:

BHEL intends to implement Video Conferencing Solution across the entire organization. The solution shall cover Corporate Office, various Manufacturing Units, Regional Headquarters, Engineering Center and Project Sites. The solution will cover about 21 permanent locations and about 130 project sites in addition to VC solution for top management and other senior management. Normally Project Sites are far away from City & many of them are remotely located. The solution shall provide business-class enterprise level video conferencing solution that will enable BHEL Management and officials to interact, plan, discuss and review

various projects under execution within and outside the country. The objective of the RFP is to select a VC Solution vendor who shall **provide, maintain and operate the complete solution** (hardware and associated software), on a 5 year lease basis. The solution should be capable of integrating with the existing VC setup in the organization & it shall be responsibility of the Vendor to integrate the same.

6. Eligibility Criteria:

- 6.1.** The bidder shall be the OEMs of the MCU & Endpoints or OEM's Joint Venture Company OR Subsidiary of OEM or an authorized partner / system integrator of OEM.
- 6.2.** Joint Venture Company OR Subsidiary of OEM, Authorized Partner / System Integrator must submit documentary evidence and authorization letter from OEM in this regard, failing which their offer will be rejected.
- 6.3.** There shall be only 1 bid from each Bidder.
- 6.4.** Bidder shall have to quote for all the Items of the BOQ as specified in this document.
- 6.5.** Relevant portions, in the documents submitted in pursuance of eligibility criterion shall be highlighted. If the offer is not accompanied by all the above documents mentioned, the same would be rejected. Undertaking for subsequent submission of any of the above documents will not be entertained under any circumstances.
- 6.6.** Purchaser reserves the right to verify / confirm all original documentary evidence submitted by vendors in support of above mentioned clauses of eligibility criteria. Upon verification, evaluation / assessment, if in case any information furnished by the vendor is found to be false / incorrect, their total bid shall be summarily rejected and no correspondence on the same shall be entertained.
- 6.7. For the OEM of the Solution:**
 - 6.7.1.** Must be a manufacturer of MCU, Endpoints & Gatekeeper. Must submit a self certificate to this effect from the company's authorized signatory.
 - 6.7.2.** The OEM shall have a registered office in India. A documentary proof with complete address details and contact person details shall be submitted along with the offer.
 - 6.7.3.** The OEM should have been present in India for at least last 3 years. A documentary proof shall be submitted along with the offer.
 - 6.7.4.** The OEM shall have at least 2 Support offices in India for technical support and problem resolution. List of service centres in India to be provided.
 - 6.7.5.** The OEM must have supplied directly or through any of its partners or system integrators, the offered MCUs or its predecessor in the same series, in at least 2 enterprises in India during the last 03 years and must be working satisfactorily. The OEM must submit documentary evidence of the orders and satisfactory installation and working report of the equipment from the customer in this regard.
 - 6.7.6.** The OEM must have supplied at least 30 High Definition (720p or higher) VC Endpoints directly or through any of the partners or system integrators in at least 2 enterprises in India during the last 03 years. The VC Endpoints must have been supplied at minimum 30 different sites in a single order in each of these enterprises. The OEM must submit documentary evidence of orders received and successful execution and satisfactory working report of the equipment from at least one of the customer.

6.7.7. The OEM shall submit a self certified document- indicating details of customer (Name, Address, Phone and Email), supplied equipment details like the MCU, Endpoints, etc, supplied to the customer.

6.7.8. The OEM shall guarantee support for the entire solution for minimum 3 (Years) years after completion of 5 year lease period with regard to service and spares. A certificate to this effect shall be submitted by the OEM.

6.8. For Bidder (Authorized Partner or System Integrator):

6.8.1. Must have been an authorized partner or system integrator of the OEM for the minimum last 24 months. Shall submit a documentary proof in this regard.

6.8.2. Must have annual turnover of minimum Rs 100.00 crores per annum for the last 3 years. Attested copies of Balance Sheets of the last three years to be submitted as proof.

6.8.3. Must have executed at least 2 (two) orders, each having a minimum value of Rs. 50.00 lakhs (Rupees fifty lakhs only) for supply and installation of VC Systems in India during the last 03 years. The bidder shall submit the documentary proof of orders received with customer's contact details and satisfactory installation and working report of the equipment from the customer in this regard.

6.8.4. Bidders currently providing any VC related services anywhere in BHEL shall necessarily submit certificate towards satisfactory services specifically mentioning the contract reference number and details of services being provided.

6.8.5. Must have executed at least 2 (two) orders for VC Systems or IT related items like PCs, Servers, Network Devices, etc, on lease in the last 5 years. The combined value of such orders should be at least Rs. 10.00 crores.

6.8.6. The bidder must undertake that they would carry out Installation / Configuration / Commissioning / Operation & Maintenance of all the items like MCU, Endpoints, Display Units, etc, and associated software including any third party items supplied as part of the solution. The bidder shall submit a self certificate to this effect from the company's authorized signatory.

6.8.7. The bidder shall provide support for all the MCUs, Endpoints, other allied equipments, software, etc, including any third party items for a period of 05 (Five) Years. There shall be back-to-back agreement with the OEM of the solution for warranty and support for the entire contract period. The bidder shall submit a certificate from the OEM for back-to-back support for the complete solution as per enclosed Format given in **Annexure-I**.

6.8.8. The bidder shall have a registered office in India. A documentary proof with complete address details and contact person details shall be submitted along with the offer.

6.8.9. The bidder shall have at least 5 service centres in India covering North, East, Central, West and South regions of the country. List of service centres in India to be provided.

7. Key Activities and Dates:

S.No.	Key Activity	Date
1	Issuance of Request For Proposal (RFP)	04-09-2010
2	Last date of receiving queries from bidders	14-09-2010
3	Last date of replying to queries	20-09-2010
4	Last date and time for submission of proposals	28-09-2010: 1700hrs

5	Technical Proposal opening	29-09-2010: 1500hrs
6	Commercial Proposal opening	Will be intimated later

8. General Terms and Conditions

8.1. Ethical Standard:

Bidders are expected to observe the highest standard of ethics during the procurement and execution of this Contract. In pursuit of this policy, the Purchaser will reject a proposal for award if it finds out that the Bidder being considered for award has engaged in corrupt or fraudulent practices in competing for the Contract. For the purposes of this provision, the terms set forth below are defined as follows:

a) **“Corrupt practice”** means the offering, giving, receiving, or soliciting of anything of value to influence the action in the procurement process or in Contract execution; and

b) **“Fraudulent practice”** means a misrepresentation of facts in order to influence a procurement process including collusive practices designed to establish bid prices at artificial, non-competitive levels to deprive the Purchaser of the benefits of competition;

By signing the Bid Forwarding Letter, the Bidder represents that for the software it supplies, it is the owner of the Intellectual Property Rights in the software. Willful misrepresentation of these facts shall be considered a fraudulent practice without prejudice to other remedies that the Purchaser may take.

8.2. Integrity Pact:

The bidder shall sign an Integrity Pact, to comply with the requirements of the Transparency International Limited (TIL) and the Central Vigilance Commission (CVC) guidelines to ensure an ethical and corruption-free business environment. The proforma for the Integrity Pact is attached as **Annexure-II**. The Independent External Monitor (IEM) for this case will be Shri Kanwarjit Singh, IRS (Rtd.), D-6/12, Ground Floor, Vasant Vihar, New Delhi-110057, Ph. 09868109389

8.3. Non Disclosure Agreement:

The bidder shall sign a Non Disclosure Agreement (NDA) with BHEL. By signing the NDA, the bidder agrees not to disclose any confidential information, business or proprietary, as covered by the agreement. The proforma for the Non Disclosure Agreement is attached as **Annexure-III**.

8.4. Cost of Bidding:

The Bidder shall bear all costs associated with the preparation and submission of its bid and the Purchaser will in no case be responsible or liable for those costs.

8.5. Procedure for Submission & Opening of Bids:

Bids shall be accepted by the official inviting the tenders, in two parts, as described below, on or before the due date & time indicated in the Tender Notice.

Part-I : EMD & Techno-Commercial Bid

This part shall consist of the following:

- 1) Tender Fee in the form of Pay Order/ Bank Draft of **Rs.10,000/-** (Rupees Twenty Five Thousand only) in favour of “Bharat Heavy Electricals Limited” payable at New Delhi or Noida in case the tender documents have been downloaded from the website. In the absence of submission of tender Fee, the offer will be summarily rejected.
- 2) EMD in the form of Pay Order/ Bank Draft of **Rs.2,00,000/-** (Rupees Two Lakhs only) in favour of “Bharat Heavy Electricals Limited” payable at New Delhi or Noida. In the absence of submission of EMD, the offer will be summarily rejected.
- 3) Bounded volume of:
 - i. Technical offer/ details including literature/leaflets. The bidder can offer only as per technical specifications of the equipments. The Lessee reserves the right to accept or reject the technical offer. Price bids of only techno-commercially short listed vendors will be opened.
 - ii. Authorization by OEM’s as per format enclosed as Annexure-IV.
 - iii. No Deviation Certificate as per format enclosed as Annexure-V.
 - iv. Checklist of Make and Models offered as per format enclosed as Annexure-VI.
 - v. Checklist of PRICE BID (Unpriced Copy) as per format enclosed as Annexure-VII.
 - vi. Enclosures as defined in checklist of enclosures.
 - vii. A copy of complete RFP where each page is signed & stamped by the bidder.

Part-II : Price Bid

Price bid containing PRICES only is to be submitted (in the Price Schedule format enclosed as Annexure-VII only). Prices shall be quoted in Indian Rupees only. Vendor has to give details of applicable Duties and Taxes clearly. In case of any change in applicable duties till the time of delivery, new lease rates shall be calculated in line with the changes. The changes in the Tax rates will be applicable as per actuals, subject to documentary evidence.

Price Bid should not contain any technical details and/or Commercial Terms & Conditions as the same are supposed to be contained in PART-I only, so that the same can be evaluated before opening of Price Bid(s).

8.6. Marking On Envelope

Part-I and Part-II offers shall be submitted in two separate sealed envelopes with bidder’s distinctive SEAL and super-scribed as follows:

- Part-I :**
1. **Tender Enquiry No. and Its Description**
 2. **Due Date of Opening**
 3. **"EMD & Techno-Commercial Bid".**

- Part-II :**
1. **Tender Enquiry No. and Its Description**
 2. **Due Date of Opening**
 3. **"Price Bid" as per enclosed Format.**

Un-sealed envelopes or envelopes not super-scribed as above may not be accepted/considered.

8.7. Bid Submission

- 8.7.1. Bids shall be addressed to the official inviting Bids by name and designation and sent at the following address:

SDGM (IT-Purchase)
Bharat Heavy Electricals Limited,
CIT Hall, 2nd Floor, HRD & ESI Complex, Plot No. 25,
Sector – 16A, Noida (UP) 201301
Telephone no. : (0120) 2510505
Email : ashwini@bhel.in

- 8.7.2.** Bids can also be delivered in person to the official inviting Bids.
- 8.7.3.** Bids submitted by post shall be sent by "REGISTERED POST" only and shall be posted with due allowance for any postal delay.

8.8. Bid Opening

- 8.8.1.** PART-I (EMD & Techno-commercial Bid) may be opened on the due date and time as specified in the Enquiry Letter, in the presence of bidders who may like to attend. Part-II (Price Bid) shall be opened subsequently. However, Purchaser/Lessee reserves the right to open both the parts simultaneously i.e. Part-I and Part-II together.
- 8.8.2.** In case of public opening, date and time of Price Bid (Part-II) opening shall be intimated to the technically and commercially acceptable bidders only.
- 8.8.3.** Purchaser/Lessee also reserves the right to open the earlier i.e. superseded price bids, if any, submitted by the bidder(s), if required.
- 8.8.4.** Not more than two representatives from each bidder will be permitted to be present during tender opening.
- 8.8.5.** No correspondence shall be entertained from the bidders after the opening of Price Bid(s).
- 8.8.6.** Standard pre-printed conditions of the bidders attached to the offer will not be accepted and only those mentioned in the body of his offer will be considered.
- 8.8.7.** Unsolicited bids shall not be entertained. Unsolicited revised Price Bids also, shall not be entertained at any stage of the tendering process and will lead to automatic disqualification of the party's bid.
- 8.8.8.** No Literature, Pamphlets other than what is specified is to be enclosed. All such enclosures shall be considered as unread and also will not be considered as part of the quotation.
- 8.8.9.** Manufacturer's name, trade Mark or Patent No., if any, should be specified.
- 8.8.10.** Purchaser/Lessee reserves the right to negotiate the tender, if required.

8.9. Validity of Offer

Offer shall be kept valid for FOUR months from the due date of tender opening (Part-I) for Purchaser/Lessee's acceptance.

8.10. Deviations

Bids shall be submitted strictly in accordance with the requirements and terms & conditions of the Tender Enquiry. Vendors have to submit a "No Deviation Certificate" in Part-I of the offer as per Annexure-V.

Technical & Commercial - No deviation is acceptable.

