



सत्यम् शिवम् सुन्दरम्

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New Delhi - 110 001

**File No. 19(2)2018-19E1 (P) TV**

**Dated: 14.05.2019**

**Subject:** Draft Technical Specification for SITC of Multi-Camera Mobile Production facility (EFP Van).

The Draft specification of the upcoming tenders is enclosed herewith to offer comments, if any by due date at e-mail address [ddpurchase401@yahoo.co.in](mailto:ddpurchase401@yahoo.co.in) or on following Address:


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Specification For: Draft Technical Specification for SITC of Multi-Camera Mobile Production facility (EFP Van).

Specification no: SD 05/2019 Dated: 09.05.2019

Due Date to offer Comments: 28.05.2019

Encl.: As above (33 Pages)

  
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For DG: DD

PRASAR BHARATI  
(INDIA'S PUBLIC SERVICE BROADCASTER)  
DIRECTORATE GENERAL: DOORDARSHAN

**Technical Specifications for  
SITC of Multi-Camera Mobile Production Facility (EFP Van)**

Specifications No.: SD 05/2019

Dated: 09.05.2019

**1. Scope:**

The specifications aim at Supply, Installation, Testing and Commissioning (SITC) of multi-camera Mobile Production Facility (EFP Van) in High Definition (HDTV) format for Doordarshan network. The EFP Van will be used as Programme Production Facility for a wide variety of Indoor as well as Outdoor events, anywhere in India. The EFP Van should be supplied with 4 HD cameras & wired for 6 HD camera setup.

**2. Essential Eligibility Criteria:**

- a) Each and every offered equipment should be from internationally reputed manufacturer and the quoted model should be field proven and in use by leading broadcasters in various continents of the World.
- b) The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied. **Bid without product specific broadcaster user list is liable to be rejected.**
- c) **The bidder shall submit only one solution (Single BOM) for the offered system. Bid with alternate item(s) and/or multiple options (BOMs) is liable to be rejected.**
- d) The bidder should have a proven track record of design, fabrication and installation of multi-camera HDTV EFP/OB Van and should have work experience of at least two such projects in the **last seven years** prior to the submission of the bid. The cutoff date for the experience shall be the date of submission of the bid. The bidder not having work experience may tie up with other partner with requisite work experience as mentioned above. In this case, the partner will be responsible for carrying out design, fabrication, installation, testing & commissioning of the facility. The Memorandum of Understanding (MOU) of partnership to this effect should be submitted along with the bid. However, this MOU does not absolve the bidder from successful completion of the SITC job as per the terms and conditions of the tender. The list of such turnkey works successfully done by the bidder/partner in the past 7 years having full details should be enclosed along with the bid. The supporting documentary evidence like work order with successful completion certificate should also be submitted along with the bid. The offer from the



bidder not having work experience of two such projects in the past 7 years prior to submission of the bid will not be considered.

- e) A pre bid conference will be held at an appropriate time before the last date of the submission of the bid to bring clarity to all the prospective bidders in respect of the requirement of tender specifications. The date and venue will be intimated to all the prospective bidders. The prospective bidders must submit their queries (if any) in writing so as to reach Doordarshan at least three working days before the pre-bid conference.

### **3. Turnkey Implementation and Commissioning:**

- a) The complete project consists of Supply, Installation, Testing and Commissioning (SITC) of the EFP van. The project will be carried out on turnkey basis.
- b) It will be the responsibility of the bidder to ensure after-sale service and guarantee for the equipment from various manufacturers. In case of the firms that are dealing with the turnkey implementation of the project only, they can be considered only if the manufacturer(s) of different major equipment such as Camera chains, Production Switcher, Servers, Audio Mixer, Character Generator, Intercom system, UPS etc. extend and ensure all Guarantee with respect to their equipment to the bidder and in turn to the procurement authority i.e., Doordarshan.
- c) The Bidder will be required to use only high quality HD video/audio cables, connectors and other accessories. The HD video cable should be similar to Belden 1855 for rack wiring and Belden 1505 & 1694A for other applications. The HD BNC connectors of high quality suitable for these video cables similar to Neutrik should be used. XLR connectors should be of high quality and similar to Neutrik.
- d) The Bidder should use video/audio cables of different colors for ease of identification. Identification tags on both ends of the connected video cables should be provided for ease of identification.
- e) The offered audio and video racks should be equipped with professional grade MDUs for powering various equipment. The rack should also have cooling fans etc.
- f) The system integrator should display in vantage positions in the EFP Van the Technical Block and Line diagrams of the Video, Audio and Power chain.
- g) The essential input and output routing of video signals to and from the production switchers and routing switcher will be through sufficient number of HD video patch panels. Only high quality digital patch panels which support high bandwidth should be offered. The patch panels should be normal through with 75 ohm termination.



- h) The number of inputs, outputs and performance parameters mentioned in the specifications for various equipment required for the EFP van are suggestive and minimum only. The bidder can offer better parameters and more I/Os.
- i) The EFP Van should be capable of working properly in the tropical/sub-tropical conditions where ambient temperature may vary from subzero to 50° Celsius.
- j) It is mandatory for the bidder to submit the **BIS certificates** wherever applicable, along with the bid for the products quoted in this tender.

#### 4. Vehicle & its Customization:

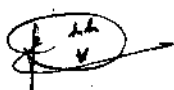
- a) The Vehicle for the EFP Van must stand up to the demanding traffic and road conditions in India.
- b) The EFP Van should be built on chassis not exceeding overall vehicle length of not less than **26 feet** approx. (from front registration number plate to rear registration number plate) on a cab chassis. Vehicle from reputed manufactures in the field of automobiles such as Tata Motors, Ashok Leyland or similar manufacturer having pan India service support will only be acceptable.
- c) The vehicle should be equipped with suitable capacity diesel engine (**GVW 16 tons approx**) with enough head room and should compliant to BS-IV emission norms. The vehicle will be deployed pan India from Hilly terrain of the Himalayas to desert of Rajasthan, to plains of Central India, to marshy lands of Gujarat and West Bengal.
- d) The EFP Van should be equipped with equipment bays for Production, Recording, CCU, and Monitoring Equipment with an ease of access while servicing.
- e) The EFP Van should be provided with ergonomically & aesthetically designed Production, CCU, Audio, Recording, End Control Desks, Video Monitoring walls etc.
- f) Technical Furniture including Operator chairs etc. will also be part of the offer.
- g) The EFP Van should be provided with suitable storage spaces for Cameras, Lens, Tripod, various Cable drums and miscellaneous equipment etc.
- h) The EFP Van should have hydraulic stabilization jacks.
- i) The EFP Van should be equipped with vehicle reversing set including proximity sensors, rear view camera(s) along with LCD screen(s) in driver cabin.
- j) Portable Fire Fighting Extinguishers of suitable type in each partition should also be provided.



