

**MODERNIZATION / UPGRADATION OF AUDIO-VIDEO SYSTEMS OF CONVENTION
HALL (AUDITORIUM AT BHEL-HARIDWAR)**

GENERAL INSTRUCTIONS

The system is required for the renovation of **Audio** and **Film projection** setup at "**Convention Centre-BHEL Hardwar**":

Seating capacity = 1470 (Ground (970)+Balcony(500))

Screen = 54' x 27' (Effective image size) - Must be covered by projection.

Auditorium Walls = acoustically designed/ treated are existing.

Use = Stage Lectures, Seminars, cultural functions etc, and for films screening

Layout = Drawing of auditorium is furnished in the tender documents.

SALIENT POINTS :

- 1- Projector (viz. only Projector and it's accessories (eg. Player), no other eqpt) located at rear projection room..
- 2- Sound Control adjacent to stage (side) - for all stage events
- 3- Sound & Film Control from Projector room (rear) only.
- 4- All eqpt (viz. Amp's, Mixers etc) to be in 2 nos portable trolley cabinet with lock and wheels.
- 5- Suitable Speakers networks needed - separate for Stage Prog's and Film.
- 6- Live (Audio) Recording Facility req'd. (For Stage events).

INSPECTION - ACCEPTANCE CRITERIA :

REPORT TO BE SUBMITTED AFTER INSTALLATION.

1. Speech Transmission Index (STI/RaSTI) Analysis will be required using CAD mapping of auditorium—showing coverage of sound in entire auditorium.
2. STI (Speech Transmission Index) Spectrogram graph considering noise level of 55 dB.
3. SPL uniform (Sound Pressure Level) Spectrogram @ +/- 3 dB at 95 dB. of sound in entire auditorium.
4. D/R (direct filled and reverb filled) Ratio coverage Map —showing coverage of sound in entire auditorium.

NOTES:

1. Technical bids to be supported with detailed **OEM's catalog** for **each item**, clearly showing adherence of parameters as per BHEL's specs, without which the bid will be rejected. If not submitted for any single item, the bid may be rejected.
2. All items will be procured from a **single vendor** only. L1 will be decided on basis of the complete package cost only.
3. For the cabling work – like Microphone cable, speaker cable, VGA cable and snake cable etc, no deviation in the quantity taken in BOQ will be allowed. No payment will be made for excess quantity from BOQ.
4. All speakers mounting, wiring, conduiting etc.to be included in scope. Sub-woofers to be enclosed in aesthetic wooden frame/s.
5. No deviation in specs from BHEL's spec's will be allowed, however, vendor can offer model/s having specs better than mentioned in BHEL's tender (conforming with the specified brands only) but without any additional financial implication, and evaluation of offers shall be done on basis of minimum requirement given in the scope.

MODERNIZATION / UPGRADATION OF AUDIO-VIDEO SYSTEMS OF CONVENTION HALL (AUDITORIUM AT BHEL-HARIDWAR) - cont'd

6. **Payment Terms:** 60% on Delivery, 40% after successful Interfacing and Demo of complete working of the system.
7. Warranty to be furnished -for a period of 12 months OR warranty period given by the OEM, whichever is higher, from date of successful Interfacing and Demo of complete working of the system. Any replacement /repair within this period will be free of cost.
8. The bidder must be able to attend any complaints within 24 hours of complaint.
9. Free Operational Training to BHEL personnel for the entire system to be provided on site.
10. Free Product Training to BHEL personnel for upto four BHEL personnel for upto 3-4 days to be provided at OEM/Channel partner premises.
11. AMC charges to be quoted – valid for 5 years from end of Warranty. However, this will not be used for evaluation of main tender.
12. Rates shall be quoted in figures and words and vendor must put his name and sign on each page of tender documents, mentioning compliance to all points therein, failing of which tender may be liable for rejection.