8.11. Language of the Bid & Corrections

- 8.11.1.** The bidder shall quote the rates in Hindi/English language and international numerals only. The metric system of units shall be used, for the purpose of tender.
- 8.11.2.** Bidder shall fill the tender documents as per formats enclosed in this tender enquiry. All entries and signatures in the bid shall be in **BLUE/BLACK INK** only. Each page of the bid shall be signed and stamped using official seal of the company by the bidder.
- 8.11.3.** All entries shall be filled in neat and legible handwriting. No over-writings, erasures and corrections are permitted and may render such bids liable for rejection.
- 8.11.4.** However, if any cancellations, corrections and insertions are in the bid, the same shall be duly attested by the bidder.

8.12. Rejection Of Bid and Other Conditions

- 8.12.1.** Any format not properly filled, partially filled or not filled will make the bid liable for rejection. Bidders are requested to note that all columns, rows and spaces provided to fill up the data must be filled with relevant data without fail. In case any bidder fails to do so or fills up irrelevant data, BHEL is not bound to seek clarifications on such items and will be free to reject the tender summarily.
- 8.12.2.** If required, BHEL is entitled to ask for any equipment for evaluation and all bidders are requested to note that they shall provide equipment exactly as per specification without any charge and precondition(s) to BHEL within 72 hours of receiving such notice. Upon completion of such evaluation BHEL shall return the equipment to the unsuccessful bidder. However, successful bidder's equipment will be returned only after complete delivery of the ordered equipment.
- 8.12.3.** Equipment offered must have current certifications as detailed in relevant sections. Future expectations of certification, conditional certifications, variation in certification and certification for equipment different from the make and model offered in the bid is not acceptable.
- 8.12.4.** No change in specifications, clauses of contract, Terms and Conditions, etc. shall be entertained by BHEL under any circumstances.
- 8.12.5.** Canvassing in any way concerning this tender, wrong declaration, incorrect information, misleading or incorrect certifications, etc. shall make the Bidder debarred to participate in this tender and also for a further period of 3 years in any tender of any of the BHEL units.
- 8.12.6.** The acceptance of bid will rest with the Purchaser/Lessee and does not bind him to accept the lowest or any bid. The Purchaser/Lessee reserves to itself, full rights for the following without assigning any reasons, whatsoever:
 - a) to reject any or all the bids.
 - b) to increase or decrease the quantities.
- 8.12.7. Late Bids:** Any proposal received by BHEL after the deadline for submission of proposal shall be summarily rejected and returned unopened to the bidder.
- 8.12.8.** The offer is liable to be rejected, if it is found after the Price Bid Opening that the Checklist of Price Bid submitted by the bidder, as a part of Part-I offer, is different from the actual Price Bid.

8.12.9. If the bidder deliberately gives wrong information in his bid, Purchaser/Lessee reserves the right to reject such a bid at any stage or to cancel the Order/Contract, if awarded and forfeit the EMD/ security deposit/ Performance Bank Guarantee, if any.

8.12.10. If the Prices/Rates of one or more of the enquired equipments have not been quoted, the offer is liable to be rejected.

8.12.11. Non-compliance with any of the requirements and instructions of the Tender Enquiry may result in the rejection of the bid.

8.13. Clarification on Bidding Documents:

The Bidder is expected to carefully go through this Tender Document and understand the functional requirements thoroughly before submitting their offer. All legitimate queries and clarifications regarding this tender must be submitted in writing to the undersigned by **14.09.2010**. The reply to the same will also be made available from the undersigned by **20.09.2010**. BHEL will not entertain or respond to bidders' queries received after **14.09.2010**.

8.14. Amendment of Bidding Documents:

The Purchaser may at its sole discretion amend the Bidding Documents at any time prior to the deadline for submission of bids. However in case of such amendment, the bid submission date may be extended at the discretion of the purchaser.

Amendments made prior to submission of bid will be provided in the form of Addenda / Corrigendum to the Bidding Documents and will be posted on the BHEL website (<http://www.bhel.com>) in Tender Notification section under the original tender enquiry number.

8.15. Evaluation and Comparison of Bids:

8.15.1. Totals / Gross Total of Prices should be indicated both in words as well as in figures. If there is a difference between price quoted in words and figures or if there is any other price discrepancy, higher value(s) will be considered for evaluation and lower values will be considered for ordering.

8.15.2. Though offer of higher warranty/configuration/rating, than what is required as per tender specifications, may be accepted, no extra weightage or preference will be given for the same.

8.15.3. Prices of optional items, if any, shall also be considered for Price evaluation and comparison, unless stated otherwise.

8.15.4. Purchase preference would be extended to Central Public Sector Enterprises (CPSE's). Accordingly, where all things being equal, purchase preference will be granted to the CPSE's at the lowest valid price bid (L1). This preference would be available to CPSE's provided there is valid Office memorandum to this effect from the concerned Ministry.

8.15.5. After finalizing the techno-commercial offers, BHEL may adopt Reverse Auction process for arriving at the lowest price offer. BHEL will also claim depreciation as per provisions of the Income Tax Act.

8.15.6. The Purchaser will evaluate and compare the bids that have been determined to be substantially responsive. The bidding evaluation is based on L1 criteria. Further the tender is **NOT divisible**. The evaluation of responsive bids shall be done in 3 stages:

Stage-I: Evaluation Of Response To Eligibility Criteria:

These are mandatory requirements to be met by the Bidder. Only those Bidders who meet all the requirements as per eligibility criteria shall be considered for stage II evaluation.

Stage-II: Evaluation Of Technical & Commercial Bids:

This shall be the second stage of the evaluation by the Purchaser. Only those Bidders who adhere to the purchaser's technical and commercial requirements shall be considered for next stage of evaluation.

Commercial and Technical bid of the vendor shall be opened and evaluated for acceptability of commercial terms, deviations and technical suitability. The Bidders should meet the commercial conditions as defined in the bidding documents.

BHEL's Technical Committee will then evaluate the Technical bid submitted by the Bidders. During the Technical Evaluation of the bid, the purchaser may ask for additional information / resources to validate the bid. These may include technical documents / white papers from OEM or third party, references, demonstration of a proof of concept or solution, visit to supplier's lab or their clients reference site, etc.

Stage –III: Evaluation of the Price Bid:

Bidders clearing the Techno-Commercial evaluation will have their Price Bids opened. The total cost of the bid will be calculated as under:

- i. Total cash outflow for 5 years on lease basis for Hardware, Software, Facility Management, Redeployment, etc, including duties, taxes, warranty & support for the entire lease period.
- ii. The bid having the least total cash outflow for 5 years will be considered L1 bidder. Evaluation of L1 ranking will be based on net of CENVAT/VAT basis, if any. The L1 Bidder shall be eligible for award of contract.

8.16. Taxes:

The bidder shall clearly specify the current applicable taxes and their current rates. Any taxes currently applicable but not specified in the bid/offers shall not be to BHEL's account.

8.17. Purchaser's Right to accept or Reject any or all Bids:

The Purchaser reserves the full right to accept or reject any bid or to annul the bidding process and reject all bids at any time prior to Contract award, without thereby incurring any liability to the Bidders.

8.18. Exclusions:

The Bidder shall clearly indicate the items under "Exclusions" head, which are excluded from the scope of Bidder's work, if any.

8.19. Statutory Obligations:

All statutory obligations arising out of this contract (like Insurance, PF, etc. of man power deployed by the bidder) shall rest with the successful bidder.

8.20. Liabilities from the Contract

Any liabilities arising out of this contract (like injury, fatal/non-fatal, to the personnel of the successful bidder or any third party/contractor employed by the bidder) shall be to the successful bidder's account only. BHEL shall not be liable in any such eventuality.

8.21. Delivery & Installation Schedule:

- 8.21.1.** The Bidder shall be responsible for timely delivery, installation & commissioning of all the hardware & software given in the scope of supply/work at all BHEL locations. All the hardware & software shall be delivered and successfully installed and commissioned within 4 months (120 days) from the date of placement of order.
- 8.21.2.** Failure in delivery or installation within 120 days will entail Late Delivery Charges as per the LD clause of the contract.
- 8.21.3.** BHEL may take deliveries in a staggered manner at some of the locations. Bidder will be informed well in advance about delivery schedule for those locations.
- 8.21.4.** Acceptance date for Class A locations will be a common date after successful PG test, whereas at Class B locations acceptance will be given as and when the site is commissioned and PG test is successfully done.

8.22. Insurance :

Insurance for the complete Systems/ Goods shall be arranged by the Vendor/ Lessor at his own risk and cost during transit, movement, storage and throughout the period of lease. Purchaser/ Lessee, under any circumstances, will not be responsible for any loss/ damage/ theft of any Systems/ goods, due to any reasons, whatsoever. Claim(s) etc., if any, will be dealt with the underwriters directly by the Vendor/ Lessor. Evidence of insurance policy shall be submitted to BHEL. If the lessor fails to renew the policy before the expiry, BHEL may affect the insurance from the lease rental.

For any theft of or damage to any of the supplied items, where the vendor is filing a claim with the insurance agency; the vendor shall replace the item on its own within 7 working days of the reporting of the incident, after which SLA and Risk Purchase clauses of the contract will become applicable.

8.23. Indemnity:

Vendor/Lessor shall fully indemnify and keep indemnified the Purchaser/Lessee against all claims which may be made in respect of the use of System / Software / Item(s) / services supplied / rendered by the Vendor / Lessor, for infringement of any rights protected by patent, registration of designs or trademarks and legality of the Software. However the Vendor/ Lessor will have no obligation for any claim of infringement arising from third party products not supplied in the order, modifications and technical information/ instructions advised by purchaser and use of products prohibited by product manuals.

All such claims in this regard will be settled as per Indian Laws.

In the event of any such claims being made against the Purchaser/ Lessee, Purchaser/Lessee will inform in writing to the Vendor/Lessor who shall at his own risk and cost either settle any such dispute or conduct any litigation that may arise there from.

8.24. Risk Purchase:

- 8.24.1.** Purchaser/Lessee shall reserve the right to terminate the order/contract and purchase from elsewhere at the risk and cost of the Vendor/Lessor, either the whole or part of the Systems/goods, which the Vendor/Lessor has failed to deliver within the stipulated delivery period or if the same were not available, the best and the nearest available substitute(s) thereof. The Vendor/Lessor would be liable to compensate the Purchaser/Lessee for any loss, which the Purchaser/Lessee may sustain by reason of such purchase. This clause will be operated only after completion of delivery period including extended period with penalty.

8.24.2. In case of continuous non-performance of a system or a component or non-availability of support or service for more than 15 days, Purchaser / Lessee reserves the right to invoke the Risk Purchase clause and replace/rectify/repair the faulty system or component or buy the support / service from market at the risk and cost of the Vendor/Lessor.

8.25. Arbitration:

In all cases of disputes emanating from and in reference to this contract, the matter shall be referred to the arbitration. All disputes or differences between the parties will be resolved through arbitration governed by "The Arbitration and Conciliation Act, 1996" as amended from time to time. The venue of arbitration shall be in New Delhi. However, till the time the decision of the arbitrator is not announced, the Bidder/Vendor shall continue to provide its services to BHEL as per the contract.

8.26. Additional Facility Required In Future On Supplied Equipment

In case any additional facility is required in future on any of the supplied equipment, the Vendor/Lessor shall provide the same at mutually agreed terms & conditions.

8.27. Force Majeure:

Vendor/Lessor shall not be responsible for delay in delivery resulting from acts/events beyond his control, provided notice of the happening of any such act/event is given by the Vendor/Lessor to the Purchaser/Lessee within 15 days from the date of its occurrence. Such acts/events shall include but not be limited to acts of God, war, floods, earthquakes, strikes, lockouts, epidemics, riots, fire or Governmental regulations superimposed after the date of order/contract.

8.28. Patent & Trademark:

Vendor/Lessor shall at all times indemnify the Purchaser/Lessee against all claims which may be made in respect of the Systems/goods/Software supplied by the Vendor/Lessor, for infringement of any right protected by patent, registration of designs or trademarks and legality of usage of Software. In the event of any such claims being made against the Purchaser/Lessee, Purchaser/Lessee will inform the Vendor/Lessor who shall at his own cost either settle any such dispute or conduct any litigation that may arise there from.

8.29. Terminal payment:

BHEL shall have the right to acquire or surrender all the equipments at the end of the lease period. In case BHEL decides to acquire the equipments, a nominal charge of Re.1.00 per equipment will be paid as terminal payment.

In case of termination or surrender of equipments by BHEL at the end of the lease period, Vendor/ Lessor will remove the equipment from Purchaser/Lessee's premises at his own risk and cost after due permission from BHEL.

9. Special Terms and Conditions

9.1. Installation:

The supply, transportation and installation of the equipment and interconnections LAN / network, etc, required to be completed for commissioning shall be in the scope of the supplier. The vendor shall demonstrate the following scenarios as part of the installation:

- 9.1.1.** Successful installation, commissioning and running of MCU, Gatekeeper, Gateway, Central Management System, Endpoints, etc, with excellent acceptable performance and quality.
- 9.1.2.** Setting of point-to-point & multipoint IP VC calls with excellent acceptable performance and quality.
- 9.1.3.** Setting of point-to-point & multipoint ISDN VC calls with excellent acceptable performance and quality.
- 9.1.4.** Setting of point-to-point & multipoint IP & ISDN VC calls with external agencies / customers with excellent acceptable performance and quality.
- 9.1.5.** Fine-tuning of configuration and settings for best VC quality
- 9.1.6.** Integration with BHEL's existing VC Systems & Solution

9.2. Performance Guarantee Tests (PG Tests):

The Performance Guarantee Test shall start after installation and commissioning of all the Hardware & Software at Corporate Office, Units, Regional Head Quarters and Project Sites. The Performance Guarantee Tests (and repeats of such tests limited to a maximum of two) shall be the primary responsibility of the Supplier, but shall be conducted with the full cooperation of the BHEL to ascertain whether the supplied System meets the standard of performance and complete functionality as desired by the purchaser.