- k) Provision of First Aid Kit is also required to be made in the offer.
- l) The vehicle should have suitable suspension system both for rear and front to absorb any jerks and shocks while on movement.
- m) The interior and exterior of the EFP van should be ergonomically & aesthetically designed to meet the physical and environmental conditions as well as comfortable working for personnel.
- n) The chassis of the van should have load-bearing capacity to withstand the weight of all the Video & Audio equipment, A/C units, Various Cable Drums, Camera Stands, Packaging Boxes, UPS, Power Distribution Panels, Furniture, Equipment Racks, Personnel, and the weight of the Van Body itself.
- o) The chassis size of the van should be such that all the Production, Recording, Monitoring, Air Conditioning, Power Supply Equipment, Various Equipment Racks, Technical and Operational Furniture and their storage etc. be accommodated easily without any hindrance to operational staff in the Van.
- p) All storage compartments provided in the external body of the EFP van should be properly illuminated.
- q) Binding straps/belts should be provided for holding the equipment in position while the vehicle is on move.
- r) Since the Vehicle has to carry a large number of sophisticated and costly equipment, utmost care should be taken while selecting the chassis and designing the body of the van. Therefore, vehicle customization shall include all aspects including Structural Analysis, System Design, Coach Building, proper heat insulation, Equipment Installation, Field Testing etc.
- s) Adequate care should be taken in the EFP Van design for proper working of the Van in the tropical/sub-tropical conditions where ambient temperature may vary from subzero to 50° Celsius.
- t) The vehicle should be customized by applying leading edge technology in accordance with the international quality standards using corrosive resistant high grade raw material. The vehicle body structure should be of a hybrid type with a combination of Premium quality Phosphated MS Tubes (load bearing members) and Premium Quality Aluminum Alloy material 6063 material (sheet of minimum 3 mm thickness) to ensure structural ruggedness with anti-corrosiveness.
- u) Latest technology materials should be used for heat and noise insulation of the walls, ceiling, doors and floor operational areas. All the materials should be fire retardant. PUF sheet of minimum 40 mm thickness for heat insulation should be used.
- v) All body joints are to be sealed with premium quality sealant and all Aluminum joints to be done with Metal Inert Gas (MIG) welding.



- w) Due process for painting the vehicle's outer body like Mechanical sanding, 2K Aluminum Primer coating, Final top coating has to be strictly followed. Under body anti-rust coating should also be essentially carried out for the EFP van.
- x) **Shock absorbers should be provided on the mounting of equipment wherever necessary so as to avoid them from being damaged during the vehicle movement.**
- y) Body size including height of the van should conform to local Transport Authority regulations. The successful bidder is required to complete the formalities of registration of vehicle with the appropriate transport authority. The EFP vans are being procured for Doordarshan kendras as mentioned in Appendix-III and will be registered in the name of these kendras.
- z) All necessary certifications which are required from different Central/State Government & Regulatory Authorities shall be obtained and provided by the successful bidder. The Initial charges towards Registration, Permit, Insurance, Road Tax etc. will be part of the offer.
- aa) The system shall be designed to allow rapid transportation in the Indian environment, quick and easy deployment, lower running cost and easy serviceability.
- bb) **The van should have equipment as given in the Appendix-II and as defined elsewhere in the specifications.** All the equipment envisaged should be accommodated inside the van leaving sufficient working space for production/ operational crew.
- cc) The installed equipment should have quick access to front and back panels for ease of maintenance.
- dd) Layout drawing of the Equipments, Racks, Production Desks, Air Conditioning, Power Supply, Video and Audio Schematic etc. are of prime concern and are to be submitted by bidders along with the bid. The successful bidder will be required to prepare and submit multiple options for layout & design of the van and its equipment and will get the final layout & design approved by the Director General of Doordarshan immediately after getting the supply order. The layout & facility design and selection of equipment should be done keeping in view the broadcast quality production and professional workflow requirements for HDTV production and requirements as described in these specifications.
- ee) The layout should be so designed as to maximize the utilization of the available space without compromising with the functional requirement.
- ff) The production areas should have sufficient seating for required number of operational and production staff. The operational crew's seating should have easy-to-reach controls in the panel.



- gg) Retractable Awnings on both the main doors & back doors of the Van may be provided which can be unfolded while working in sunny & rainy climate conditions.
- hh) Part of the roof of the vehicle is to be made strong enough for camera mounting and antenna for microwave link in future.
- ii) Fold down hand rails on the roof and ladder should also be provided with the EFP Van.
- jj) **Rear Connection and Stowage Area of the EFP Van should have the provision for the following:**
  - i. At least 6 motorized cable drums for long length OFC cables,
  - ii. Under floor storage boxes with side access should be provided
  - iii. Multi pair audio, video and monitor cables in suitable size of Cable drums.
  - iv. 125 meters length of flexible mains 3 ½ core copper cables of 10 sq.mm (approx.) size.
  - v. External termination panels for multiple nos. of inputs & outputs connections of Video for PGM, Clean Feed, Aux. etc. in HD-SDI, SD-SDI and Composite, Communications and Power Supply with proper designation marking on each connector.
  - vi. The following video in/out should be terminated at the tail board:
    - a. PGM (HD – 4 Nos., SD – 4 Nos.), AUX out – 2 Nos., Router out – 2 Nos. Router Input – 4 Nos.
  - vii. External termination panels for multiple nos. of inputs & output connections of Audio in Analog and AES/EBU for Mic., Line, Aux. etc. with proper designation marking on each connector.
  - viii. Suitable Industrial grade input power socket for Mains & DG Power supply has to be provided.
  - ix. Power outlets for external equipment such as DSNG (32A, 1Ø socket), microwave links etc.
  - x. Sufficient nos. of SD outputs in selectable aspect ratio between 4:3 and 16:9 are required for recording and feeding to DSNG, OFC etc.
- kk) The equipment layout should be such that the van is balanced from all sides.
- ll) The successful bidder has to obtain the approval of Directorate General of Doordarshan for the Colour Scheme of interior of the van immediately after getting supply order. As the EFP Van will be plying under a national permit, it shall be externally painted in accordance with prevailing Motor Vehicle Act. **The EFP Van should have sleeper driver cabin.**



## 5. Power Supply and Air Conditioning:

- a) The van should be able to operate on three phase (phase to neutral 230 volt  $\pm$  10%, @50 Hz) commercial power Supply.
- b) The offer should also include one set of highly compact 15 KVA On - line UPS having 3-phase input & 3-phase output with 20 minutes backup at 100% load for all equipment and internal lighting load except Air conditioning system. **The bidder should submit the load calculation details for justifying the capacity of the offered UPS.**
- c) The battery bank of the UPS should be suitably placed on shock proof platform capable of withstanding jerks. It should be easily accessible for maintenance and servicing.
- d) Mains and UPS Power Supply status (Aural & Visual) indication should be made available in the Operational Area through Remote Monitoring Facility. It should be clearly visible and audible.
- e) Power Distribution Rack with Metering facilities should be provided in the EFP Van.
- f) Internal lighting suitable for both TV Production and Operation & Maintenance should be provided in the EFP Van.
- g) The interior of the van should be fitted with aesthetically designed script lights. Adequate quantity of **LED** light fittings to give proper illumination needed for operation and maintenance.
- h) The Mains AC and DG Power feeding terminal block should be provided external to the Van suitably located to avoid direct exposure to rain water. The connectors & cables should be of the best quality & adequate capacity with enough headroom.
- i) The offer should also include aesthetically designed, high quality Power Distribution Panel(s) with on load Change-over Switch with provision of operating on mains and DG supply, Digital Metering & Monitoring Panels, Separate Circuits & Switch Gears for equipment racks, internal lighting and air conditioning according to the estimated load requirements.
- j) Technical and Power Earthing for Video, Audio and Power equipment should be properly done as per the standard.
- k) The van should be fitted with 3 phase power supply driven inverter type Air-conditioners of sufficient tonnage capacity to provide adequate cooling necessary for all the equipment and operators. The temperature in all areas of EFP Van should be maintained at  $21 \pm 1$  degree Celsius. The offered air conditioners should provide uniform cooling throughout the EFP Van. There should be 2 or more number of Air conditioner units to facilitate redundancy in the event of failure of one of the units.