=====

SPECIFICATION FOR MODERNIZATION / UPGRADATION OF AUDIO-VIDEO SYSTEMS OF CONVENTION HALL (AUDITORIUM AT BHEL-HARIDWAR)

PRE-QUALIFICATION CRITERIA

Initial Screening

The Bidder should have past experience in implementing similar work. The OEM and Authorized Integrator must possess the requisite experience, organizational strength and capabilities in providing the services necessary to meet the requirements as described in the document. Keeping in view the complexity & volume of the work involved, the following criteria are prescribed as pre-qualification criteria for bidder interested in undertaking the project. The OEM and Authorized Integrator must possess the technical knowhow and the financial strength that would be required for successful implementation of the project and support services sought by Department for the entire period of the contract.

For this purpose bidder should qualify the following Eligibility Criteria:

1. The Bidder should be reputed OEM of Sound Reinforcement Systems components like Speakers, Power Amplifiers, Audio processor, Wireless Microphones, Mixers, Corded Microphones, Video Projector, etc having well established infrastructure in India with their own sales and service center in India or their such Authorized System Integrator duly authorized by the OEM for the exclusive purpose of participation in this tender. Proof of being manufacturer for each individual of the following items below to be submitted with Technical bid.
 - a. Speakers
 - b. Amplifiers
 - c. Audio Processor
 - d. Wireless Microphone
 - e. Mixer
 - f. Corded Microphones
 - g. Video Projector

2. If the bidder is not an OEM for each of the items listed below, then the Bidders should have specific Authorization from OEM of
 - a. Speakers
 - b. Amplifiers
 - c. Audio Processor
 - d. Wireless Microphone
 - e. Mixer
 - f. Corded Microphones
 - g. Video Projectorfor exclusive purpose of Participation in this tender. Proof for each individual items mentioned above to be submitted with Technical bid.

3. Based upon the auditorium's detailed drawing furnished along-with the tender, the bidder shall submit 3D Mapping design of his offered Auditorium Sound Systems using generic Electro-Acoustic simulation software – containing :
 - a.) Speech Transmission Index(STI/RaSTI) Analysis using CAD Mapping of the room.
 - b.) Articulation Loss.
 - c.) Total SPL Spectrogram....dB (+-3 dB)
 - d.) Loudspeaker Overlap coverage pattern
 - e.) D/R (direct field and reverb field) Ratioto confirm the technical performance of the systems proposed.
This report shall be on OEM/bidder's letterhead and shall be submitted in technical BID.
4. The bidder must have executed **minimum one work of Audio and Video Projection System in Auditorium in last 3 years**. Proof (PO/WO + Work Completion Cert) to be submitted with Technical bid.
5. If the intending bidder is Authorized System Integrator then he shall submit **undertaking from the Manufacturer in original to ensure that they will provide required technical as well as sales & service support for warranty and subsequent annual maintenance period of 4 year**.
6. The bidder should furnish Commercial Tax (**CST / VAT**) **Registration Certificate** and **Permanent Account Number (PAN)** along with last **three years IT returns** filed **duly attested** shall be to be submitted with Technical bid.
7. **Tenderer should submit copy of audited balance sheet, for last 03 years.**