The performance test will be done individually and collectively for all MCUs, Endpoints, Display Units as individual systems and as a total system. After successful completion of installation and commissioning, PG test shall be conducted for ascertaining the performance of systems for business-class best quality VC performance for a minimum 07 days continuously. The Performance Acceptance Tests shall be conducted by conducting point-to-point and multipoint VC sessions on IP & ISDN within and outside BHEL continuously for 7 days to ascertain that all components of the solution are working in the desired fashion individually and together to give the best VC performance. If the system is found to be lacking in meeting Performance Guarantee Test, the vendor shall rectify or fine tune parameters for obtaining the best VC quality. Once the vendor offers the system for testing again, the systems will be tested again continuously for 7 days. If after the 2nd testing, the performance of the VC or its quality is not found up to the mark, the supplied equipment is liable to be rejected.

9.3. Commissioning Certificate

On successful installation, configuration and PG test of individual components and the solution as a whole, the supplier shall submit the following as part of the commissioning:

- 9.3.1.** Configuration details of MCU, Gatekeeper, Gateway, Display Units, VC Endpoints.
- 9.3.2.** IP address, name, etc, details of all items.
- 9.3.3.** Network diagrams / cabling scheme.

- 9.3.4. Security scheme for entire solution.
- 9.3.5. Details of Backup policy and configuration

On submission of the above and after successful PG test, BHEL will issue a **Commissioning Certificate** for the individual locations.

9.4. Project Implementation Schedule:

Implementation of VC Equipments shall be done in two Phases. The Phase-I will cover VC solution for top management, EDs & GM (I/c), PC based VC solution, permanent locations and project sites specified in **Annexure-VIII**.

Order for Phase-I shall be placed initially. However order for rest of the locations shall be placed in Phase-II in a staggered manner **within one and a half years time period after placing Phase-I order**. The tentative list of total locations covering Phase-I & Phase-II is given in Annexure-IX.

Bidder must assign a competent Project Manager for the installation and commissioning work. Also, a Time Bar Chart indicating starting and completion of dates of each activity, i.e. Supply, Installation, and acceptance, etc. shall be submitted along with the offer. The Tender shall be considered incomplete without this information.

9.5. Shifting and Redeployment:

- 9.5.1. VC equipment will be placed at a Project site typically for a duration of about three years. It may be required to be shifted to new location at any place within India as desired.
- 9.5.2. The dismantling, packing, transportation including transit insurance, unpacking at new site, successful reinstallation and commissioning at the new location shall be in the scope of the bidder. BHEL will pay a uniform lumpsum amount, as quoted in the price bid, for the above activities excepting Transportation & Transit Insurance Charges which will be paid at actual on submission of Original Bills.
- 9.5.3. 30 days notice period will be provided to the vendor for shifting and redeployment. If shifting and redeployment is not completed within 30 days of notice, no lease charges will be paid for the period above 30 days till the date equipment is shifted and successfully reinstalled.

9.6. Service Level Agreement (SLA):

As the facility will be used extensively by the Top Management of BHEL, the supplier shall provide support on 24x7x365 basis for all the hardware & software items. The supplier shall ensure that the following SLA parameters are met:

9.6.1. Definitions:

Non Availability:

- 9.6.1.1. Is defined as the service is not available or service is available with degraded performance.
- 9.6.1.2. Any equipment / service working with degraded performance & if not fully resolved within stipulated time shall be considered non-available including the time period during which it was working with degraded performance.

9.6.1.3. If the quality of audio or video is poor for more than 15 minutes at a stretch even when sufficient Bandwidth is available for VC & the packet loss between the endpoints is not more than 1%.

9.6.2. SLA Requirements:

9.6.2.1. An uptime of **99.5%** on all hardware & software products per month at Class A locations

9.6.2.2. An uptime of **99.0%** on all hardware & software products per month at Class B locations

9.6.2.3. Same business day support on all hardware & software products

9.6.2.4. Any faulty hardware component shall be repaired or replaced with Standby Equipment of similar configuration within (06) six hours / (12) hours at class A locations and within 24 hours at class B locations after logging the call. Subsequently it will be replaced by a New One/repaired one. The severity of the problem and the maximum time taken to resolve the problem / replace the component shall be as per the following table:

S.No.	Item	Component	Class of Location	Service / Performance Affected	Problem Severity	Expected Restoration Time (Hrs)
1	MCU	Any Redundant Component like Card, NIC, Power Supply, etc.	A	No	Level 1	12
2	MCU	Any Component Without redundancy or whose redundant component has already failed	A	Yes	Level 2	6
3	MCU	Any software (IOS) error, etc.	A	Yes	Level 2	6
4	Gatekeeper	Any Redundant Component like Card, NIC, Power Supply, etc.	A	No	Level 1	12
5	Gatekeeper	Any Component Without redundancy or whose redundant component has already failed.	A	Yes	Level 2	6
6	Gatekeeper	Any software (IOS) error, etc.	A	Yes	Level 2	6
7	Gateway	Any Redundant Component like Card, NIC, Power Supply, etc.	A	No	Level 1	12
8	Gateway	Any Component Without redundancy or whose redundant component has already failed.	A	Yes	Level 2	6
9	Gateway	Any software (IOS) error, etc.	A	Yes	Level 2	6

10	Endpoint	Any Component like Codec, Camera, NIC, Power Supply, etc.	A	Yes	Level 2	6
11	Endpoint	Any Component like Codec, Camera, NIC, Power Supply, etc.	B	Yes	Level 2	24
12	Display Unit	Any component, screen, interface, etc.	A	Yes	Level 2	6
13	Display Unit	Any component, screen, interface, etc.	B	Yes	Level 2	24
14	Central Management System	Error or non-working of any these softwares or components or modules thereof	A	No	Level 1	12
15	Central Management System	Error or non-working of any these softwares or components or modules thereof	A	Yes	Level 2	6
16	Others		A	No	Level 1	12
17	Others		A	Yes	Level 2	6
18	Others		B	No	Level 1	48
19	Others		B	Yes	Level 2	24

9.6.2.5. On-site support for all hardware & software products

9.6.2.6. If a system or component is down for more than 36 hours at a stretch at Class A location, then the downtime considered for deduction for such component or system will be 2 times, e.g., if a system was down for 40 hours at a stretch, then the downtime taken for deduction will be 80 hours. Similarly, at Class B location, if a system or component is down for more than 48 hours at a stretch, then the downtime considered for deduction for such component or system will be 2 times.

9.6.2.7. If the availability and Performance of systems is below 95% continuously over a period of 3 months at more than 25 % of the Installed Location, BHEL reserves the right to terminate the contract in full, without any cost implication to BHEL.

9.7. Penalty for SLA Non-Conformance:

At the end of each quarter downtime will be calculated for all the systems and softwares. Downtime will be calculated on per month basis. The deductions will be made as per the following formula:

Deduction (D) = downtime in minutes (d) X rental per minute (r) X multiplication factor (f)

Where Multiplication Factor will be calculated as per the following table:

Multiplication Factor Table for Class A Locations

S.No.	Uptime %	Multiplication Factor (F)
1	≥ 99.50	0.00
2	$< 99.5\% \ \& \ \geq 99.00$	1.00
3	$< 99.0 \ \& \ \geq 98.00$	1.50
4	$< 98.00 \ \& \ \geq 97.00$	2.00
5	$< 97.00 \ \& \ \geq 96.00$	3.00
6	$< 96.00 \ \& \ \geq 95.00$	4.00
7	< 95.00	5.00

Multiplication Factor Table for Class B Locations

S.No.	Uptime %	Multiplication Factor (F)
1	≥ 99.00	0.00
2	$< 99.0\% \ \& \ \geq 98.00$	1.00
3	$< 98.0 \ \& \ \geq 97.00$	1.50
4	$< 97.00 \ \& \ \geq 96.00$	2.00
5	$< 96.00 \ \& \ \geq 95.00$	3.00
6	< 95.00	4.00

9.8. Availability of Spares:

The successful bidder shall maintain at least 1 set of endpoints at Corporate Office and four Power Sector Regional Headquarters. In addition, spares of common accessories like connecting cables, remote control, etc. should be maintained at following locations:

- 1) Corporate Office, New Delhi
- 2) Haridwar
- 3) Bhopal
- 4) Hyderabad

- 5) EDN Bangalore
- 6) Trichy
- 7) PSNR, Noida
- 8) PSER Kolkata
- 9) PSWR Nagpur
- 10) PSSR Chennai

9.9. Terms of Payment:

Lease period will start only after successful installation and commissioning of all hardware and software products as per scope of work & successful completion of PG Test. Quarterly lease rental charges (after deducting pro-rata rent cut, for any SLA non-conformance) become payable at the end of each quarter.

Payments will be made within 45 days on submission of following documents:

- 9.9.1.** Invoice in duplicate.
- 9.9.2.** Delivery/Installation Report & SRV (Stores Receipt Voucher) (Duly signed by BHEL coordinator), required only at the time of first payment.
- 9.9.3.** SLA reports for the quarter (to be verified by the System Administrator).
- 9.9.4.** Performance Bank Guarantee.
- 9.9.5.** Insurance documents for all the items and its annual renewal, whenever due.

9.10. Income Tax Depreciation:

Income tax depreciation will be claimed by BHEL.

9.11. Scope of Work:

- 9.11.1.** The bidder shall Supply, Install, Integrate, Carry out Testing of Systems, Commissioning of MCU, Endpoints, Gatekeeper, Gateway, Display Units, Central Management System, and other software and other related items at all the locations listed in **Annexure-IX**.
- 9.11.2.** The bidder shall devise IP scheme in consultation with BHEL network team for the new VC solution.
- 9.11.3.** The bidder shall give recommendations on design, lighting and ambience for VC conference rooms.
- 9.11.4.** The bidder shall also integrate the offered solution with the existing VC setup at BHEL. The existing VC setup is explained in **Annexure-X**.
- 9.11.5.** The bidder shall also integrate the offered solution with the existing Microsoft OCS setup at BHEL Corporate Office. The details of the existing OCS setup and inventory are mentioned in **Annexure-XI**.
- 9.11.6.** The bidder shall carry out installation of systems, fixing, termination and inter-cabling, etc, as per the best international standards and practices.

- 9.11.7.** For installation & commissioning work, it shall be the responsibility of the bidder to arrange and provide requisite tools, etc, for carrying out the installation and commissioning job.
- 9.11.8.** All softwares to be provided as part of the solution should be licensed to “Bharat Heavy Electricals Limited”. All documents, manuals, administration manuals and software CDs should be submitted to BHEL before commissioning the systems. All softwares should come with at least two sets of CDs/DVDs, etc.
- 9.11.9.** The Bidder shall ensure that no other equipment/structure/setup gets damaged due to their activities. Any damages if caused to BHEL’s property due to Bidder’s negligence shall be rectified, repaired and borne by the Bidder at its own account.

9.12. Sub-Contracting:

Order / contract or any part thereof shall not be sub-contracted, assigned or otherwise transferred to any third party without prior written consent of the Purchaser/ Lessee.

9.13. Functional Scope for Hardware & Software:

The functional scope for hardware, software and related services as detailed in Technical Specification of Hardware, includes all activities but not limited to the following:

- 9.13.1.** Delivery of equipment at all locations of BHEL and all arrangements for loading/unloading, movement, etc.
- 9.13.2.** Handling, installation, configuration, testing, commissioning and integration at site of the ordered materials.
- 9.13.3.** Fine tuning of configuration parameters, settings, etc for smooth installation and functioning of all the systems.
- 9.13.4.** Testing based on diagnostic software to be carried out to ascertain healthiness of the equipments / hardware, backup system, etc.
- 9.13.5.** A complete project report giving all installation and configuration reports, documents, diagrams, etc, to be submitted before commissioning.
- 9.13.6.** The Bidder shall work closely in co-ordination with BHEL network team and system integrators for installation, fine tuning and configuration of the hardware and software for smooth and best quality performance of the VC systems.
- 9.13.7.** Any additional item, component, cable, software, etc. required for the successful and complete installation and functioning of the total solution shall be provided and installed by the bidder without any additional cost implication to BHEL.

9.14. Training:

The supplier should organize and provide training and related training material for:

- 9.14.1.** User Level Training for 6 to 8 batches consisting of about 20 persons each at 6 to 8 locations across the country to ensure familiarity and enable them to use the system efficiently.
- 9.14.2.** System Administration of MCUs, Gatekeeper, Gateway, Central Management System, etc, for 6 to 8 persons at Corporate Office.