- l) **The requirement of Air-conditioning is estimated to be about 6 TR with break-up like 3 TR capacity in Production Area, 3 TR capacity in Audio Area, CCU, VTR, Slow Motion & Equipment Area. However, it is essentially required from the integrator to give the calculation of the estimated heat load and give the full design of the A/C system for the EFP Van. In case, the heat load calculated by the bidder is more, the Air-conditioning system of suitably higher rating shall be offered.**
- m) The distribution of conditioned air in various cabins should be planned in such a way that each outdoor A/C unit will cater to multiple cabins so that conditioned air is available in all the cabins even in case of failure of any unit.
- n) The hot air path of the air conditioning plants should be obstruction free.
- o) The mounting of Air-conditioning equipment should be such that it does not cause any hindrance to movement and parking of van.
- p) The bidder must ensure and certify that service support for the offered UPS and Air conditioning equipment is locally available where the van is to be supplied.

#### **6. Technical Specifications & System Requirement:**

The General specifications of the System applicable to all the equipment are given in **Appendix-I**.

#### **7. Complement of Equipment for the EFP Van:**

- a) This EFP Van should have the entire supportive infrastructure like Monitoring, Routing, Communication, Distribution of Reference Sync Signal (Genlocking) etc.
- b) The Van must have enough flexibility in adapting changing requirements from the technical and operational point of view.
- c) The make and model/part no. of each and every equipment/item/ installation material etc. should be clearly mentioned in the offered Bill of Material (BoM).
- d) The Bill of Material (BOM) has been provided in Appendix-II. The bidder is required to provide the complete list of equipment, software and accessories etc. including the technical furniture offered to meet the specifications requirement. The quantity of each item including sub-module etc. are to be specified clearly and compulsorily, failing which the bid will liable to be rejected summarily. The following is the proforma for the BOM:



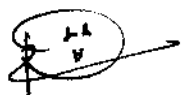
Sr. No.	Description/Name of the item	Make	Model	Part No., if any	Qty.
1.	2.	3.	4.	5.	6.

## **8. Technical Specifications of Major Equipment:**

- a) All the equipment in the offer should be from internationally reputed and leading manufacturers of their respective industry, who have proven records of offering high class, high MTBF equipment.
- b) The offer should also include the detailed technical brochure and technical manual containing all the technical specifications of such equipment.
- c) Any substandard equipment included in the offer may cause the rejection of complete offer with the sole responsibility of bidder.

### **8.1 EFP Camera Chains:**

- a) The EFP Van should be designed, wired and equipped for 06 HD cameras. However, 4 Nos. of Complete camera chain including HD lenses, CCU, Camera Support Systems etc. should be part of the offer.
- b) Four numbers of HDTV cameras are required to be offered. All the cameras should be of same make and model. The necessary support for large lenses, if required, should also be provided. All cameras should be of broadcast quality and should have 3 nos. of 2/3" (FIT/FT/AIT) CCDs, 16:9 Aspect Ratio, 1920 x 1080 or better native resolution sensors, 2.2 Mega pixel or better, 16-bit A/D conversion, supporting 1920 x1080/50/1 HDTV standard, with 60dB or better S/N Ratio, 1000 Horizontal TV Lines or better.
- c) All the cameras should be offered with high resolution 5" HD Electronic B/W CRT viewfinder equipped with a high performance picture tube having more than 650 TV lines horizontal resolution at screen centre or 9" HD Colour LCD viewfinder equipped with LED backlit LCD panel having the resolution of 1280 (H) x 768 (V) pixels **or** 7.4-inch OLED viewfinder having 960 x 540 (quarter HD). The Viewfinders should have front and rear tally lamps. Rear tally lamp should be bright and large enough to be visible clearly from all the angles. The Viewfinder should draw power supply from camera head.
- d) Apart from these view finders, the bidder should also additionally offer 1 no. of eyepiece View Finder for shoulder operations.
- e) The Camera should have focus assist function to make more accurate and fine focus adjustments through the viewfinder.
- f) The offered camera should be capable of Lens Aberration Corrections based upon the suitable data provided by the lens.



- g) The offered cameras should have provision of real time self-diagnostic system for checking the working of the various circuits with a provision to display the status in the viewfinder and RCP.
- h) The Camera head is required to be connected with CCU/ Base Station through hybrid optical fiber cable with Lemo Connectors.
- i) The Camera head should be equipped with dual motorized filter wheel one each for CC and ND filter. These should be remotely controllable from the RCP.
- j) Besides the HDTV Video output, the base station/ CCU should also provide SDTV output. RCP should be joystick type and should have full control of camera settings. RCP should also display f-number, filter position etc. RCP should be 1/4 19" rack size.
- k) Each camera should be supplied with one number of dual muff headsets for communication. In addition to these, four number of headsets should also be offered for engineering communication from base station/ CCU for each of the EFP Vans.
- l) The bidder has to provide 4 nos. of HD lenses as detailed below:
  - (i) 22 X or better (minimum focal length 7.3 to 7.6 mm) with 2X built in extender, servo zoom and servo focus: **2 nos.**
  - (ii) 40X or better (minimum focal length from 9.7 to 10 mm) with 2X built in extender; servo focus and servo zoom with quick zoom facility, built-in optical image stabilizer and suitable large lens adapters for the offered cameras: **2 nos.**
- m) Four nos. of camera support systems of reputed make such as Vinten, Shotoku, Sachtler or Cartoni having 150 mm Ball base and two stage tripod & matching Dolly should be offered after calculating the full payload of offered camera, lens & other accessories. The Head of the Camera Support system should have continuously variable perfect counterbalance and drag system.
- n) All the cameras and Lenses should be offered along with suitable hard carrying cases and rain cover. The tripods should be offered with soft carrying case.

## 8.2 Slow Motion Server:

The design should also accommodate one no. of 4 Channel HD/SD Slow Motion Video Server. **The Server is not part of the offered system and will be provided by Doordarshan.** The bidders have to integrate the Video Server with the EFP Van. The rack space & I/O cabling for this Video Server should be planned accordingly.

### 8.3 VCRs/Deck:

The design should also accommodate 2 nos. of VCRs/Decks (to be provided by Doordarshan). The rack space & I/O cabling for the above VCRs should be planned accordingly.

### 8.4 Character Generator & Graphics:

- a) The Van should be designed for accommodating one SD/HD switchable Character Generator with 2D graphics capabilities. It should be possible to edit all features on preview channel while the program output is on Air (Same text on Air, but editing should only reflect only after take). The offered Character Generator should have SD/HD switchable SDI I/Os.
- b) It should be possible to edit all features on preview channel offline even of the program output on air.
- c) The Character generator should support Unicode characters. The offered fonts should have attributes like scalable font size, bold, italic and combination of these attributes.
- d) Apart from English, the Character generator should be supplied with C-DAC regional language fonts for Hindi, Assamese, Bengali and Malayalam.
- e) It should be possible to Genlock the character generator to an external reference sync so that it can be mixed, dissolved, cut and keyed in production switcher.
- f) The character generator should be based upon user friendly drag and drop graphical user interface and should be easy to use in live environment.
- g) It should be possible to create single line as well as multi-line text on a single page. It should also be possible to create multiple pages in a document.
- h) It should be possible to create multiple layers in a page.
- i) It should have multiple simultaneous crawls in both the directions, rolls, and tickers.
- j) It should support various graphics file formats such as TGA, JPEG, BMP, TIFF etc., animation and video file formats.
- k) The CG should have animation effects for text and logos including cut and paste tools.
- l) The CG should facilitate wipes and effects to page transition as well as texts. It should be possible to provide some basic animation to these effects.