TECHNICAL BID

SPECIFICATION FOR MODERNIZATION / UPGRADATION OF AUDIO-VIDEO SYSTEMS OF CONVENTION HALL (AUDITORIUM AT BHEL-HARIDWAR)					TOTAL =36 Items
S.No.	PARTICULARS	Approved Makes	QTY.	MAKE and MODEL Quoted	Brochure/ Catalog Attached
				To be filled by Vendor	Vendor must TICK
1	LINE ARRAY SPEAKER SYSTEM : 12" two-way line-array system with 1 LF. 3 Annular Ring Diaphragm HF on Constant Curvature waveguide. Frequency range: 57 Hz-20 kHz. SPL: 95 dB/130 db max. Power output :800 watts continous. Nominal dispersion :100 degree x 15 degree. Passive or bi-amplified operation.	JBL / L Acuostics / Renkus Heinz / Bose	9 Nos.		Yes / No
2	ARRAY FRAME : Supply of frame for the suspension of Line Array Speakers from the Ceiling.	JBL / L Acuostics / Renkus Heinz / Bose	3 Nos.		Yes / No
3	SUBWOOFER SPEAKER SYSTEM : 18" Portable base reflex Subwoofer System, Power Capacity. : 800 watt Continuous. SPL : 31Hz -220 Hz; 95 dB .	JBL / L Acuostics / Renkus Heinz / Bose	2 Nos.		Yes / No
4	STAGE MONITOR SPEAKER SYSTEM : 12" Two-way Portable Monitor or Front of House Speaker System. Power Capacity : 400 watt Continuous. 12" Differential Drive Woofer and a 1.5 " Annular Polymer Diaphragm Compression Driver. Frequency response : 60Hz-20kHz. SPL: 94 dB. Dispersion (Coverage) : 70° x 70° .	JBL / L Acuostics / Renkus Heinz / Bose	4 Nos.		Yes / No
5	SURROUND SPEAKER SYSTEM : 8" Low frequency drivers and 1" High frequency. Power output : 150W RMS. Coverage angle: 100° x 90°. Crossover frequency: 3Khz.	JBL / L Acuostics / Renkus Heinz / Bose	20 Nos.		Yes / No
6	MONITOR SPEAKER SYSTEM : Powered monitor speaker system. One powered master and one passive extention speaker. Balanced and unbalanced input connectors. Power output : 35 watts.	JBL / L Acuostics / Renkus Heinz / Bose	1 Pair		Yes / No

7	AMPLIFICATION FOR LINE ARRAY SPEAKER SYSTEM : Dual Channel Digital Power Amplifier. Power rating : 3000 W@ 2 ohm, 2100W @ 4 ohm, 1200 W @ 8 ohm per channel. LCD Screen with speaker presets for crossover frequencies, EQ, Limiting and delay.	Crown / Bose / Lap Gruppen / L Acuostics	3 Nos.		Yes / No
8	AMPLIFICATION FOR SUBWOOFER SPEAKER SYSTEM : Dual Channel Digital Power Amplifier. Power rating : 1600 W@ 2 ohm, 1200W @ 4 ohm, 650 W @ 8 ohm per channel. LCD Screen with speaker presets for crossover frequencies, EQ, Limiting and delay.	Crown / Bose / Lap Gruppen / L Acuostics	1 Nos.		Yes / No
9	AMPLIFICATION FOR STAGE MONITOR SPEAKER SYSTEM : Supply of Dual Channel Digital Power Amplifier. Power rating : 1000 W@ 2 ohm, 800W @ 4 ohm, 475 W@ 8 ohm per channel. LCD Screen with speaker presets for crossover frequencies, EQ, Limiting and delay.	Crown / Bose / Lap Gruppen / L Acuostics	2 Nos.		Yes / No
10	AMPLIFICATION FOR SURROUND SPEAKER SYSTEM: Dual Channel Digital Power Amplifier. Power rating : 1450 W@ 2 ohm, 1200W @ 4 ohm, 650 W@ 8 ohm per channel. LCD Screen, onboard digital signal processing including crossover, EQ filters, delay and output limiting.	Crown / Bose / Lap Gruppen / L Acuostics	3 Nos.		Yes / No
11	DIGITAL SIGNAL PROCESSOR : 12 analog mic/line input. 8 analog output. Networked signal processor with fault-tolerant bus.	BSS / DBX / Symetrix / Extron	1 No.		Yes / No
12	GRAPHIC EQUALIZER : Dual 31 Band Graphic Equalizer with Constant Q bands. 4 Sedment LED Ladder. Switchable bass/cut range : +/-6dB or +/-12dB . Input gain +/- 12dB.	BSS / DBX / Symetrix / Extron	1 No.		Yes / No
13	MIXING CONSOLE : Multipurpose Rack Mountable 16 mono Channels . 4 stereo Channels inputs,2Groups, Direct Outs: All mono Channels. EQ Bands mono inputs: 3(swept mid). Filters: 100Hz HPF mono inputs, Auxiliary Sends- 3+ FX. Returns:5 stereo returns. Phantom Power.	Soundcraft / Allen & Heath / Midas	2 No.		Yes / No