- 9.14.3. The training course shall be structured and supported by programmed illustrations, video, charts, etc. The training shall be imparted by experienced personnel only. The Bidder shall provide extensive lecture notes, handouts and other training documentations.
- 9.14.4. All the Trainings should be conducted at BHEL premises on the procured VC systems. The boarding and lodging of trainer faculty will be the responsibility of the suppliers only.
- 9.14.5. The User Level training shall be of 1 to 2 days. The Admin level training shall cover all the admin features and requirements and shall be minimum of 4 days.
- 9.14.6. The faculty for all the trainings shall be from OEM of the solution only and should be highly trained and certified on the offered solution, technology and products.

9.15. Warranty & Support:

- 9.15.1. All the supplied equipment / systems (hardware/software) shall be covered under a Comprehensive On-Site Warranty for 05 (Five) years. Warranty period shall start from the date of successful commissioning of the Equipment / System. Warranty & Support shall be delivered directly by the OEM for MCU, Endpoint, Display units, associated cables, Gatekeeper, Gateway, Central Management System, etc at the central level. In case of authorized partner being the Bidder, certificate from OEM should be attached stating that the OEM will provide support directly during the warranty period, the posting of the OEM's Engineer, replacement of spares, etc.
- 9.15.2. If any document / manual / CD supplied by the supplier is found to be inadequate / incomplete within the period of the contract, the supplier shall replace/complete such document/manual/CD at their cost within 15 days' time.
- 9.15.3. **On-Site Engineers at Corporate Office:** The OEM shall post 2 (two) qualified, trained and certified engineers with proven experience of at least 2 years on VC system and solution at our Corporate Office, New Delhi. The engineers shall be available at the Corporate Office normally from 8.00 AM to 8.00 PM. However they may be required to stay for extended Hours & Holidays also , if required by BHEL. The scope of responsibility of the engineers shall include but is not limited to the following:
- 9.15.4. Health monitoring, performance monitoring, capacity monitoring & critical parameter monitoring of the MCU, Gatekeeper, Gateway, VC Endpoints, Display Units, etc, at the Corporate Office.
- 9.15.5. Scheduling of conferences in the conference room and cabins of CMD, Directors and Executive Directors, etc.
- 9.15.6. Co-ordination with other Units, Regions and Project Sites for setting up conferences.
- 9.15.7. Troubleshooting, diagnostics, fault checking, call logging, spares replacement and also carry out regular backup of system configuration, settings and critical system files.
- 9.15.8. Updation and upgradation of patches, software, operating system of all VC systems.
- 9.15.9. **On-Site Engineers at Power Sector Regional Head Quarters:** The bidder shall post one engineer each at 4 power sector regional head quarters (Noida, Kolkata, Nagpur & Chennai) for local support, call logging, setting of conferences, co-ordination with Project Sites for any VC related issues, troubleshooting and coordinating with other locations and agencies.
- 9.15.10. BHEL reserves the right to ask for a change of maintenance personnel citing reasons. The supplier shall arrange a replacement within 03 (Three) working days having the same or higher competence level.

9.15.11. The scope under warranty shall cover to provide services as described below for all the equipment (including Hardware and Software) in this tender to ensure maximum uptime and performance levels of all the VC Systems.

9.15.12. The Bidder/OEM shall be required to provide all the services based on standards and the best practices to meet or exceed the SLAs as per **Clause 9.6**. If the performance and uptime does not meet the SLA, deductions as per SLA will be done from the quarterly rental charges.

9.16. Warranty shall cover the following:

9.16.1. Repair / Replacement of faulty / defective Hardware and other supplied items inclusive of all types of spare parts etc.

9.16.2. Installation / Re-Installation / Configuration of System software and other supplied software.

9.16.3. All System Patches, Upgrades, Service Packs, etc. of the OS and all other Software supplied by the OEM must be made available free of cost during the entire warranty period (5 years).

9.16.4. Installation of System Patches, Upgrades, Service Packs etc.

9.16.5. Any change in the IP Scheme, if required, limited to VC equipments, in consultation with BHEL's Network Manager.

9.16.6. System Management:

- 1) Monitoring, logging and reporting of the equipment operation on daily basis.
- 2) Periodic health checks of the systems and implementing proactive rectification measures.
- 3) Troubleshooting Endpoints, Display Units, MCU, Gatekeeper, Gateway, etc .
- 4) Analyzing and reporting all system related issues.
- 5) Liaison with various vendors, OEMs, agencies and service providers for equipment maintenance & related work.
- 6) All incidents must be documented and logged as per the format mutually agreed upon.

9.17. MCU Administration:

MCU Administration Functions include following activities in consultation with BHEL Personnel:

9.17.1. System administration and tuning.

9.17.2. Re-installation in the event of crash/failures

9.17.3. Configuring settings and various parameters.

9.17.4. Taking regular Back-up of System Configuration & other settings.

9.17.5. Ensure proper configuration and settings.

9.17.6. Periodic System performance tuning and configuration check.

9.17.7. Addition, deletion, re-configuration of Endpoints, devices, users and sites.

9.17.8. Security management – Configuring account policy, access rights, password control as per BHEL's security policy.

9.17.9. Resolving all hardware and software related problems.

9.17.10. Escalating unresolved problems to ensure resolution as per the agreed SLA.

9.18. Performance Monitoring and Reporting:

9.18.1. Carry out regular monitoring and maintaining a log of the performance monitoring of MCU, Gatekeeper, Endpoints, Bandwidth Utilization, etc.

9.18.2. Carry out regular analysis of events and logs generated in the entire VC systems.

9.18.3. Undertake appropriate actions in accordance with the results of the log analysis to ensure optimal performance

9.19. Backup and Restore:

9.19.1. Shall regularly backup the configuration and settings of MCU, Gatekeeper, Gateway and all VC Endpoints as per the agreed backup policy.

9.19.2. Must conduct periodic restore operations of backed up data.

9.20. Supply during Warranty (Free of Cost):

9.20.1. Supply of all system software upgrades and patches.

9.20.2. Supply of future release of all OS and related system software.

9.20.3. Supply and install Security patches and bug fixes.

9.20.4. Supply of all spare parts

9.21. Offline Support:

The offline support should have:

9.21.1. 12x7x365 national telephonic support

9.21.2. Access to raise technical assistance request at hardware vendors / supplier website

9.22. Special Clauses:

9.22.1. The MCU, Endpoints, Gatekeeper, ISDN Gateway & Management System should be from a single OEM only.

9.22.2. The Bidder must give his compliance point by point.

9.22.3. Bidder must submit detailed Technical Specifications of MCU, Endpoints, Display Units, Central Management System, Gatekeeper, Gateway, etc. along with the offer. Any item(s) not conforming to the Technical Specification shall not be accepted and their total bid shall be summarily rejected and no correspondence on the same shall be entertained.

- 9.22.4.** A Responsibility Matrix for each item must be submitted detailing the responsibilities of OEM and Bidder, duly signed by the authorized signatory of OEM and Bidder along with the Technical Acceptance.
- 9.22.5.** All the items to be supplied must be NEW.
- 9.22.6.** BHEL shall not be responsible for any misinterpretation or wrong assumption by the bidder.
- 9.22.7.** All the Items must be supplied in full and complete.
- 9.22.8.** Bidders must offer all the software, licenses and support for complete solution. All Licenses must be in the name of BHEL. Licenses must clearly mention their validity period and renewal policies. All updates to software, patches and upgrades must be provided from time to time free of cost during the entire contract period.
- 9.22.9.** Availability of spares and support for MCU, Endpoints, Display Units, Gatekeeper, Gateway, etc, for a minimum period of 5 (Five) Years after the completion of warranty must be ensured.
- 9.22.10.** The bidder shall provide all other H/W or S/W items that are not explicitly mentioned herein but are required to full-fill the intended specifications by the bidder in the bid. The specifications parameters are indicative and any item of higher rating will be acceptable.
- 9.22.11.** No item shall be offered whose end-of-sale has been declared by the OEM or has been declared to be under phase out.
- 9.22.12.** Proper documentation, labeling and tagging shall be done for all the equipments used in the entire solution for easy management and maintenance.
- 9.22.13.** The following documents shall be provided in hard copy or CD format:
- 1) Technical Data Sheets of all the elements
 - 2) User manual
 - 3) Administrator Manual
 - 4) Error Handling and troubleshooting manual
 - 5) Safety and Standard Operating Practices manuals.
- 9.22.14.** The rates will be valid for a period of Two Years. BHEL, at its discretion may ask the lessor for the latest specifications in this period at the same rental charges.

10. Technical Requirements

10.1. Solution Design Requirements:

The VC solution is intended to enable BHEL's management to interact, discuss and review the status of projects with other manufacturing units, regional head quarters and project sites. It should provide a robust means to review and monitor project progress. It should also provide the capability to review project with external agencies like customers, vendors, business partners, etc. The core infrastructure should have enough redundancy to provide enough fault tolerance.

10.2. Basic Design Requirements for Multipoint Conferencing Unit at Corporate Office:

The Multipoint Conferencing Unit (MCU) is the heart of the Video Conferencing Solution. Various Manufacturing Units, Regions, Divisions & Project Sites of BHEL will be taking part in multipoint conferences among themselves and with external agencies like customers, vendors, business partners, collaborators, etc. Number of locations simultaneously participating in a conference may vary from 20 to 40. The requirement is for three high end enterprise class, highly reliable purpose-built systems that will provide multipoint conferencing facility based on latest full high definition on IP & ISDN networks. There shall be two MCU boxes at Corporate Office, New Delhi. The primary MCU shall be a highly scalable chassis based system with redundant power supplies and fans. The secondary MCU shall be an appliance based 20 port MCU. It should be possible to span conferences across the two MCU boxes and they should also act as hot standby to each other. The 3rd MCU shall be identical to the secondary MCU and will be placed at one of the Units or Regional Head Quarters.

The common minimum specifications of Multipoint Conferencing Unit at Corporate Office shall be as under:

S.No.	Basic Requirement	Bidder's Response
1	The MCU should be chassis based purpose-built platform for video conferencing and should offer reliability, availability and scalability. Should be rack mountable on a standard 19" rack.	
2	The MCU should be able to connect min. 40 sites concurrently, excluding connectivity for recording, media streaming and cascading, each at 4Mbps with HD 720p resolution @30 frames per second on IP in Continuous Presence and Voice Activated mode using same chassis.	
3	The MCU should be able to connect min. 20 sites concurrently, excluding connectivity for recording, media streaming and cascading, each at 4Mbps with Full HD 1080p resolution @30 frames per second on IP in Continuous Presence and Voice Activated mode using same chassis.	
4	The MCU should be able to conduct at least 16 Video Conferences simultaneously.	
5	It should be possible to add minimum 300 sites in the MCU Address Book	
6	The MCU should be scalable to 80 sites on HD 720p and 40 sites on Full HD 1080p in the same chassis.	

7	The MCU should have minimum 4 PRI ports for conducting VC sessions on ISDN lines with external parties / vendors / customers.	
8	<p>The MCU must be capable of transcoding on every port without loss of port count with:</p> <ul style="list-style-type: none"> a. Bitrates up to 4Mbps with H.264 per connection. b. Resolutions of QCIF, CIF, 4CIF, VGA, SVGA, XGA, ED (448p, 480p) and HD (720p and 1080p). c. All resolutions supported at 30fps with H.264. d. Video Codecs: H.263, H.263+, H.264. e. Audio codecs: G.711, G.722, G.722.1, G.729, MPEG-4 AAC or equivalent audio standard 	
9	The MCU should support video codecs: H.261, H.263, H.263+, and H.264	
10	The MCU shall support H.239 dual video without losing ports on the MCU	
11	The MCU shall support a mix of resolutions in both Voice Activated mode and Continuous Presence. Each endpoint shall receive at the maximum of its capacity without reducing the capacity of another.	
12	The MCU shall have at least 2 nos. of 100/1000Mbps fully functional Ethernet ports for Network connectivity.	
13	The MCU must support H.320/ISDN sites through an internal / external ISDN/H.320 PRI gateway/s for terminating up to 4PRI lines.	
14	The MCU shall be capable of supporting H.323, H.320, SIP, and H.235 v3 in the same conference at any bandwidth and resolution.	
15	The solution shall support Standard Definition, Enhanced Definition and High Definition in both Voice Activated and Continuous Presence mode without loss of functionality or capacity	
16	MCU must support a configurable 'Text Overlay' features, optionally displaying the party H.323 ID, or custom text, within the video frame during continuous presence or voice activated switching	
17	The MCU shall allow users to create conferences on the fly from their endpoints without the need of an operator.	
18	The MCU shall transcode video and audio on all ports, without loss of port count, regardless of bitrates, resolutions or codecs	

	that endpoints connect with.	
19	The MCU shall provide HD quality in Continuous Presence to all HD endpoints connected and deliver this even if SD or ED endpoints are part of the conference. MCU should have the ability to enhance the resolution even from the SD and ED endpoints and send to HD participant. It should not reduce the overall number of ports of the MCU.	
20	The MCU shall support down-speeding and packet error / loss concealment methods to ensure optimum video and audio quality. The MCU must provide standards based method of compensating and correcting for packet loss (of media streams, both 'to' and 'from' the MCU and terminals) of up to a minimum of 2%.	
21	The MCU shall support an external recording and video-on-demand solution device.	
22	The MCU shall provide a built-in Web server for configuration and administration.	
23	The MCU shall support various user privileges from administrator to simple guest	
24	<p>The MCU shall have an address book and scheduling features using built-in or external server. The system admin must have the ability to provision the following attributes per user / groups of users:</p> <ul style="list-style-type: none"> a. Time zone, Level of Video/Audio Services (HD, SD, Audio Only), b. Recording Policy c. Max Allowed Bandwidth for Point to Point call, multipoint call , and per conference as per service created d. The network management application must support centralized Gateway, MCU and Gatekeeper system logs. 	
25	It should be possible to configure conferences across the ports on two MCU systems.	
26	The MCU should be interoperable with the gatekeeper offered with the solution.	
27	The MCU should support G .711, G.722, G.722.1, G.723.1, G.728, G.729, MPEG-4 AAC or equivalent audio standard.	
28	<p>The MCU should support following protocols:</p> <ul style="list-style-type: none"> ➤ H .323, SIP, H.235 (AES), TLS, H.239 (dual video) 	.