- m) It should have real-time 2D DVE effects and graphics layer animations, including roll and crawl.
- n) It should have built-in downstream keyer.
- o) The system should have spell check capability and correction from in-built library of words.

### **8.5 Digital Production Switcher and Router:**

- a) The switcher should be perfectly designed for mission critical application with auto switchable redundant power supplies for frame and control panel. The main frame of the switcher electronics should not exceed 4 RU.
- b) The switcher should be designed for HDTV production.
- c) The offered switcher should have 32 inputs and 16 outputs including Auxiliary Outputs.
- d) Out of 32 video inputs at least 4 inputs should be multi-format and should have internal Up-conversion to accept SD sources. Out of 16 video outputs at least 2 outputs should be multi-format and should have internal Down-conversion to provide SD outputs.
- e) During SD to HD up conversion, the aspect ratio of the converted signal should be pillar box. Similarly, in case of HD to SD down conversion the aspect ratio of the signal should be letter box.
- f) The switcher should have two full function multi-format M/E's and each M/E should have minimum of four built-in full function keyers along with modifier. All full function keyers should have linear, luminance key and Chroma key, mask, matt, fill and key invert.
- g) The switcher should be equipped with at least 4 Nos. of 2D DVEs capable of resizing and reposition of respective window on the screen.
- h) The switcher should have minimum of 4 channel internal Frame memory to store at least 900 frames of HD resolution. It should be possible to instantly recall the stored frame/clip. It should support embedded audio for the stored clips. It should be possible to import frame/clips through a suitable interface.
- i) Each M/E should have wipe generators with pattern generators having possibility to modify various wipes with softness, position, aspect ratio, rotation, multiplication, modulation, border width, border softness and border color etc.
- j) Each M/E should have matte generator capable of multicolor wash and assignable to background, key fill and border fill.
- k) It should be possible to create transition/wipes using graphics from the frame memory. It should have enough memory to store various



effects, timeline and macro control settings. It should be possible to edit and recall these settings.

- l) The switcher should have ergonomically designed compact control panel of 24 directly accessible cross point source buttons in ME Buses and remaining through shift operation. It should have capability to map all the sources to any cross point.
- m) The operational buttons in the control panel should be well illuminated.
- n) It should have assignable Mnemonic display for the directly accessible cross-point buttons of the control panel with excellent visibility and viewing angles.
- o) The switcher should have tally output for all the inputs.
- p) The control panel should be equipped with high resolution touch screen internally or externally (minimum 14 inch of diagonal size) having instant functionality selection with intuitive user control.
- q) The switcher should have macros to automate multiple keystroke operations and can be recalled with a single button press. The macros should be editable through control panel buttons.
- r) It should have built in format-independent multi-viewer capable of storing and recalling layouts with minimum two independently configurable outputs for production monitoring.
- s) It should be possible to control external devices such as Recorders, Video Server directly from the switcher through suitable broadcast industry standard interfaces.

#### **8.6 32 x 32 HD/SD-SDI AUTO-SENSING ROUTING SWITCHERS:**

- (a) The bidder should offer one number of 32 x 32 HD-SDI/SD-SDI type Digital Routing Switcher should also be provided with 2 nos. of X-Y RCPs and 4 nos. of single bus RCPs. These panels will be used for routing inputs to recording machines, slow motion servers, for standby switching and for technical monitoring.
- (b) The offered HD/SD SDI Routing Switcher should be highly rugged and reliable supporting 1080/50/1 format for HDTV.
- (c) The offered routing switcher should accept HD-SDI signals on any of the inputs and should route the desired input to any of the desired outputs.
- (d) The offered routing switcher should have X-Y and single bus RCPs.
- (e) Routing Switcher should be genlockable with the local reference sync.



- (f) The offered Router should be transparent to embedded audio. It should also have Dolby E and AC-3 audio pass facility.
- (g) The offered Routing Switcher should have auto switchable redundant power supply units.

(h) **Brief Technical Specifications:**

I.	Input	: HD-SDI with embedded audio (i/c Dolby E and AC3 pass).
II.	Output	: HD-SDI with embedded audio (i/c Dolby E and AC3 pass).
III.	Connector	: BNC
IV.	Impedance	: 75Ω
V.	Return Loss	: > 15 dB
VI.	Signal Level	: 800mV± 10%
VII.	Equalization	: Automatic up to 75 m or more (at 1.5Gb/s) for Belden 1694A or equivalent cable

### 8.7 Monitoring Equipment:

The following provisions of various types of Video monitors and Waveform monitors are required to be made in the EFP Van:

- A. The bidder should offer two nos. of 32 input Multiviewer having dual head output for facilitating simultaneous monitoring of 32 HD/SD-SDI sources spread on dual 49" LED Video monitors at Production Control Room has to be offered by the bidder.
  - i. The Multiviewer should accept at least 32 numbers of HD-SDI/SD-SDI Video signals and display them as per the created layouts.
  - ii. The Multiviewer should simultaneously deliver high resolution output in DVI-I or HDMI connectors and in BNC connector for driving the LED-LCD displays.
  - iii. The offered system should have dual head output to cater two displays simultaneously with either same or different layout of the available 32 video signals.
  - iv. The unit should have accessible & user friendly controls on front panel for quick preset recall of various individual sources or different Layouts.



- v. In addition to the video images, the multiviewer should facilitate displaying other information's like internally generated Analog & digital Real time clocks, Time-code, Tally, Source names and alarms.
- vi. It should also display the Embedded audio signals as bar graphs either at the side of each channel or overlaid on respective Video sources.
- vii. The unit should have the cascading facility to increase the number of windows in single display.
- viii. The Multiviewer should facilitate in customizing the layouts dynamically to suit the requirements.
- ix. The software required for the above should be user friendly. For altering aspect ratio and saving the layout/configuration for different set ups computer interface should be provided along with required software and peripherals.
- x. For the reliability, Multiviewers should have dual power supply.
- xi. The offered system should generate alarms like Video loss, Freeze Picture, incorrect luminance/black level, Audio loss, silence and excessive audio levels.

B. Provision of two numbers of 4K resolution HDR capable LED Television Monitor of reputed brand horizontally stacked in line to be used as Video Wall in Production Control Room with following features:

- i. The offered monitor should incorporate high intensity & high contrast wide screen of size 49" (diagonal) and wide viewing angle LCD Panel to view stable images from various angles - both horizontally and vertically, with no reduction in picture contrast, brightness and colour saturation.
- ii. The LED monitors should have thin bezel to have a seamless video wall.
- iii. The monitor should use 4K UHD resolution display panel delivering high brightness, vibrant colour and High Dynamic Range (HDR) picture.
- iv. The Monitors should have Input source connector matching the offered Multiviewers.
- v. The incorporated LCD panel should employ LED backlight technology to make offered monitor thinner and lighter with lower power consumption. It should have faithful colour reproduction.