14	<p>WIRELESS HANDHELD MICROPHONE : Wireless handheld microphone with a true diversity receiver. Noise reduction system : sennheiser HDX RECEIVER-: AF frequency response : 25 -18000 Hz . S/N ratio >110 dB Switching bandwidth : 42 MHz. Total 1680 frequencies accessible in 25 KHz steps. Automatic frequency scanning function that utilizes 20 banks of pre coordinated frequencies. User bank in order to store user defined frequencies. Antenna inputs : 2 BNC inputs . Receiver is equipped with backlit display that displays AF and RF levels, diversity switching information . 1 balanced XLR output with a max output of +18 dBu, and 1 unbalanced 1/4" with a max output of +12 dbu. TRANSMITTER-: Type handheld . RF power output at 50Ω : 30 mW. AF frequency response : 80-18000Hz. Power supply : 2AA batteries.</p>	Sennheiser/ AKG / Shure	4 Nos.		Yes / No
15	<p>WIRELESS COLLAR MICROPHONE : Wireless handheld microphone with a true diversity receiver. Noise reduction system : sennheiser HDX RECEIVER-: AF frequency response : 25 -18000 Hz . S/N ratio >110 dB Switching bandwidth : 42 MHz. Total 1680 frequencies accessible in 25 KHz steps. Automatic frequency scanning function that utilizes 20 banks of pre coordinated frequencies. User bank in order to store user defined frequencies. Antenna inputs : 2 BNC inputs . Receiver is equipped with backlit display that displays AF and RF levels, diversity switching information . 1 balanced XLR output with a max output of +18 dBu, and 1 unbalanced 1/4" with a max output of +12 dbu. TRANSMITTER-: Type Collar . RF power output at 50Ω : 30 mW. AF frequency response : 80 -18000Hz. Power supply : 2AA batteries, 1.5 v. Input impedance transmitter / line : 40 kΩ. Mic Transducer principle : condenser</p>	Sennheiser/ AKG / Shure	6 Nos.		Yes / No

16	<p>ACTIVE ANTENNA SPLITTER : Antenna splitter for the loss free operation of multi channel G3 wireless systems. Up to four diversity receivers may be supplied with signal by only two antennas. The integral RF amplifiers ensure that the ASA 1 does not introduce any additional UHF signal loss. Impedance: 50 Ω. Frequency range 500 to 870 MHz at -3 dB</p>	Sennheiser/ AKG / Shure	3 Nos.		Yes / No
17	<p>PASSIVE DIRECTIONAL ANTENNA : Supply of Transmitting and receiving antenna. Frequency range : 450-960 MHz Apex angle: approx 100° Front-to-back ratio ≥ 14 dB Gain approx: 10 dB</p>	Sennheiser/ AKG / Shure	2 Nos.		Yes / No
18	<p>VOCAL MICROPHONE : Professional dynamic Corded microphone for lead & backing vocals on stage. Polar Pattern : Cardioid. Frequency Response: 40-16000 Hz Nominal Impedance: 350 Ohms</p>	Sennheiser/ AKG / Shure	4 Nos.		Yes / No
19	<p>INSTRUMENTAL MICROPHONE : Dynamic instrument Corded microphone designed for drums and percussions. For wind instruments and guitar amps. Pick up Pattern: Cardioid Frequency Response: 80-15000 Hz Nominal Impedance: 350 Ohms</p>	Sennheiser/ AKG / Shure	6 Nos.		Yes / No
20	<p>GOOSENECK MICROPHONE WITH SHOCK MOUNT/BASE: 21" Gooseneck microphone with sleek and unobtrusive design, with high sensitivity for superior vocal reproduction, high gain before feedback, builtin XLR socket, supplied with Microphone base with On/Off switch & LED or Shock Mount. Anti Mobile & RF Interface Technology. Polar Pattern: Cardioid , Sensitivity: -40bBV/Pa Frequency Response: 20Hz-20Khz, Output Impedance: 280 Ohms SPL: 140dB. Connector XLR</p>	Sennheiser/ AKG / Shure /StuDiomaster	10 Nos.		Yes / No