	➤ H.243 (chair control), RTP, HTTP, HTTPS, DHCP, SNMP, NTP	
29	The MCU should support QoS based on DSCP and TOS/IP precedence.	

Standby MCU

S.No.	Basic Requirement	Bidder's Response
1	The MCU should be rack mountable on a standard 19" rack	
2	The MCU should be able to connect min. 10 sites concurrently, excluding connectivity for recording, media streaming and cascading, each at 4Mbps with HD 720p resolution @30 frames per second on IP in Continuous Presence and Voice Activated mode .	
3	The MCU should be able to connect min. 10 sites concurrently, excluding connectivity for recording, media streaming and cascading, each at 4Mbps with Full HD 1080p resolution @30 frames per second on IP in Continuous Presence and Voice Activated mode using same chassis.	
4	The MCU should be able to conduct at least 10 Video Conferences simultaneously.	
5	It should be possible to add minimum 300 sites in the MCU Address Book	
6	The MCU should have minimum 4 PRI ports for conducting VC sessions on ISDN lines with external parties / vendors / customers.	
7	The MCU must be capable of transcoding on every port without loss of port count with: <ul style="list-style-type: none"> f. Bitrates up to 4Mbps with H.264 per connection. g. Resolutions of QCIF, CIF, 4CIF, VGA, SVGA, XGA, ED (448p, 480p) and HD (720p and 1080p). h. All resolutions supported at 30fps with H.264. i. Video Codecs: H.263, H.263+, H.264. j. Audio codecs: G.711, G.722, G.722.1, G.729, MPEG-4 AAC or equivalent audio standard 	
8	The MCU should support video codecs: H.261, H.263, H.263+, and H.264	
9	The MCU shall support H.239 dual video without losing ports on the MCU	
10	The MCU shall support a mix of resolutions in both Voice	

	Activated mode and Continuous Presence. Each endpoint shall receive at the maximum of its capacity without reducing the capacity of another.	
11	The MCU shall have at least 2 nos. of 100/1000Mbps fully functional Ethernet ports for Network connectivity.	
12	The MCU must support H.320/ISDN sites through an internal / external ISDN/H.320 PRI gateway/s for terminating up to 4PRI lines.	
13	The MCU shall be capable of supporting H.323, H.320, SIP, and H.235 v3 in the same conference at any bandwidth and resolution.	
14	The solution shall support Standard Definition, Enhanced Definition and High Definition in both Voice Activated and Continuous Presence mode without loss of functionality or capacity	
15	MCU must support a configurable 'Text Overlay' features, optionally displaying the party H.323 ID, or custom text, within the video frame during continuous presence or voice activated switching	
16	The MCU shall allow users to create conferences on the fly from their endpoints without the need of an operator.	
17	The MCU shall transcode video and audio on all ports, without loss of port count, regardless of bitrates, resolutions or codecs that endpoints connect with.	
18	The MCU shall provide HD quality in Continuous Presence to all HD endpoints connected and deliver this even if SD or ED endpoints are part of the conference. MCU should have the ability to enhance the resolution even from the SD and ED endpoints and send to HD participant. It should not reduce the overall number of ports of the MCU.	
19	The MCU shall support down-speeding and packet error / loss concealment methods to ensure optimum video and audio quality. The MCU must provide standards based method of compensating and correcting for packet loss (of media streams, both 'to' and 'from' the MCU and terminals) of up to a minimum of 2%.	
20	The MCU shall support an external recording and video-on-demand solution device.	
21	The MCU shall provide a built-in Web server, for configuration and administration.	
22	The MCU shall support various user privileges from administrator to simple guest	
23	The MCU shall have an address book and scheduling features	

	<p>using built-in or external server. The system admin must have the ability to provision the following attributes per user / groups of users:</p> <ul style="list-style-type: none"> e. Time zone, Level of Video/Audio Services (HD, SD, Audio Only), f. Recording Policy g. Max Allowed Bandwidth for Point to Point call, multipoint call , and per conference as per service created h. The network management application must support centralized Gateway, MCU and Gatekeeper system logs. 	
24	It should be possible to configure conferences across the ports on two MCU systems.	
25	The MCU should come with external gatekeeper for IP to name mapping and registration of endpoints.	
26	The MCU should support G .711, G.722, G.722.1, G.723.1, G.728, G.729, MPEG-4 AAC or equivalent audio standard.	
27	<p>The MCU should support following protocols:</p> <ul style="list-style-type: none"> ➤ H .323, SIP, H.235 (AES), TLS, H.239 (dual video) ➤ H.243 (chair control), RTP, HTTP, HTTPS, DHCP, SNMP, NTP 	
28	The MCU should support QoS based on DSCP and TOS/IP precedence.	

10.3. Basic Design Requirements for Recording & Media Streaming System:

BHEL has a requirement for recording of video conferences and multimedia presentations for live and on-demand access. The bidder shall provide a solution for recording and streaming of Video Conferences. The solution shall provision for recording and streaming of important video conferences, an executive meeting, top management's address, a training session or any other critical event. The solution shall be from the OEM of the MCU only.

The common minimum specifications of Recording & Media Streaming System shall be as under:

S.No.	Basic Requirement	Bidder's Response
1	The recording and media streaming system should be an appliance based purpose-built system mountable on a standard 19" rack.	
2	The system should be compatible, integrable and inter-operable	

	with the offered MCU and the total VC solution. All inter-connecting cables, hardware and software required shall be supplied along with the system.	
3	The system shall have the feature to record and stream video and H.239 dual-stream presentations from any H.323 or SIP videoconferencing unit.	
4	The system shall support synchronized streaming of video and presentation in live and on-demand modes.	
5	The system should support Unicast and Multicast streaming of content.	
6	Should be compatible with all major streaming formats like Windows Media®, Flash® and QuickTime®, etc.	
7	Should have editing and library features for simple content creation and retrieval.	
8	It must be possible to easily trim the start and end time of the recording to help in cutting out any idle time in the beginning or end of the meeting.	
9	It must be possible to fast-forward , rewind and skip to a specific location in the recording	
10	Shall have the capability to record minimum 5 simultaneous H.323 or SIP video calls.	
11	Should support download of content to PC and portable media devices.	
12	The system should have a recording capacity of at least 500hours. Should have the capability to connect to the external storage also.	

10.4. Basic Design Requirements for VC System for Corporate Office:

The Corporate Office at New Delhi shall have state-of –the-art VC Systems. One VC System will be installed in the Board Room which will be exclusively used by Top Management for conducting Video Conferences with other Units, Regions, Project Sites and external agencies like customers, vendors, partners and collaborators. This room shall have a sitting arrangement of about 10 to 12 persons and will have 4x3 (approx. 12’x8’) size Video Wall display unit along with HD codec & camera installed. The other VC System will be installed in a Central Conference Room and will be used by other senior management at Corporate Office for conducting Video Conferences with other Units, Regions, Project Sites and external agencies like customers, vendors, partners and collaborators This room will have two units of 50” LCD display units (OEM integrated) installed along with HD codec & camera. The VC systems in Corporate Office is intended to enable the top management to conduct business-class VC sessions as per the following:

10.4.1. Conduct multisite VC Conferences with other BHEL manufacturing Units, Regions & Project Sites.

10.4.2. To monitor, review and follow the progress of project at sites.

10.4.3. To conduct meetings, discuss and review project status with external customers and vendors.

10.4.4. To conduct various management review meetings with other units and regions.

10.4.5. To review and share data and presentations with other units, regions and sites.

In order, to take care of the above requirements, the board room shall have a 4x3 size Video Wall and 2 numbers of high definition 1080p video endpoints installed in this room. The other Conference Room shall have OEM integrated 50" dual LCD display units with two numbers of HD codec & camera.

The bidder shall propose a solution which will enable BHEL to meet the above requirements. The solution shall provide for conducting VC sessions, sharing and viewing of business data, presentations, drawings, clips, video, etc.

The common minimum specifications of Video Wall for Board Room at Corporate Office shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	Panel Size	Each Panel of the Video Wall Shall be 50" with wide view angle	
2	Video Wall Size	Shall be 4x3 in size	
3	Resolution	Should support VGA, SVGA, XGA, SXGA, SXGA+, UXGA, 1080p, dual XGA or higher resolution	
4	Absolute Resolution	Should support 36dpi or higher	
5	Display technology	Should be based on Rear Projection DLP	
6	Aspect Ratio	Should support aspect ratio of 4:3 or higher	
7	Dynamic Contrast	Should be 5100:1 or higher	
8	Color	Should be 100% EBU	
9	Light Source	Should come with standby lamp with redundant power supply	
		Should be able to switch lamp automatically by autosensing lamp failure	
		Should be able to adjust video wall on dynamic feedback of brightness and color	
10	Lamp Switching	Should be able to switch lamp in less than 1.5secs	

11	Lamp Life	Should be min 10,000 hrs	
12	Input/Output	Should support min. 1 DVI-D in/out, 1 Dual-link DVI-D in/out	
13	Pixel Clock	Should support min 162MHz	
14	System Management	Should be able to manage the system through GUI	
		Should be able to integrate separate projection modules into a single display	
		Should support multiple access from multiple sites	
		Should support access rights and privileges for user from administrator to simple guest.	
		Should provide the health status of the system and support for troubleshooting	
		Should be able to upgrade the system over ethernet	

The common minimum specifications of Endpoint for Board Room at Corporate Office shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	General Design	Should be Full High Definition end point compatible with the offered MCU. The offered system should be an integrated system consisting of Full HD codec, Full HD camera and Full HD LCD display unit.	
2	IP Support	Should support minimum 4Mbps point-to-point & 6 Mbps multipoint on IP	
3	SIP Support	Should support 4Mbps on SIP	
5	Multisite Feature	Should be able to connect to 3 other sites concurrently on IP @720p or higher	
5	Point-to-Point Conference	Should be able to connect to other sites on Full High Definition 1080p @ 30 frames per second on IP	
6	Firewall Traversal	Should support firewall/NAT traversal based on H.460.18, H.460.19 standards	
7	Video Standards	Should support H.261, H.263, H.264 video standards	
8	Audio Standards	Should support G.711, G.722, G.722.1, 64 bit & 128 bit MPEG4 AAC or equivalent audio standard	

9	Aspect Ratio	Should support 4:3 and 16:9 aspect ratio	
10	Video Inputs	Should have minimum 2 HD Camera Input, 1 DVI-I INPUTS for PC Presentation, 1 S-Video / Composite port for interfacing with projector or any other AV equipment	
11	Video Outputs	Should have min 2 DVI-I Output and 1 Composite / S-Video ports	
12	Audio Inputs	Should have min 2 RCA/Phono inputs for stereo left and right	
13	Audio Outputs	Should have min 2 RCA/Phono outputs for stereo left and right	
14	Live Video Resolutions	Should support PAL, CIF, QCIF, 4CIF, VGA, SVGA, XGA, SXGA, HD 720p@30fps, Full HD 1080p@30fps	
15	Microphone Ports	Should have min 2 ports for connecting microphones	
16	Audio Features	<ul style="list-style-type: none"> ➤ Should have high quality digital audio ➤ Should have the feature of Automatic Gain Control (AGC) ➤ Should have the feature of Automatic Noise Reduction ➤ Should have the feature of Active lip synchronization 	
17	Dual Video Support	Should support H.239 dual video	
18	Packet Loss Mitigation	Should have mechanism to withstand network Packet Loss of at least 2% to ensure good Video and Audio quality	
19	Jitter	Should provide Dynamic jitter buffering to minimize the effect of jitter on Video & audio quality	
20	Security Features	<ul style="list-style-type: none"> ➤ Should support access rights and privileges for user from administrator to simple guest. ➤ Should provide SNMP security alerts ➤ Should provide Network Settings protection 	
21	Network Interfaces	Should have minimum 1 numbers of 100Mbps Ethernet full duplex ports for LAN Connectivity	
22	QoS Feature	Should support QoS features based on DSCP	
		Should support IP adaptive bandwidth management (including flow control)	
23	Camera	Should come with HD resolution camera supporting 1080p and 720p	
		Should have Automatic focus, brightness, white balance	
		Should provide minimum 10x zoom	
		Should support Far-end camera control	
24	System Management	Should be fully manageable through the Central Management Application provided with the solution	
		Should be manageable via embedded web server, SNMP, Telnet, etc.	