- vi. The offered monitor should support 16:9 aspect ratio format of the video signal.
  - vii. The offered monitor should have a minimum response time and high refresh rate for viewing fast moving picture like sports events without motion artifacts such as blur, judder etc. It should therefore reproduce smooth, sharp and clear fast moving images.
  - viii. The product should have high reliability for continuous operation.
- C. Provision of 10 nos. of 9" LCD/TFT LED backlit video monitors with HD-SDI & SD-SDI, wide screen & Anti-glare/Anti-reflection protection, 1920 x 1080 or better resolutions, high contrast ratio, high brightness, tally, tiltable mounting, third party tally and IMD support etc. is to be made for the sources monitoring at various locations as detailed below:

Sr. No.	Description	Qty.
<b>(I) CCU Area</b>		
a)	Cameras	6 nos.
<b>(II) Slow Motion &amp; VCR/Deck Area</b>		
a)	Record/Play-out of channels of slow motion servers	2 nos.
b)	VCRs/Decks	2 nos.
	<b>TOTAL</b>	<b>10 nos.</b>

- D. Provision of 4 nos. of 17" LCD/TFT LED backlit video monitors with HD-SDI & SD-SDI input, wide screen & Anti-glare/Anti-reflection protection, 1920 x 1080 resolutions, high contrast ratio, high brightness, tally, tiltable mounting, third party tally and IMD support etc. is to be made for the monitoring at various locations as detailed below:

Sr. No.	Description	Qty.
<b>(I) Audio Area</b>		
a)	Program Output	1 no.
<b>(II) CCU Area</b>		
a)	Cameras/ PGM	2 no.
<b>(III) Spare</b>		
a)	PGM Monitoring (with standalone Desktop stand)	1 no.
	<b>TOTAL</b>	<b>4 nos.</b>

- E. Three numbers of Dual Input HD/SD Digital Wave form Monitor along with cabinet having facility of simultaneous display of waveforms of both the input signals should be offered. These WFM are required to be integrated at CCUs Desk. These WFMs should be wired so that all the 6 cameras can be monitored simultaneously using dual input provision and simultaneous monitoring facilities of both the inputs of WFMs.

- F. One no. of HD/SD-SDI Digital Wave form Monitor with cabinet and following display facilities should also be offered additionally for maintenance purpose:
- (i) Eye/Jitter pattern display
  - (ii) Audio display capability
  - (iii) Data Analysis capability
- G. One no. of Audio Monitoring Station having HD-SDI, AES/ EBU and analogue audio with audio bar graph and speaker should be included in the offer.

#### **8.8 Peripherals & Other Video Equipments:**

- a) One set of Dual SPG with Auto Change-over facility should be included in the offer. The offered System should be able to work as Master/Slave SPG. It should have HD Tri-level, Bi Polar Sync, Analog Black Burst, VITC, and LTC Time code Signal outputs. **It should have built-in GPS receiver and should be supplied with GPS antenna and cable.**
- b) Two nos. of digital Frame Synchronizers with HD-SDI and SD-SDI Input/Output are also required to be offered to integrate the external sources with the Production Switcher in the Van. The offered digital Frame Synchronizers should also function as up/down/cross converters. The offered system should be of size 1RU and standalone type.
- c) The adequate nos. of digital & analog peripherals including Re-clocking type of digital distribution amplifiers, Embedders and De-embedders are required to be included in the offer. **Multiple nos. of outputs of PGM and AUX buses in SD-SDI, HD-SDI, Composite Video, Analog & AES/EBU audios etc are required to bring at the tail board of the EFP Van.** Sufficient nos. of digital and analog peripherals should be offered for these purposes.
- d) All the card type peripheral equipment should be housed in rack frame having redundant power supply.

#### **8.9 Audio Mixer and other Audio Equipment:**

- a) The Broadcast Quality Digital Audio Mixer should have 12 non-motorized 100 mm fader modules along with input assign facility. The following features are required in the mixer:
  - i) The offered digital audio mixer should be fully modular in design and should have auto-switchable redundant power supply unit.
  - ii) The mixer should have excellent frequency response, low Total Harmonic Distortion, and high S/N ratio.
  - iii) The mixer should have PFL facility. It should also have built in test oscillator.



- iv) It should have monitoring and talkback facility. It should have monitoring for PGM, REC & all Aux busses. It should also have talkback facility to all Aux Busses.
- v) Should have built-in four-band Graphic equalizer with dedicated control knobs.
- vi) Should have dedicated control knobs/buttons for Gain control, balancing, PFL, AUX routing, EQ etc.
- vii) Should have Mix-minus busses configurable as AUX send.
- viii) It should have dynamic controller like Limiter, Compressor and Expander on each channel.
- ix) It should have save & recall facility of various configurations for ease of operation.
- x) It should have at least two dedicated Master Buses and two AUX Buses.
- xi) It should have back up facility on USB for configuring the console.
- xii) The mixer should have following Inputs/Outputs:
  - 12 mono mic inputs on XLR with switchable 48V phantom power
  - 4 x Analog line inputs on XLR
  - 4 Stereo AES/EBU inputs on XLR
  - 8 analog line outputs on XLR
  - 4 Stereo AES/EBU outputs on XLR
- xiii) **All the audio Input/Outputs should be on XLR. If required, necessary break-out cables should be offered.**
- b) The bidder should also offer four nos. of good quality near field Ampli-speakers having AES/EBU and analog audio inputs for PGM audio monitoring in various production areas of the EFP Van.
- c) The bidder should also offer two nos. of good quality Stage Monitoring system & two nos. of good quality Audience Monitoring system along with necessary stand.
- d) The bidder should also offer adequate no. of ADAs for source/PGM audio distribution in various production areas of the EFP Van. All the outputs of the offered ADAs should have an individual level control on each output.

#### **8.10 Other Miscellaneous Items:**

- a) The EFP Van should be provided with a reputed brand GPS Clock with digital clock display.



- b) The bidder should offer a latest **Laptop computer with 15" Wide view TFT Screen** and all accessories with latest hardware configuration. The offered laptop should be supplied & installed with rack mountable sliding tray. The Operating System software should be available in original media and licensed to Doordarshan. This laptop should have and support the required ports and connectors for connecting various equipment for configuration and diagnostic purposes. The soft copies of operation and maintenance manuals of all the equipment should also be loaded in this Laptop in another partition of HDD.
- c) The EFP Van should also be provided with a hand held & high precision Infrared Thermometer Gun for monitoring & measuring the temperature of electrical contacts of various electrical devices.
- d) The EFP Van should also be provided with a Tally controller to display tally in monitors, camera and IMD in monitors.

#### **8.11 Intercommunication System:**

- a) The firm should offer a Digital Intercommunication System. The offered digital matrix should be of 16 ports with redundant power supply unit.
- b) 19" rack mountable Producer Station and other remote control panels should be provided within the EFP van wherever required as per the design and lay out of the van. The Producer Station and other remote control panels should have alphanumeric electronic displays for various keys. All the panels should be with gooseneck microphones. **One audio output of the Director/Producer command from intercom system should be available on XLR/free end cable for embedding into the final Program Output for sending the Director/Producer command to the Broadcast Station through DSNG/MW/OFC.**
- c) Two numbers of wired belt packs with miniature dual muff headsets should be offered for FMs.
- d) Two numbers of wired belt packs with IFB should also be offered for anchors/talents.

#### **8.12 Power Supply System:**

- a) Power Distribution Panel with the required switchgears like On load Change Over Switches, Bypass switches, MCCBs, MCBs, Phase sequence switch, digital Phase sequence meters, digital Volt and Ampere Meters, digital frequency meters etc. should be provided. The required numbers of Sub Distribution Panels should also be provided. The entire Switch Gears should be of high quality and should be of reputed brands such as L&T, Siemens etc.
- b) The van should have the provision of connecting external mains power supply and diesel generator supply with the necessary on load changeover facilities. There should be a provision to bypass the UPS in case of any failure. The change over and bypass switches should be on



load full capacity MCCB type and not contactor based to ensure interruption free supply on change over.