21	BOUNDARY LAYER MICROPHONE : Extreme rugged. Studio quality boundary layer microphone with 3-pin XLR Phantom power adapter. Polar Pattern: Supercardioid Frequency Range: 50 - 18000 Hz Max SPL: 120 dB Signal To Noise Ratio: 72 dB Impedance: 150 ohms Sensitivity: 22 mV/Pa	Sennheiser/ Crown / Shure /Beyerdynamic	4 Nos.		Yes / No
22	AUDIO AND VIDEO PLAYER : Blu Ray + DVD +CD + MP3 + USB(for Aud & Vid). O/P= Vid= HDMI, AV, S-Vid, Comp-Vid etc ; O/P= Aud= 5.1 etc	Onkyo/ Denon/ Panasonic/ Sony	3 Nos.		Yes / No
23	HARD DISK DVD RECORDER : DVD recorder with 320 GB Hardisk with monitor.Internal HDMI Output with 1080p Upconversion. Dolby Digital and DTS Decoding. DV Input. Simultaneous Recording/Playback. Hi-Speed Dubbing. Records: DVD-R/W and DVD-RAM. PAL/SECAM TV Tuners.	Onkyo/Denon/ Panasonic	1 No.		Yes / No
24	MICROPHONE SNAKE CABLE : 16 Channel Microphone Snake Cable.	Falcon/Klotz / Beldon	300 Mtrs		Yes / No
25	MICROPHONE CABLE : 2 core 0.22 sqmm shielded microphone cable.	Falcon/Klotz / Beldon	400 Mtrs		Yes / No
26	LOUDSPEAKER CABLE : 2 core 2.25 sqmm loudspeaker cable.	Falcon/Klotz / Beldon	300 Mtrs		Yes / No
27	ANTENNA CABLE : Antenna Cable for passive directional antenna.	Falcon/Klotz / Beldon	50 Mtrs		Yes / No
28	MICROPHONE CONNECTOR BOXES : Microphone Connector boxes for stage with chasis mount connectors for microphone and Aux. connectivity.	Falcon/Klotz / Beldon/ Custom	9 Nos.		Yes / No
29	CONNECTORS & PATCH CABLES : UL Listed Audio & video Connectors and Patch cables for entire system set-up.	MX/Neutrik/ Beldon	1 Set.		Yes / No
30	EQUIPMENT RACK : Equipment Rack to accomodate all rack mount equipment. With Fan, drawer, Power Strip, door, heavy wheels and locking facility.	Hari Engg/Coral/ Custom	2 Nos.		Yes / No

31	LCD PROJECTOR : Supply of LCD WXGA Projector 6500 ANSI Lumens. Native Resolution 1366 x 800 Brightness : 6500 ANSI Lumens. Contrast : 2500:1 . 10 bit Digital Signal Processor Input signals: RGB input:-VGA, SVGA, XGA, WXGA, SXGA, SXGA+, UXGA. Video inputs:- NTSC, PAL, SECAM, M-PAL, N-PALS Input/output terminals-S-video, Composite Video, Component Video, Analog RGB:15 pin, HDMI x1, 15-pin Mini-Dsub x1, Stereo mini jack x 1, Serial port in x 1, out x 1 for RS232C, RJ-45 x 1. Motorized zoom, focus and lens shift. Mechanical light shutter. Auto Vertical Keystone correction.	Hitachi / Christie / Barco	1 No.		Yes / No
32	PROJECTOR LENS : Supply of Standard Projection lens 1:2.2 - 2.9 zoom	Hitachi / Christie / Barco	1 No.		Yes / No
33	PROJECTOR PROTECTIVE CAGE: Durable and strong S/S mounting kit for projector .	Customised	1 No.		Yes / No
34	ONLINE UPS : ONLINE UPS 5 KVA. Back up : 20 minutes. Make : NEOPOWER , SUKAM ,MICROTEK	NeoPower/ Sucam/ Microtek	1 No.		Yes / No
35	MICROPHONE STANDS: Microphone stand with boom. Loaded nylon tripod base. Height : 202 cm. Spread : 64 cm. Make : BESPCO , K&M	Bespco, K&M/Ahuja	6 Nos.		Yes / No
36	TABLE MICROPHONE STANDS : Table/floor stand. Height : 350-530mm. Base dia : 150mm . Make : AHUJA , GS.	Bespco, K&M/Ahuja	6 Nos.		Yes / No