		Should support remote software upload/upgrade via web server, ftp server or ISDN	
25	Other Features	Should support Auto gatekeeper discovery	
		Should support lip-sync buffering	
		H.245 DTMF tones in H.323	
		Should have Date and Time support via NTP	
26	Accessories	Should come with 2 sets of necessary cables to connect to Display Unit, PC, and microphones	
		Should come with necessary remote control to operate the system	

The common minimum specifications of VC System for Conference Room at Corporate Office shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	General Design	Should be Full High Definition end point compatible with the offered MCU. The offered system should be an integrated system consisting of Full HD codec, Full HD camera and Full HD LCD display unit.	
2	Display unit	Should come with OEM integrated dual min 50" display unit	
3	IP Support	Should support minimum 4Mbps point-to-point & 6 Mbps multipoint on IP	
4	SIP Support	Should support 4Mbps on SIP	
5	Multisite Feature	Should be able to connect to 3 other sites concurrently on IP @720p or higher	
6	Point-to-Point Conference	Should be able to connect to other sites on Full High Definition 1080p @ 30 frames per second on IP	
7	Firewall Traversal	Should support firewall/NAT traversal based on H.460.18, H.460.19 standards	
8	Video Standards	Should support H.261, H.263, H.264 video standards	
9	Audio Standards	Should support G.711, G.722, G.722.1, 64 bit & 128 bit MPEG4 AAC or equivalent audio standard	
10	Aspect Ratio	Should support 4:3 and 16:9 aspect ratio	
11	Video Inputs	Should have minimum 2 HD Camera Input, 1 DVI-I INPUTS for PC Presentation, 1 S-Video / Composite port for interfacing with projector or any other AV equipment	
12	Video Outputs	Should have min 2 DVI-I Output and 1 Composite / S-Video ports	
13	Audio Inputs	Should have min 2 RCA/Phono inputs for stereo left and right	
14	Audio Outputs	Should have min 2 RCA/Phono outputs for stereo left and right	

15	Live Video Resolutions	Should support PAL, CIF, QCIF, 4CIF, VGA, SVGA, XGA, SXGA, HD 720p@30fps, Full HD 1080p@30fps	
16	Microphone Ports	Should have min 2 ports for connecting microphones	
17	Audio Features	<ul style="list-style-type: none"> ➤ Should have high quality digital audio ➤ Should have the feature of Automatic Gain Control (AGC) ➤ Should have the feature of Automatic Noise Reduction ➤ Should have the feature of Active lip synchronization 	
18	Dual Video Support	Should support H.239 dual video	
19	Packet Loss Mitigation	Should have mechanism to withstand network Packet Loss of at least 2% to ensure good Video and Audio quality	
20	Jitter	Should provide Dynamic jitter buffering to minimize the effect of jitter on Video & audio quality	
21	Security Features	<ul style="list-style-type: none"> ➤ Should support access rights and privileges for user from administrator to simple guest. ➤ Should provide SNMP security alerts ➤ Should provide Network Settings protection 	
22	Network Interfaces	Should have minimum 1 numbers of 100Mbps Ethernet full duplex ports for LAN Connectivity	
23	QoS Feature	Should support QoS features based on DSCP	
		Should support IP adaptive bandwidth management (including flow control)	
24	Camera	Should come with HD resolution camera supporting 1080p and 720p	
		Should have Automatic focus, brightness, white balance	
		Should provide minimum 10x zoom	
		Should support Far-end camera control	
25	System Management	Should be fully manageable through the Central Management Application provided with the solution	
		Should be manageable via embedded web server, SNMP, Telnet, etc.	
		Should support remote software upload/upgrade via web server, ftp server or ISDN	
26	Other Features	Should support Auto gatekeeper discovery	
		Should support Dynamic playout and lip-sync buffering	
		H.245 DTMF tones in H.323	
		Should have Date and Time support via NTP	

27	Accessories	Should come with 2 sets of necessary cables to connect to Display Unit, PC, and microphones	
		Should come with necessary remote control to operate the system	

The common minimum specifications of Display Unit for Conference Room at Corporate Office shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	Technology	Should be LCD based minimum 50" Display Unit	
2	Resolution	Should support HD 720p @ 30 fps & Full HD 1080p @ 60ps	
3	Contrast Ratio	2500:1 or above	
4	Aspect Ratio	Should support aspect ratio 16:9 & 4:3	
5	Brightness	900cd/sq.m or above	
6	Viewing Angle	Minimum 178 degree (horizontal)	
		Minimum 178 degree (vertical)	
7	Display Colors	Should support 1.07 billion or above	
8	Supported Display Resolution	Should support computer formats: 640*480, 60Hz, 800*600, 60Hz, 1024*768,60Hz	
9	Sound	<ul style="list-style-type: none"> ➤ Should come with auto volume leveler, sound enhancer ➤ Digital Signal Processing, ➤ Dynamic Bass Enhancement, ➤ Graphic Equaliser,Smart Sound ➤ Dolby Digital 	
10	Speakers	Should come with min. 2 built-in speakers of minimum 15W each. Should have provision to connect 2 more external speakers	
11	Connectivity	The display unit should be able to take input from PC,Projectors, DVD/CD player,VCR, TV, etc.	
		The display unit should have following interfaces :	
		2 Nos. of HDMI interface	
		2 Nos. of DVI interface (digital input)	
		USB Port	
		RGB in (D-sub 15 pin)	
		RGB out (D-sub 15 pin)	
		Audio in (RGB)	
		Component (Y,Pb,Pr) & Audio	
		Composite Video	
		S-video In (D in 4 pin)	
		AV In & AV out	

12	Power	Should work on AC 220-240 V +/- 10%	
13	Compatibility	Should be compatible with the offered video conferencing equipment	
14	Accessories	<ul style="list-style-type: none"> ➤ Should come with wall mounting bracket, connectors, ➤ Should also come with 2 sets of all necessary cables to connect to the Video Endpoint, PC, Projector, power cables, etc. ➤ Should come with the remote control to operate the system 	

10.5. Basic Design Requirements for VC System for CMD & Directors' Cabins:

The top management of BHEL (Chairman & Directors) interacts with other unit heads, project site incharge, customers, vendors, partners, collaborators and Heavy Industry Ministry Officials on a regular basis to discuss and review the status and progress of various projects. The requirement is for a state-of-the-art Video Conferencing solution that will enable the top management of BHEL to conduct business-class video conferences with all these parties to discuss, review and share information on the progress of various projects. The conferences can be point-to-point and multipoint also. The conferences will be on IP when conducted within a BHEL location or on ISDN when the other party is an external agency. The solution shall provision for IP & ISDN conferences simultaneously.

The systems proposed for the above requirement shall be of the highest quality, robustness and reliability. There shall be one 50" LCD display unit and one VC endpoint in each of the Chairman and Directors' cabins. The solution shall be an integrated solution in which the VC endpoint and the display unit are integrated in a single frame. The installation work & workmanship must be as per the best international standards. The sitting capacity of the cabins will be 5 to 10 persons each.

The common minimum specifications of Video Endpoint for Conference Room at Corporate Office shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	General Design	Should be Full High Definition end point compatible with the offered MCU. The offered system should be an integrated system consisting of Full HD codec, Full HD camera and Full HD LCD display unit.	
2	Display unit	Should come with OEM integrated single min 50" display unit	
3	IP Support	Should support minimum 4Mbps point-to-point & 6 Mbps multipoint on IP	
4	SIP Support	Should support 4Mbps on SIP	
5	Multisite Feature	Should be able to connect to 3 other sites concurrently on IP @720p or higher	
6	Point-to-Point Conference	Should be able to connect to other sites on Full High Definition 1080p @ 30 frames per second on IP	
7	Firewall Traversal	Should support firewall/NAT traversal based on H.460.18, H.460.19 standards	

8	Video Standards	Should support H.261, H.263, H.264 video standards	
9	Audio Standards	Should support G.711, G.722, G.722.1, 64 bit & 128 bit MPEG4 AAC or equivalent audio standard	
10	Aspect Ratio	Should support 4:3 and 16:9 aspect ratio	
11	Video Inputs	Should have minimum 2 HD Camera Input, 1 DVI-I INPUTS for PC Presentation, 1 S-Video / Composite port for interfacing with projector or any other AV equipment	
12	Video Outputs	Should have min 2 DVI-I Output and 1 Composite / S-Video ports	
13	Audio Inputs	Should have min 2 RCA/Phono inputs for stereo left and right	
14	Audio Outputs	Should have min 2 RCA/Phono outputs for stereo left and right	
15	Live Video Resolutions	Should support PAL, CIF, QCIF, 4CIF, VGA, SVGA, XGA, SXGA, HD 720p@30fps, Full HD 1080p@30fps	
16	Microphone Ports	Should have min 2 ports for connecting microphones	
17	Audio Features	<ul style="list-style-type: none"> ➤ Should have high quality digital audio ➤ Should have the feature of Automatic Gain Control (AGC) ➤ Should have the feature of Automatic Noise Reduction ➤ Should have the feature of Active lip synchronization 	
18	Dual Video Support	Should support H.239 dual video	
19	Packet Loss Mitigation	Should have mechanism to withstand network Packet Loss of at least 2% to ensure good Video and Audio quality	
20	Jitter	Should provide Dynamic jitter buffering to minimize the effect of jitter on Video & audio quality	
21	Security Features	<ul style="list-style-type: none"> ➤ Should support access rights and privileges for user from administrator to simple guest. ➤ Should provide SNMP security alerts ➤ Should provide Network Settings protection 	
22	Network Interfaces	Should have minimum 1 numbers of 100Mbps Ethernet full duplex ports for LAN Connectivity	
23	QoS Feature	Should support QoS features based on DSCP	
		Should support IP adaptive bandwidth management (including flow control)	
24	Camera	Should come with HD resolution camera supporting 1080p and 720p	
		Should have Automatic focus, brightness, white balance	
		Should provide minimum 10x zoom	
		Should support Far-end camera control	

25	System Management	Should be fully manageable through the Central Management Application provided with the solution	
		Should be manageable via embedded web server, SNMP, Telnet, etc.	
		Should support remote software upload/upgrade via web server, ftp server or ISDN	
26	Other Features	Should support Auto gatekeeper discovery	
		Should support Dynamic playout and lip-sync buffering	
		H.245 DTMF tones in H.323	
		Should have Date and Time support via NTP	
27	Accessories	Should come with 2 sets of necessary cables to connect to Display Unit, PC, and microphones	
		Should come with necessary remote control to operate the system	

The common minimum specifications of Display Unit for CMD & Directors's Cabin shall be identical to the display unit for Corporate Room.

10.6. Basic Design Requirements for VC System for Executive Directors' Cabins:

In BHEL, every manufacturing unit, power sector regional head quarters and other divisions are typically headed by an Executive Director (ED) or a GM (I/c). These officials quite frequently need to interact with CMD & Directors in Corporate Office, Construction Managers at Project Sites, Project Engineering & Management Division at Noida, Project Management Group at Corporate Office, various customers, vendors, partners and collaborators. The requirement is for a state-of-the-art Video Conferencing solution that will enable these officials to conduct business-class video conferences with all the above officials and parties to discuss, review and share information on the progress of various projects. The conferences can be point-to-point and multipoint also. The conferences will be on IP when conducted within a BHEL location or on ISDN when the other party is an external agency. The solution shall provision for IP & ISDN conferences simultaneously.

The solution proposed for the above requirement shall be based on the latest technology, of highest quality, robustness and reliability. It is desired to have a table top based integrated LCD display unit and the VC endpoint in the cabins of these officials.