- c) The power cables to be used for internal wiring for various purposes should be of adequate rating with sufficient headroom, fire retardant and of the best quality.
- d) Flexible mains 3 ½ core copper cables of 10 sq.mm (approx.) size of 125 meters length should also be included in the offer.

## **9. General Terms & Conditions:**

### **9.1 Completeness of the System:**

- (a) Completeness of the system is the responsibility of the bidder.
- (b) The successful bidder will be solely responsible for commissioning and operationalisation of the system to the satisfaction of Doordarshan as per the specifications requirement.
- (c) If the firm feels that the system required as per the specifications may need additional hardware & software for better functionality, the firm may quote the items as an **Optional item** and provide full justification to decide its utility.

### **9.2 Software:**

**The software of all the equipment including Operating System, Application software etc. are required to be supplied in original media and should be licensed to Doordarshan with perpetual validity.**

**A certificate to this effect is also required to be submitted by the bidder, along with the bid.**

### **9.3 Compliance:**

- (a) **A point by point full compliance statement in respect to all the parameters related to the concerned equipment/item(s) laid down in the specifications from the respective principal manufacturers is to be enclosed along with the offer in the format given below. Mere signature on the copy of DD specifications shall not be accepted as a compliance statement.**

**The figures so mentioned should be supported by record of these in the technical literature enclosed with the tender and reference to the page number of enclosed literature for all features and technical specifications should be mentioned in the relevant column. Offers without the compliance statement or with incomplete compliance statement will liable to be rejected with the sole**



responsibility of the bidder. **Any deviation from the specification detailed in the compliance statement is to be highlighted separately.**

Sr. No of DD specs.	DD specs.	Compliance (Yes/No)	Performance Fig. of equipment Offered	Reference to the Page Number of enclosed	Deviations, in case of non-	Optional items if any required to make the system Compliant to	Features in the offered Product which exceeds DD
1.	2.	3.	4.	5.	6.	7.	8.

- (b) In addition to above, a separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for all the equipment/item(s) should also be submitted along with the bid by the bidder in the above mentioned proforma.

In case the bidder does not have requisite experience and enters into an MOU with a partner, the point by point compliance statement in respect of all the points laid down in the specifications for all the equipment/item(s) shall be duly signed by the bidder as well as his partner.

- (c) In addition to the above, authorization from respective principal manufacturers in respect of the equipment listed below should necessarily be submitted along with the bid:-

- i. Camera Chain
- ii. Zoom Lens
- iii. Camera Support System
- iv. Character Generator
- v. Digital Production Switcher
- vi. Routing Switcher
- vii. Multiviewer
- viii. 9" and 17" Video Monitors
- ix. Waveform Monitor
- x. Audio Monitoring Station
- xi. Sync Pulse Generator
- xii. Frame Synchronizer



- xiii. Digital Peripherals
- xiv. Audio Mixer
- xv. Intercommunication system

#### **9.4 Technical Literature:**

One set of printed technical and operation & maintenance manuals for all the equipments is to be provided on non-returnable basis along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored. The successful bidder will have to supply one set of printed operation, service and maintenance manuals with respect to each equipment, along with the van.

#### **9.5 Training:**

Two weeks comprehensive operation and maintenance training at each location on all the equipments such as Cameras, Production Switcher, Audio Console, CG, Server, Intercom system etc. should also be the part of the offer. The bidder has to provide the comprehensive training material in the form of hard copies as well as soft copies to the trainees during the training session.

**The training schedule is required to be submitted at least one month in advance by the successful bidder.**

#### **9.6 Guarantee:**

- (a) With reference to the clause no.8.2 of the "General Terms and Conditions (GTC)" under ANNEXURE-II of tender document, the complete system including all items/equipment, vehicle & chassis should be guaranteed for **three years** of trouble free operation from the date of commissioning. In case of any item or equipment failure including software and hardware within this period, the same shall be rectified or replaced free of cost to Doordarshan at the site. In case, it is not rectified within one week, replacement of the equipment shall be arranged by the bidder.
- (b) The guarantee should cover all hardware, software and modules of the complete system, including vehicle.
- (c) The firm will provide up gradation of all the offered software free of charge during the guarantee period. **The firm will be required to give undertaking to this effect, alongwith the bid.**

#### **9.7 Delivery Period:**

The firm shall deliver the Multi-camera Mobile Production Facility complete in all respect in accordance with the specifications, within 6 months from the date of supply order.



The delivery period does not include training and Vehicle registration as per clause 4(y).

### **9.8 Inspection:**

The equipment shall be subjected to inspection by Doordarshan officials.

### **9.9 Enclosures:**

The bidder must necessarily submit the following enclosures along with the technical bid:

- (a) Compliance statement with respect to all the points of the specifications duly signed by the OEM should be submitted for all the equipment. The reference to the page number of enclosed literature for all features and technical specifications should be essentially mentioned in the relevant column of the compliance statement.
- (b) A separate point by point compliance statement duly signed by the bidder or bidder as well as the partner, as applicable, in respect of all the points laid down in the specifications for all the equipment/ item (s) in the proforma mentioned in clause no. 9.3 (a).
- (c) Certificate as required vide clause no. 9.2
- (d) An undertaking as required vide clause no. 9.6 (C).
- (e) EFP Van layout indicating all operational areas such as production, CCU, VTR, slow motion and Audio etc.
- (f) Details of the stowage area.
- (g) Detailed Video and Audio schematics including block diagrams etc.
- (h) Power supply schematic with the layout of power switchgears, PDP etc.
- (i) Intercommunication schematic.
- (j) Power supply load calculation sheet. Power supply schematic with the layout of power switchgears, PDP etc.
- (k) The details of the offered vehicle and design details of the vehicle.
- (l) Air-conditioning details including heat load calculation and system design.
- (m) Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the model no. and technical specifications.
- (n) **Product/Model specific User list of the offered product.**





(o) Work experience details including contact details of the clients and supporting documentary evidence.

(p) Any other document mentioned elsewhere in the tender document.

**The tender is liable to be rejected in the absence of the above enclosures with the sole responsibility of the bidder.**

\*\*\*

A handwritten signature or mark, possibly a stylized 'S' or 'K', enclosed in a circle with a horizontal line extending to the right.