(Sign. and Stamp of the Vendor)

**FINANCIAL BID FOR MODERNIZATION / UPGRADATION OF AUDIO/VIDEO SYSTEMS OF
CONVENTION HALL (AUDITORIUM AT BHEL-HARIDWAR)**

S.No.	DESCRIPTION OF ITEM	QTY	MAKE & MODEL QUOTED	RATE IN FIGUREs	AMOUNT IN FIGUREs
1	LINE ARRAY SPEAKER SYSTEM	9 Nos.			
2	ARRAY FRAME	3 Nos.			
3	SUBWOOFER SPEAKER SYSTEM	2 Nos.			
4	STAGE MONITOR SPEAKER SYSTEM	4 Nos.			
5	SURROUND SPEAKER SYSTEM	20 Nos.			
6	MONITOR SPEAKER SYSTEM	1 Pair			
7	AMPLIFICATION FOR LINE ARRAY SPEAKER SYSTEM	3 Nos.			
8	AMPLIFICATION FOR SUBWOOFER SPEAKER SYSTEM	1 Nos.			
9	AMPLIFICATION FOR STAGE MONITOR SPEAKER SYSTEM	2 Nos.			
10	AMPLIFICATION FOR SURROUND SPEAKER SYSTEM	3 Nos.			
11	DIGITAL SIGNAL PROCESSOR	1 No.			
12	GRAPHIC EQUALIZER	1 No.			
13	MIXING CONSOLE	2 No.			
14	WIRELESS HANDHELD MICROPHONE	4 Nos.			
15	WIRELESS COLAR MICROPHONE	6 Nos.			
16	ACTIVE ANTENNA SPILTTER	3 Nos.			
17	PASSIVE DIRECTIONAL ANTENNA	2 Nos.			
18	VOCAL MICROPHONE	4 Nos.			
19	INSTRUMENTAL MICROPHONE	6 Nos.			
20	GOOSENECK MICROPHONE WITH SHOCK MOUNT/BASE	10 Nos.			
21	BOUNDARY LAYER MICROPHONE	4 Nos.			
22	AUDIO AND VIDEO PLAYER	3 Nos.			

23	HARD DISK DVD RECORDER	1 No.			
24	MICROPHONE SNAKE CABLE	300 Mtrs			
25	SITC OF MICROPHONE CABLE	400 Mtrs			
26	LOUDSPEAKER CABLE	300 Mtrs			
27	ANTENNA CABLE	50 Mtrs			
28	MICROPHONE CONNECTOR BOXES	9 Nos.			
29	CONNECTORS AND PATCH CABLES	1 Set			
30	EQUIPMENT RACK	2 Nos.			
31	LCD PROJECTOR	1 No.			
32	PROJECTOR LENS	1 No.			
33	PROJECTOR PROTECTIVE CAGE	1 No.			
34	ONLINE UPS	1 No.			
35	MICROPHONE STANDS	6 Nos.			
36	TABLE MICROPHONE STANDS	6 Nos.			

TOTAL VALUE in Figures (INCLUSIVE OF ALL TAXES, VAT etc) =

TOTAL VALUE in words (INCLUSIVE OF ALL TAXES, VAT etc) =

Rate chargeable for AMC wef. Expiry of 1 year Warranty period, VALID for at least 5 years. However the AMC charges mentioned below will not be considered for evaluation of bid and award of tender for the above work.

AMC (COMPREHENSIVE) CHARGES:

Year 1 after expiry of Warranty	Rs . _____ p.a + Service Tax
Year 2 after expiry of Warranty	Rs . _____ p.a + Service Tax
Year 3 after expiry of Warranty	Rs . _____ p.a + Service Tax
Year 4 after expiry of Warranty	Rs . _____ p.a + Service Tax
Year 5 after expiry of Warranty	Rs . _____ p.a + Service Tax

(Sign. and Stamp of the Vendor)