The common minimum specifications of VC System for Executive Directors' Cabins shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	General Design	Should be a desktop based system consisting of codec, display unit, HD camera, microphone and speakers	
2	Display	Shall have an integrated LCD display Unit of minimum 20" with wide view angle screen.	
3	Speakers	Should have built-in stereo speakers	

4	Microphone	Should have built-in microphone	
5	Resolution	Both camera & display unit should support HD 720p @ 30 fps	
6	IP Support	Should support minimum 2Mbps both point-to-point and multipoint on IP	
7	SIP Support	Should support 2Mbps on SIP	
8	Multisite Feature	Should be able to connect to 3 other sites concurrently on IP	
9	Point-to-Point Conference	Should be able to connect to other sites on High Definition 720p @ 30 frames per second on IP	
10	Firewall Traversal	Should support firewall/NAT traversal based on H.460.18, H.460.19 standards	
11	Video Standards	Should support H.261, H.263, H.263++, H.264 video standards	
12	Audio Standards	Should support G.711, G.722, G.722.1, 64 bit & 128 bit MPEG4 AAC or equivalent audio standard	
13	Aspect Ratio	Should support 16:9 aspect ratio	
14	Video Inputs	Should have minimum 1 DVI-I Input for PC Presentation,	
15	Audio System	Should have 2 stereo front speakers, Integrated full range microphone	
16		Should also have a provision for audio in from PC	
17	Live Video Resolutions	Should support PAL, CIF, QCIF, 4CIF, VGA, SVGA, XGA, SXGA and HD 720p@30fps.	
18	Audio Features	<ul style="list-style-type: none"> ➤ Should have high quality digital audio ➤ Should have the feature of Automatic Gain Control (AGC) ➤ Should have the feature of Automatic Noise Reduction ➤ Should have the feature of Active lip synchronization 	
19	Dual Video Support	Should support H.239 dual video	
20	Packet Loss Mitigation	Should have mechanism to withstand network Packet Loss of at least 2% to ensure good Video and Audio quality	
21	Jitter	Should provide Dynamic jitter buffering to minimize the effect of jitter on Video & audio quality	
22	Security Features	<ul style="list-style-type: none"> ➤ Should provide SNMP security alerts ➤ Should provide Network Settings protection 	
23	Network Interfaces	Should have minimum 2 numbers of 100Mbps Ethernet full duplex ports for LAN Connectivity	
24	QoS Feature	Should support QoS features based on DSCP	
		Should support IP adaptive bandwidth management (including flow control)	

25	Camera	Should support HD 720p or higher resolution camera	
		Should have Automatic/manual focus, brightness, white balance	
26	System Management	Should be fully manageable through the Central Management Application provided with the solution	
		Should be manageable via embedded web server, SNMP, Telnet, etc.	
		Should support remote software upload/upgrade via web server	
27	Other Features	Should support Auto gatekeeper discovery	
		Should support Dynamic playout and lip-sync buffering	
		Should support H.245 DTMF tones in H.323	
		Should have Date and Time support via NTP	
28	Accessories	Should come with 2 sets of necessary audio, video and power cables	
		Should come with necessary remote control /dial pad / touch pad to operate the system	

10.7. Basic Design Requirements for VC System for Manufacturing Units & Power Sector Regional Head Quarters:

Officials in Units & Regions need to regularly interact, discuss, plan and review various projects with Corporate Office, Project Management Group, Project Engineering & Management Division, other Units, Project Sites, various customers, vendors and business partners. The requirement is for a room based business-class state-of-the-art Video Conferencing solution that will enable officials in these units and regions to interact, discuss, review projects and share information, presentations, drawings, etc, with all other concerned units and agencies. The conferences can be point-to-point and multipoint also. The offered solution should work on IP as well as ISDN on point-to-point and multipoint basis.

The systems proposed for the above requirement shall be of the highest quality, robustness and reliability. There shall be two 50" LCD display units with a full high definition VC endpoint at each of these locations. The solution shall be OEM integrated solution in which the VC endpoint and the display units are integrated in a single frame. The installation work & workmanship must be as per the best international standards. The sitting capacity of the rooms will be typically between 15 to 20 persons.

The common minimum specifications of VC System for Units & Regional Head Quarters shall be as under:

VC Endpoint:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	General Design	Should be High Definition end point compatible with the offered MCU. The offered system should be an OEM integrated system consisting of HD codec, HD camera and HD LCD display unit.	
2	Display Unit Size	Should be min 50"	

3	IP Support	Should support minimum 4Mbps point-to-point & 6 Mbps multipoint on IP	
4	ISDN Support	Should have minimum 1 ISDN PRI ports	
5	SIP Support	Should support 4Mbps on SIP	
6	Multisite Feature	Should be able to connect to 3 other sites concurrently on IP and ISDN	
7	Point-to-Point Conference	Should be able to connect to other site on High Definition 720p @ 30 frames per second on IP and ISDN	
8	Firewall Traversal	Should support firewall/NAT traversal based on H.460.18, H.460.19 standards	
9	Video Standards	Should support H.261, H.263, H.263+, H.264 video standards	
10	Audio Standards	Should support G.711, G.722, G.722.1, G.728 64 bit & 128 bit MPEG4 AAC audio standards or equivalent	
11	Aspect Ratio	Should support 4:3 and 16:9 aspect ratio	
12	Video Inputs	Should have minimum 1 HD Camera Input, 1 DVI-I INPUTS for PC Presentation, 1 S-Video / Composite port for interfacing with projector or any other AV equipment	
13	Video Outputs	Should have min 2 DVI-I Output and 1 Composite / S-Video ports	
14	Audio Inputs	Should have min 2 RCA/Phono inputs for stereo left and right	
15	Audio Outputs	Should have min 2 RCA/Phono outputs for stereo left and right	
16	Live Video Resolutions	Should support PAL, CIF, QCIF, 4CIF, VGA, SVGA, XGA, SXGA, HD 720p@30fps or higher.	
17	Microphone Ports	Should have min 3 ports for connecting microphones	
18	Audio Features	<ul style="list-style-type: none"> ➤ Should have high quality digital audio ➤ Should have the feature of Automatic Gain Control (AGC) ➤ Should have the feature of Automatic Noise Reduction ➤ Should have the feature of Active lip synchronization 	
19	Dual Video Support	Should support H.239 dual video	
20	Packet Loss Mitigation	Should have mechanism to withstand network Packet Loss of at least 2% to ensure good Video and Audio quality	
21	Jitter	Should provide Dynamic jitter buffering to minimize the effect of jitter on Video & audio quality	
22	Security Features	<ul style="list-style-type: none"> ➤ Should support access rights and privileges for user from administrator to simple guest. ➤ Should provide SNMP security alerts ➤ Should provide Network Settings protection 	

23	Network Interfaces	Should have minimum 1 numbers of 100Mbps Ethernet full duplex ports for LAN Connectivity	
24	QoS Feature	Should support QoS features based on DSCP and TOS/IP Precedence	
		Should support IP adaptive bandwidth management (including flow control)	
25	Camera	Should come with HD 720p or higher resolution camera	
		Should have Automatic focus, brightness, white balance	
		Should provide minimum 7x zoom	
		Should support Far-end camera control	
26	System Management	Should be fully manageable through the Central Management Application provided with the solution	
		Should be manageable via embedded web server, SNMP, Telnet, etc.	
		Should support remote software upload/upgrade via web server, ftp server or ISDN	
27	Other Features	Should support Auto gatekeeper discovery	
		Should support Dynamic playout and lip-sync buffering	
		H.245 DTMF tones in H.323	
		Should have Date and Time support via NTP	
28	Accessories	Should come with 2 sets of necessary cables to connect to Display Unit, PC, and microphones	
		Should come with necessary remote control to operate the system	

Display Unit:

Two Units of 50" each LCD display Units (OEM integrated with Codec & Camera) shall be supplied and installed in the Conference Rooms at Manufacturing Units & Regional Headquarters. The minimum technical specifications for the display units shall be identical to the requirements for display unit for Corporate Office Conference Room.

10.8. Basic Design Requirements for VC System for Project Sites:

Project sites are the customer sites where BHEL is executing projects like setting up power plants for our customers like NTPC, NHPC, State Electricity Boards, and many other private agencies. These sites are typically in remote areas. However, at all of these sites, an MPLS or MLLN link of minimum 2Mbps uncompressed on an Fibre / RF / Copper last mile is already or will be provisioned from service providers M/s Reliance Infocomm Ltd or M/s BSNL Ltd. The officials working at a project site need to interact with their Regional Head Quarters, Various Manufacturing Units, Corporate Office, Project Management Group, Project Engineering & Management Division, customers, vendors, collaborators, business partners, etc.

The requirement is for a room based business-class state-of-the-art Video Conferencing solution that will enable the site officials to interact, discuss, review projects and share information, presentations, drawings, etc, with all

other concerned units, regions and agencies. The conferences can be point-to-point and multipoint also. The offered solution should work on IP as well as ISDN on point-to-point and multipoint basis.

The systems proposed for the above requirement shall be of the highest quality, robustness and reliability. There shall be one 50" LCD display unit and full high definition VC endpoint at each of these sites. The VC Endpoint & display unit shall be an integrated system. The installation work & workmanship must be as per the best international standards. The sitting capacity of the rooms will be typically between 5 to 10 persons.

The common minimum specifications of VC System for Project Sites shall be as under:

VC Endpoint:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	General Design	Should be High Definition end point compatible with the offered MCU. The offered system should be an OEM integrated system consisting of HD codec, HD camera and HD LCD display unit.	
2	Display Unit Size	Should be min 42"	
3	IP Support	Should support minimum 2Mbps point-to-point & 2 Mbps multipoint on IP	
4	ISDN Support	Should have minimum 4 ISDN BRI ports	
5	SIP Support	Should support 2Mbps on SIP	
6	Multisite Feature	Should be able to connect to 3 other sites concurrently on IP and ISDN	
7	Point-to-Point Conference	Should be able to connect to other site on High Definition 720p @ 30 frames per second on IP and ISDN	
8	Firewall Traversal	Should support firewall/NAT traversal based on H.460.18, H.460.19 standards	
9	Video Standards	Should support H.261, H.263, H.263+, H.264 video standards	
10	Audio Standards	Should support G.711, G.722, G.722.1, G.728, 64 bit & 128 bit MPEG4 ACC or equivalent audio standard	
11	Aspect Ratio	Should support 16:9 aspect ratio	
12	Video Inputs	Should have minimum 1 HD Camera Input, 1 DVI-I INPUTS for PC Presentation, 1 S-Video / Composite port for interfacing with projector or any other AV equipment	
13	Video Outputs	Should have min 1 DVI-I Output and 1 Composite / S-Video ports	
14	Audio Inputs	Should have min 2 RCA/Phono inputs for stereo left and right	
15	Audio Outputs	Should have min 2 RCA/Phono outputs for stereo left and right	
16	Live Video Resolutions	Should support PAL, CIF, QCIF, 4CIF, VGA, SVGA, XGA, SXGA, HD 720p@30fps or higher.	

17	Microphone Ports	Should have min 2 ports for connecting microphones	
18	Audio Features	<ul style="list-style-type: none"> ➤ Should have high quality digital audio ➤ Should have the feature of Automatic Gain Control (AGC) ➤ Should have the feature of Automatic Noise Reduction ➤ Should have the feature of Active lip synchronization 	
19	Dual Video Support	Should support H.239 dual video	
20	Packet Loss Mitigation	Should have mechanism to withstand network Packet Loss of at least 2% to ensure good Video and Audio quality	
21	Jitter	Should provide Dynamic jitter buffering to minimize the effect of jitter on Video & audio quality	
22	Security Features	<ul style="list-style-type: none"> ➤ Should support access rights and privileges for user from administrator to simple guest. ➤ Should provide SNMP security alerts ➤ Should provide Network Settings protection 	
23	Network Interfaces	Should have minimum 1 numbers of 100Mbps Ethernet full duplex ports for LAN Connectivity	
24	QoS Feature	Should support QoS features based on DSCP and TOS/IP Precedence	
		Should support IP adaptive bandwidth management (including flow control)	
25	Camera	Should support HD 720p or higher resolution camera	
		Should have Automatic focus, brightness, white balance	
		Should provide minimum 7x zoom	
		Should support Far-end camera control	
26	System Management	Should be fully manageable through the Central Management Application provided with the solution	
		Should be manageable via embedded web server, SNMP, Telnet, etc.	
		Should support remote software upload/upgrade via web server.	
27	Other Features	Should support Auto gatekeeper discovery	
		Should support Dynamic playout and lip-sync buffering	
		H.245 DTMF tones in H.323	
		Should have Date and Time support via NTP	
28	Accessories	Should come with 2 sets of necessary cables to connect to Display Unit, PC, and microphones	
		Should come with necessary remote control to operate the system	

Display Unit:

One Unit of 50" LCD display Unit shall be supplied and installed in the Conference Rooms at all sites. The minimum technical specifications for the display unit shall be identical to the requirements for display unit for Corporate Office Conference Room.

10.9. Basic Design Requirements for Desktop Based Video Conferencing Solution:

Many a time, a user needs to discuss, interact and review with other user, some issues or points on one to one basis. The conference room may not be always available or it may not be economical to use the main setup for such a small video session. The users should be able to interact with the help of their desktop PCs or laptops.

The requirement is for a desktop based Video Conferencing solution that will enable such users to interact, discuss, review projects and share information, presentations, drawings, etc, with the other user in other units, regions and sites. The conferences will generally be point-to-point, but the solution should have the provision for multipoint video conferences also. The offered solution should work on IP on common windows desktops (windows xp/vista/7).

The common minimum specifications of Desktop based VC System shall be as under:

S.No.	Parameter / Feature	Basic Requirements	Bidder's Response
1	Concurrent Calls	Should support 200 concurrent calls	
2	Bandwidth	Should support min. 128 kbps bandwidth	
3	Video Standards	Should support H.264,H.263+,H.263 video standards	
4	Video Features	Should support Far end view as well as Selfview	
5	Video Resolution	Should support Native PAL: CIF or higher	
		Should support Native PC Resolutions: VGA,QVGA	
		Should support Wide Resolutions: w720p (1280x720 pixels)- Transmit and Receive	
6	Audio Standards	Should support G.711, G.722.1, MPEG4 AAC or equivalent audio standards	
7	Audio Features	Should support min. 20 kHz wideband audio subsystem	
		Should provide adaptive, acoustic echo cancellation	
		Should support packet loss concealment	
8	Content Sharing	Should have the feature to select an application and share content and presentations with standards compliant devices on the far end	
9	Interoperability	Should be Interoperable with H.323 systems	
10	User Interface	Should have intuitive user interface with easy access to phonebooks and presence status	

		Should have the Presence indication on contacts	
		Should provide the Call Details Record	
		Should support Resolution settings control	
11	Jitter	Should provide Jitter handling to minimize the effect of jitter on Audio and video quality	
12	Protocols Supported	Should support H.323, TCP/IP, UDP, RTP/RTCP, DTMF (in-band and out-of-band), H.239	
13	Camera Requirements	Should be designed to support all windows compatible web cameras	

10.10. Design Requirements of Central Management System:

The entire Video Conferencing Solution shall be manageable through a single central management system. It should have the capability to configure any of the endpoints, MCU, gateway, gatekeeper, update the settings, upgrade the software of all the endpoints centrally from a single console, view the statistics like call details, bandwidth utilization reports, packet loss, jitter, errors, etc. The complete hardware and software required for this management system should be supplied.