**GENERAL TECHNICAL SPECIFICATIONS APPLICABLE TO ALL THE EQUIPMENT**

<b>1. System</b>	:	<b>HDTV:</b> 1920x1080/50/I conforming to SMPTE 292M and ITU-R BT. 709 (CIF)(amended up to date) (HD-SDI: 1.485 Gb/s) and <b>SDTV:</b> 625/50i (4:3 aspect ratio) conforming to SMPTE 259M and ITU-R BT. 601(amended up to date) (SDI: 270 Mb/s, PAL, 2:1 Interlace, 25 frames/s, 50 fields/s). The video in both the systems is associated with embedded audio.
<b>2. Digital processing</b>	:	<b>HDTV:</b> 4:2:2, Y: 74.25 MHz, Pr: 37.125 MHz, Pb: 37.125 MHz Sampling rate, 10 bit quantization. <b>SDTV:</b> 4:2:2, Y: 13.5 MHz, Pr: 6.75 MHz, Pb: 6.75 MHz Sampling rate, 10 bit quantization.
<b>3. Power supply</b>	:	230 Volts $\pm 10\%$ , 50 Hz
<b>4. Operating temperature</b>	:	5 to 40 Deg. Celsius
<b>5. Relative humidity</b>	:	30% to 85%
<b>6. Mounting/Dimensions</b>	:	Standard 19" Rack mount in case of Stand alone Units. Otherwise 19" Rack mounting frame housing the units should be provided.
<b>7. Connectors</b>	:	
a) Video	:	75 $\Omega$ BNC
b) Audio	:	3 Pin XLR/75 $\Omega$ BNC
c) Control	:	BNC/Mini XLR/RS-422/GPI/Ethernet as applicable
<b>8. Video Signal</b>	:	
a) Digital Video	:	0.8 V p-p $\pm 10\%$ , across 75 ohms.
b) Reference signal	:	1080/50/I HDTV Tri-level sync and PAL black burst
<b>9. Audio</b>	:	
	:	(a) Embedded audio unless specified otherwise.
	:	(b) AES/ EBU
<b>10. Time code</b>	:	VITC on black and LTC



**Appendix-II****Suggestive Bill of Material for each EFP Van**

<b>Sr. No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Remarks</b>
<b>(A)</b>	<b>Video Equipment consisting of :</b>		
<b>(I)</b>	<b>EFP Camera Chains:</b>		
1.	<p>Digital HD Camera Chain including Base Station, Camera Control Unit with individual RCP, Tripod Adaptor, 9" HD Colour LCD or 7.4-inch OLED Viewfinders (The Viewfinder should draw power supply from camera head) and LEMO Connectors for HOFC cables with the following major specifications:</p> <p>2/3" CCDs (FIT/AIT/FT),  16:9 Aspect Ratio,  Supporting 1080/50i Format,  16 bit A/D Conversion or better,  2.2 Mega Pixel or better,  F10 at 2000 lx (3200K, 89.9% reflectance),  60dB S/N Ratio or better,  1000 Horizontal TV lines or better,  Gain : (-3 dB to + 12 dB),  Dual motorized optical filters one each for CC and ND filter remotely controlled from RCP  Bayonet lens mount,  All cameras should be provided with necessary Hard Carrying Case and rain covers  19" Rack Mountable Base Stations with LEMO Connectors for HOFC cables should also be quoted.</p>	4 Nos.	Similar to Sony's HDC 1700, Ikegami's HDK 79GX, Hitachi SK HD 1000E
2.	2" HD eye piece viewfinder for the cameras in A. (I). 1	1 No.	matching with the above cameras
3.	Dual muff camera headsets	6 Nos.	Matching with the cameras
4.	Broadcast Quality EFP HD Digital Zoom Lens 22X or higher (minimum focal length 7.3 to 7.6 mm) with Built in 2X Zoom Extender, Servo Zoom and Manual Focus	2 Nos.	Similar to Fujinon HA 22X 7.3 BERM, Canon HJ22ex 7.6B IASD, Essentially quote other accessories such as Zoom

			Demand Units & Focus Manual Grip.
5.	Broadcast Quality HD Digital Zoom Lens 40 X or better (minimum focal length from 9.7 to 10 mm) with Built in 2X Extender, Manual Focus, Servo Zoom, with quick zoom facility, Built in Optical Image Stabilizer, Large Lens Adapter & Support for the offered cameras.	2 Nos.	Similar to Fujinon HA42x9.7 BERD, Canon HJ40x10B IASD. Essentially quote other accessories such as Zoom Demand Units & Focus Manual Grip.
6.	Camera Support System with 150mm Ball base supporting above mentioned cameras and 22X & 40X EFP type lens along with Two stage Tripods, Matching Dolly for EFP applications. Necessary soft carrying case should also be provided.	4 Nos.	Similar to Vision 250 of Vinten, SX300 of Shotoku and Master of Cartoni along with suitable slide plate to mount 22X & 40X HD lenses.
<b>(II) Character Generator &amp; Graphics:</b>			
1.	Character Generator with SD-SDI/HD-SDI I/O and Support for Indian Regional Languages.	1 No.	Similar to Imagine Communications Nexio TitleOne, Pixel Power Clarity, Avid Motion Graphics Production
2.	C-DAC regional language fonts as specified vide Specifications clause no. 8.4(ii)	1 Set	C-DAC ISM V6 and Tahreer
<b>(III) Digital Production Switcher and Router:</b>			
1.	Digital Production Switcher with 32 HD SDI Input 10 bit Processing or better, Multi format HD/SD Support, 2 M/E, 2D DVE, Image Store, 16 Outputs and Redundant Power Supply for both Control Panel & Main Frame etc. as specified in the specifications.	1 No.	Sony MVS 3000A, For-A HVS2000, Ross Carbonite Plus, Snell Kula or Similar
2.	32 x 32 HD-SDI and SD-SDI Digital Routing Switcher with redundant power supply along with 2 nos. of X-Y RCPs and 3 nos. of single bus RCPs.	1 set	Similar to Imagine Communications, Evertz, Ross, Snell, Grassvalley, Nevion make
<b>(IV) Monitoring Equipment:</b>			
1.	High resolution Multiviewer having 32 or more HD-SDI & SD-SDI Input video sources, 2 or more SDI outputs and DVI-I or HDMI outputs with dual redundant	2 set	Similar to For-A, Evertz, Grassvalley

	Power Supply.		
2.	4K HDR LED Television of size 49" or more	2 Nos.	SONY KD-49X7500F SAMSUNG UA49NU7100 PANASONIC TH-49FX730D or similar
3.	17" HD SDI & SD SDI input LCD/TFT video monitors with wide screen & Anti-glare/Anti-reflection protection, 1920 x 1080 resolutions, high contrast ratio, high brightness, tally etc.  <b>Note: Out of 4 Monitors, 1 monitor should be provided as Spare with standalone desktop mount.</b>	4 nos.	Similar to SONY LMD- A170, Ikegami HLM-1760 WR, KROMA LM 7017, TV Logic XVM-175W
4.	9" HD SDI & SD SDI input LCD/TFT video monitors with wide screen & Anti-glare/Anti-reflection protection, 1920 x 1080 resolutions, high contrast ratio, high brightness, tally etc.  <b>Note: One monitor should be with built-in speaker for off-air monitoring</b>	10 Nos.	Similar to SONY LMD-941W, Ikegami HLM-960 WR, KROMA LM 7109, TV Logic LVM-095W
5.	Dual Input HD/SD Digital Wave form Monitor along with cabinet having facility of simultaneous display of waveforms of both the input signals.	3 Nos.	Similar to WFM 7200 of Tektronix or LV 5800 of Leader
6.	HD/SD Digital Wave form Monitor with cabinet and following display facilities: i. Eye/Jitter pattern display ii. Audio display capability iii. Data Analysis capability	1 No.	Similar to WFM 7200 of Tektronix or LV 5800 of Leader
7.	Audio Monitoring Station having HD SDI, AES/ EBU and analogue audio with audio bar graph and speaker.	1 No.	TSL AMU1-3G Non Dolby, Wholer VMMDA-1 Bel Digital Audio BM- A2-4SHD
<b>(V)</b>	<b>Peripherals &amp; Other Video Equipment</b>		
1.	Dual SPG with Auto Change-over facility and should be able to work as Master/Slave SPG. It should have HD Tri-level, Bi Polar Sync, Analog Black Burst, DARS, Word Clock, VITC, LTC Time code outputs, built-in GPS receiver and antenna & cable	1 set	Similar to Tektronix SPG 8000 with ECO8000, Evertz 5600 MSC with 5600 ACO
2.	Digital Frame Synchronizer with HD-SDI	2 Nos.	Similar to Imagine