The common minimum specifications of Central Management System are as under:

S.No.	Features/Components	Minimum Required Specifications	Bidder's Response
1	Management	The system should be able to manage on-site and remote site video calls.	
		Should provide complete conference overview on one screen.	
2	System Upgrades	Should provide automatic download of new software and corresponding release keys.	
3	VC Control	The system should provide to schedule, initiate and terminate video conferences.	
4	Monitoring & Reporting	The system should monitor and report statistics of all video conferences. Should show the bandwidth of each call, error rate, packet loss, jitter, etc.	

5	System Control	<ul style="list-style-type: none"> ➤ Should provide the following: ➤ Phonebook access ➤ Change video layouts ➤ Volume control and audio mute/unmute ➤ Microphone on/off ➤ Edit local phone books ➤ Send messages to systems ➤ Detect illegal system configurations 	
6	Phone Book Services	Should have the provision for Corporate directory folders, browsing and searching from the endpoint.	
		Should provide automatic directory import from gatekeeper, LDAP, etc.	
		Should have the feature to create, edit, import and export phone books.	
		Should support automatic application of national and international dialing rules	
		Should support automatic identification of ISDN/IP numbers	
		Should support automatic insertion of gateway (GW) prefix, area codes and country codes.	
7	Account Management, Security and Permissions	Should provide audit logging VC Endpoints and MCUs	
		Should have the provision to define and manage user roles.	
		Should support the features of single sign-on authentication of users.	
8	Backup	Should have the capability to perform daily backup of system configuration and settings.	
		Should have the capability to perform restore of configuration and settings from the backup.	
9	Monitoring	<p>The system should have the capability to:</p> <ul style="list-style-type: none"> ➤ Map monitor with graphic display ➤ Customizable background images ➤ Graphical display of call and system status 	

10	Event Notification	<p>The management system should have the capability to provide event notifications like:</p> <ul style="list-style-type: none"> ➤ E-mail notification to individuals or groups ➤ Event logging including boot, link down/up, connect error, call connected/ disconnected, lost response/got response ➤ Upgrade start/finish scheduling, gatekeeper registration, low battery, wrong password alerts 	
11	Call Detail Record & Statistics	<ul style="list-style-type: none"> ➤ The system should provide Call Detail Records from Endpoints, MCUs, Gatekeepers, Gateways, etc. ➤ It should provide graphical display of call detail data ➤ Number of incoming and outgoing calls ➤ Bandwidth usage ➤ Number/address called ➤ Error statistics 	
12	Call Routing	<p>The system should have the capability to provide :</p> <ul style="list-style-type: none"> ➤ Automatic call routing on IP and ISDN ➤ Automatic MCU, gateway and network selection ➤ Support MCU cascading, SIP, H.323, and H.320 	

13	Scheduling and Booking	<p>The management system should provide the capability:</p> <ul style="list-style-type: none"> ➤ To book system and meeting room simultaneously ➤ To book recurring meetings and video resources ➤ To create, password protect, edit or delete booked conferences ➤ Add Web or data conference to meetings ➤ Add / remove participants from reservation or connect/disconnect participants during conferences ➤ Connect conferences ad-hoc or pre-schedule connection ➤ Reserve resources for dial-in participants ➤ Schedule point-to-point conferences or multipoint meetings ➤ Lock conference, preventing new participants from joining ➤ Invite participants by e-mail ➤ Customize meeting names ➤ Over view of scheduled meetings, resources and participants ➤ Real-time over view of meeting status 	
14	Integration with Microsoft Unified Communication	<ul style="list-style-type: none"> ➤ The system should be integrable with Microsoft Exchange Server. ➤ It should provide the ability to schedule conferences, book rooms and invite participants using Microsoft Outlook ➤ Ability to launch ad-hoc and multipoint calls via MS Communicator 	
15	Management of devices	<ul style="list-style-type: none"> ➤ The management software should be accompanied with the hardware of appropriate size ➤ The management application should support 250 device registrations 	
16	Firewall / NAT Traversal	<ul style="list-style-type: none"> ➤ The system should enable conducting of Video Conferences over Public Network for both endpoints and desktop based clients. The Firewall/ NAT traversal system should provide minimum 50 simultaneous concurrent calls. The bidder shall explain and submit a solution document on how this requirement will be met. 	

Gatekeeper:

S.No.	Features/Components	Minimum Required Specifications	Bidder's Response
1	General Feature	Should support min 2,500 clients	
		Should support atleast 200 concurrent point-to-point video sessions	
		Should register H.323 clients over LAN and WAN	
2	Security	Should provide Management via HTTPS, SSH and SCP	
		Should provide SNMP security alerts	
		Should provide Network Settings protection	
		Should provide role based password protected GUI user access	
		Should have the feature to disable root access over Telnet or SSH	
3	Management	Should be manageable via embedded web server, SNMP, Telnet, etc.	
		Should support remote software upload/upgrade via web server, ftp server or ISDN	
		Should have the Embedded setup wizard via a serial port for initial configuration	
		Shall provide diagnostic reports, call detail records, CDR bandwidth usage, type of network and the number of incoming and outgoing calls.	
4	Call Control and Registrations	Should support manual registration of H.323 endpoints and API call control	
		Should support H.225/Q.931, H.245 call control routed mode and non call routed mode	
		Should support registration of H.323 ID, E.164 aliases and services	
5	Zone Control	Should support Remote Zone monitoring and remote Zone redundancy	
		Should support bandwidth management within sub-zone area	
		Should support Registration control (open, specifically allow, specifically deny) of end points	
6	Bandwidth Management	The Gatekeeper should allow bandwidth management on per call basis as well as per quota basis between Video endpoints, between zones created on the Gatekeeper and among zones.	

		Should automatically downspeed the call if it exceeds the allowed bandwidth.	
7	High Availability	Should support high availability feature. Should automatically failover to the redundant gatekeeper in case primary gatekeeper goes down.	
8	Interfaces	Should have min 1 100/1000 Base-TX Ethernet ports	

10.11. Racks:

Common Minimum Specifications For the required racks are as under:

S. No.	Item / Parameter	Specifications	Bidder's Response
1	Rack	Heavy Duty Racks (Rittal /APW President) for housing of MCU, Gatekeeper, server, etc, with power distribution unit, cable manager, cooling fans, front & rear doors. Maximum height of the Rack should not exceed 42U.	
2	KVM Switch with Integrated TFT Monitor	8 Port Digital KVM switch with integrated 17" TFT monitor to connect servers in the Rack to carry out administrative functions of all the connected servers.	

10.12. UPS:

Common Minimum Specifications for UPS required at project sites are as under:

S. No.	Item / Parameter	Specifications	Bidder's Response
1	Make & Model	APC/Emerson/EATON	
2	Rating	2KVA	
3	Technology	On Line	
4	Nominal Input Voltage	230V single phase	
5	Input Voltage Tolerance	170V to 275V	
6	Input Frequency	50 Hz +/- 1 Hz	
7	Nominal Output Voltage	230 V AC +/- 5%	
8	Output Frequency	50 Hz +/- 1 Hz	
9	Output power factor	0.7 or higher	

10	Automatic Voltage Regulation	Required	
11	EMI/RFI Protection	Required	
12	Overall Efficiency	>90%	
13	Overload capability	110% for 5 minutes;	
14	Indicators	LCD Display (on mains, on battery, replace battery, overload, etc), Input & output voltage, frequency, battery voltage	
15	Cold start	Required	
16	Battery Type	Sealed, Maintenance-free	
17	Battery Make	Panasonic / Rocket /CSB	
18	Backup	Min. 30 minutes on full load	
19	Communication Port	RS232C port & necessary communication cables to be provided	
20	Power Management Software	The UPS should have Power Management Software to view & monitor UPS status, backup time, battery status, temperature & shutdown scheduling for Windows XP ,Vista,7 & Red Hat Linux systems.	
21	Certifications	Latest Version of IEC-60950-1 / IS 13252 / UL-60950	
22	Warranty	OEM onsite, labour, parts warranty for the entire lease period.	

10.13. Additional Requirements:

At few sites (4 nos.), IP based high resolution and very high optical zoom camera are required for transmitting live video of site operations to the central management through VC system installed at the site. The structure whose live video is to be transmitted will be typically 2 to 3 Kms away from the VC endpoint at the site. It will not be possible to lay a cable from the structure to the VC endpoint at the construction site as there is high probability of it getting cut. The bidder shall provide a solution based on RF in which feed from the remote camera can be integrated with the VC system and transmitted to the central system at Regional Head Quarters or Corporate Office. The supply and installation of RF system required for transmitting the feed shall also be in the scope of the bidder

Common Minimum Specifications For the Camera shall be as under:

S. No.	Parameter / Feature	Basic Requirement	Bidder's Response
1	Camera	The camera should be PAN/TILT/ZOOM camera	

2	Image Device	The image device should be 1/4 type CCD	
3	Zoom Ratio	Should support min 36x optical zoom	
4	Lens	Should be auto focus zoom lens	
5	Focal Length	Should support focal length ranging from 3.4mm to 122.4 mm	
6	F-number	F1.6 (wide), F4.5 (tele)	
7	Minimum object distance	Should be min 320 mm (wide), 1500 mm (tele)	
8	Pan Angle	Should support 360 degrees	
9	Tilt angle	Should support -90 to 0 degrees	
10	Image size (both MJPEG and H.264)	FULL D1: PAL:720*576, NTSC:720*480 CIF: PAL:352*288,NTSC:352*240 QCIF: PAL:176*144, NTSC:176*120 HALF-D1: PAL:720*288, NTSC:720*240	
11	Compression format	Should support JPEG & H.264 format	
12	Frame Rate	Should support 30fps at D1 resolution (MJPEG & H.264).	
13	Protocols	Should support IPv4/v6 ICMP, ARP, TCP/IP, UDP, RTP/RTCP, RTSP, RTP, SNMP, DHCP, NTP, DNS, DynDNS, HTTP,HTTPS, FTP, SMTP, QOS, SOCKS, uPnP for automatic device discovery	
14	Network Interfaces	Should have min 1 10Base-T/100Base-TX port for LAN Connectivity, 1 RS-232, RS-485	
15	I/O ports	Should have min 2 ports for Sensor in, 2 for Alarm out	
16	Signal system	Should support NTSC & PAL Signal System	
17	Horizontal resolution	Should support min 540 TV lines	
18	S/N ratio	Should be min 50dB	
19	Min. illumination	Color: 0.40Lux,1/60 sec, 0.1Lux,1/4 sec B/W: 0.003Lux, 1/4 sec IR	
20	System Management	Should be able to manage the system through GUI & support common alarm management system like motion detection, video lost and alarm\triggers by external device connected on Sensor IN ports.	
21		Should support access rights and privileges for user from administrator to simple guest.	
22	Support for Video Management System	The camera must support software for Video Management System. This will enable remote viewing, recording, centralized streaming server to support multiple clients. The software must also provide support for intelligent video analytics.	

Common Minimum Specifications for the RF System shall be as under:

Point-to-Point and Point to Multi-Point: The solution should be a set of two units, one point-to-point (PTP) and another multipoint (MP). The PTP system will be installed at far structures or masts in the field near the camera and the multipoint system shall be installed at the site office building. The multipoint system should be able to communicate to at least 5 other PTP systems simultaneously.

The PTP systems shall have a bandwidth of minimum 10Mbps whereas that of the MP shall be 20Mbps.

The systems shall be rugged weather proof outdoor systems.

The systems shall have Ethernet interfaces to connect to router and switch on IP.

The LOS range of the systems shall be at least 5 Kms.

The systems shall be able to carry audio, video and data traffic.

The solution shall come with necessary software and hardware for multiple stream management and other configuration and monitoring purpose.

All necessary statutory clearances or licenses for frequency usage shall be in the scope of the bidder.

The RF system should be supplied with 100m cable to connect to the IP Camera and another 100m cable to connect to the LAN.

All necessary other data and power cables should be provided by the bidder.

11. List of Annexures:

- 11.1.** Annexure-I: Format for Back-to-Back Support.
- 11.2.** Annexure-II: Proforma for Integrity Pact.
- 11.3.** Annexure-III: Proforma for Non Disclosure Agreement.
- 11.4.** Annexure-IV: Format for OEM Authorization.
- 11.5.** Annexure-V: Format for No-Deviation Certificate.
- 11.6.** Annexure-VI: Checklist of Make & Models Offered
- 11.7.** Annexure-VII: Price Bid Format.
- 11.8.** Annexure-VIII: List of Locations in Phase-I.
- 11.9.** Annexure-IX: List of Total Locations.
- 11.10.** Annexure-X: Existing VC Setup.
- 11.11.** Annexure-XI: Existing OCS Setup