	& SD-SDI I/Os and Up/Down & Cross - conversion facilities.		Communications Selenio X50-AV-2PS or FOR-A FA-9520RPS, Snell SV2000
3.	Digital Peripheral Equipment as per the requirement including Embedders and De-Embedders, Re-clocking type Digital Distribution Amplifiers etc. All frames should have redundant power supplies.	1 lot	Similar to Snell, ROSS, GVG, Evertz, Nevion make
<b>(B) Audio Mixer and Other Audio Equipment:</b>			
1.	12 fader broadcast quality Digital Audio Mixing Console as detailed in the specifications.	1 Set	Similar to Studer's On Air 1500, Lawo Crystal, SSL C10HD Plus
2.	Compact size Ampli-speakers with AES/EBU and analog audio inputs	4 Nos.	Genelec 8130A or similar
3.	Audio Distribution Amplifier (ADA) with individual Level control on each output	1 lot	Similar to Snell, ROSS, GVG, Evertz, make
<b>(C) Other Miscellaneous Items:</b>			
1.	GPS Clock with digital clock display.	1 lot	Similar to Imagine Communications, Evertz, Master Clock
2.	Laptop Computer with latest configuration	1 No.	Similar to HP, Dell make
3.	Hand held Mini Infrared Thermometer Gun	1 No.	Similar to Fluke's 62
4.	Tally Controller for Tally as well as IMD	1 No.	Similar TSL TM-1
<b>(D) Intercommunication System:</b>			
1.	16 Ports High Quality Intercom System with wired and wireless belt packs, Producer Station & required nos. of other remote control panels as per the system requirement	1 set	Similar to Trilogy, Telex, Reidel make
2.	Wired belt packs with miniature dual muff headsets for FM's	2 nos.	-Do-
3.	Wired belt packs with IFB for anchors/talents.	2 nos.	-Do-
<b>(E) Microphones:</b>			
1.	Long Shotgun Microphones with stand & operation on both battery and phantom.	2 sets	Similar to MKH 70 of Sennheiser
2.	Shot Gun Microphones with narrow acceptance angle for long distance sound	2 sets	Similar to MKH 416 of Sennheiser



	pick up; Good sound rejection from the sides and rear of microphone, switchable low frequency roll off. Microphones should operate on battery and phantom supply		
3.	Lapel Microphone	3 sets	Similar to MKE2PC of Sennheiser
4.	Reporter's microphone with omni-directional pick-up pattern.	2 Nos.	Similar to MD 42 of Sennheiser
5.	Plug-on transmitter to make any of the above microphones RF microphone and true diversity receiver	2 sets	Similar to SKP 2000 and EM 2000 of Sennheiser
<b>(F) Installation Materials:</b>			
1.	All kinds of Installation Materials i/c HD Patch Panels with 2.5 GHz bandwidth & Normal through type, Audio, Video, OFC, Triax, Data, Control, Power Cables, Audio-Video Racks, Tail Boards, Connection Terminals etc.	1 lot	
<b>(G) Power Supply &amp; Air-conditioning Equipment:</b>			
1.	15 KVA or higher, 3phase-input and 3 phase output On Line UPS system with 20 minutes backup	1 set	Similar to APC, Pillar, Eaton make
2.	Power Distribution Panel	1 set	
3.	Mains/DG Distribution Panel	1 set	
4.	On load Change over Switches, MCCBs, MCBs, Phase Reversal Switch, Digital meters for phase sequence, frequency, Voltage, Ampere, Terminal Blocks, Power Cables, Amphenol and Other Installation Materials etc.	1 lot	Switchgears similar to L&T, Siemens make
5.	Inverter type Split Air conditioners with multiple Outdoor and multiple Indoor units of approx. 6TR or more capacity	1 set	Similar to Daikin, Hitachi make
<b>(H) Hybrid Fiber Optical Cable &amp; Audio-Video Cables etc.</b>			
1.	Optical Fiber cable 10 mtrs. Of length with necessary connectors at both ends <b>for bench test</b>	1 no.	
2.	Optical Fiber cable 50 mtrs. Of length with necessary connectors at both ends	1 no.	
3.	Optical Fiber cable 100 mtrs. Of length with necessary connectors at both ends	3 nos.	
4.	Optical Fiber cable 300 mtrs. Of length with necessary connectors at both ends	3 nos.	
5.	HOFC cable connector cleaning Kit	2 sets	

6.	4 pair flexible low loss microphone cables similar to Belden make (roll of 300 meters) with connectors on both ends	2 nos.	
7.	4 pair flexible low loss microphone cables similar to Belden make (roll of 200 meters) with connectors on both ends	2 nos.	
8.	Assorted audio- video cables, 4 x 100 mtrs, 4 x 50 mtrs, 4 x 25 mtrs, 10 x 1 mtr, 10 x 60cm with connectors on both ends	1 lot	
9.	Motorized Cable Drums for Audio, Video, OFC cables.	1 lot	
<b>(I) Vehicle, Body Building &amp; Technical Furniture etc.:</b>			
1.	Vehicle equipped with GVW 16 tons approx. Capacity diesel engine with Sleeper Cabin for driver and preferably BS-IV emission compliant	1 No.	Similar to Tata Motors, Ashok Leyland etc.
2.	Van Chassis and Body Building etc.	1 lot	
3.	Vehicle Registration in favour of Doordarshan including permit, insurance & road tax as detailed below:- (i) One time Vehicle Registration Charges (ii) Road Tax for one year (iii) Comprehensive vehicle insurance for one year (iv) All India National Permit for 05 years along with validity fee payment for one year (subsequent year's validity fee to be paid by the Consignee Kendra)	1 lot	
4.	Modular, Sturdy and Ergonomically designed Production Desk, Audio Desk, CCU Desk, Slow Motion Desk, Recording Desk and Engineering Desk along with other Technical Furniture including revolving chairs for operator etc.	1 lot	
5.	Vehicle reversing set including proximity sensors, rear view camera(s) along with LCD screen(s) in driver cabin.	1 set	
6.	Portable Fire Fighting Equipment for various cabins including Driver's cabin	1 for each Cabin	
7.	Digital Thermometer & Humidity meter in each cabin	1 lot	



8.	Integrated foldable Aluminum ladder	1 lot	
9.	Tool bag consisting of essential Mechanical & Electrical tools, Cable Crimping tools (Video, Data), Soldering station, Digital Multi meter, Clip-on Meter etc.	1 lot	
<b>(J) Any other Essential item(s) required:</b>			
1.	Any other essential item(s)/equipment/ installation material/works required for completion of the work on SITC basis to make the system fully functional in all respect	1 lot	
<b>(K) Training:</b>			
1.	Two weeks comprehensive operation and maintenance training at the site on all the equipments such as Cameras, Production Switcher, Audio Console, CG, Intercom system etc.	1job	
<b>(L) Software &amp; Documentation:</b>			
1.	The software of all the equipment including Operating System and Application software etc. are required to be supplied in original media and should be licensed to Doordarshan with perpetual validity.	1 lot	
2.	Operation & Maintenance Manuals of each & every equipment	1 set	

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**CONSIGNEE DETAILS**

Sl. No.	Zone	Location of Doordarshan Centre	Qty.
1.	<b>East Zone</b>	DDK Guwahati	1 No.
2.	<b>South Zone</b>	DDK Thiruvananthapuram	1 No.

