



प्रसार भारती/ PRASAR BHARATI

भारत का लोक सेवा प्रसारक/ INDIA'S NATIONAL PUBLIC SERVICE BROADCASTER

आकाशवाणी महा निदेशालय /DIRECTORATE GENERAL: ALL INDIA RADIO

योजना और विकास एकक आकाशवाणी भवन, संसद मार्ग, नई दिल्ली-110001

P & D UNIT, AKASHVANI BHAWAN, SANSAD MARG, NEW DELHI-110001

[क्रय अनुभाग /PURCHASE SECTION]

No. 01(41)11/NIT-33/2019-D(P)/ 675

Dated: 09.10.2019

**Notice inviting e-Tender No. 33/2019**

E-tenders are invited for and on behalf of Director General, All India Radio under two bid systems for Supply/SITC/SETC of the following Equipments from firms registered with DGS&D/NSIC and from reputed manufacturers/authorized agents and stockiest dealing with the equipments as detailed below:

Sl. No.	Tender Ref. no.	Description of Stores	Qty.	Estimated Cost of work/ Procurement (Rs. in Lakh)	EMD (Rs. In Lakh)	Tender Submission Date/Time (online)	Tender Opening Date/Time (Online)
1	No. 12(40)11/ CES/2019-D(P) /665/D(P-S) Cell	SITC of Augmentation Captive Earth Station at 3 AIR Stations at CES AIR Mumbai, Chennai & Kolkata.	3 Stations	120.00	2.40	21.11.2019 (02:30 PM)	21.11.2019 (03:00 PM)

**NOTE:**

- The bid forms, General Instructions to Bidders and other details including amendments/ changes can be viewed/ downloaded from the website [www.tenderwizard.com/PB](http://www.tenderwizard.com/PB).
- Tender notice is also available on the Prasar Bharati and AIR website [www.prasarbharati.gov.in](http://www.prasarbharati.gov.in) and [www.allindiaradio.gov.in](http://www.allindiaradio.gov.in) respectively (using the link: Tender) and CPP PORTAL on website <http://eprocure.gov.in>.

हृदेश कुमार  
09/10/19

(हृदेश कुमार/ Hirdesh Kumar)

निदेशक (अभि.)/ Director (Engg.)

कृते महा निदेशक आकाशवाणी/for Director General: All India Radio

E-mail: [depurchase@prasarbharati.gov.in](mailto:depurchase@prasarbharati.gov.in)

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प्रसार भारती/ PRASAR BHARATI

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P & D UNIT, AKASHVANI BHAWAN, SANSAD MARG, NEW DELHI-110001

[क्रय अनुभाग /PURCHASE SECTION]



No. 01(41)11/NIT-33/2019-D(P)/674

Dated: 09.10.2019

**Notice inviting e-Tenders No. 33/2019**

**A) GENERAL INSTRUCTIONS TO BIDDERS:**

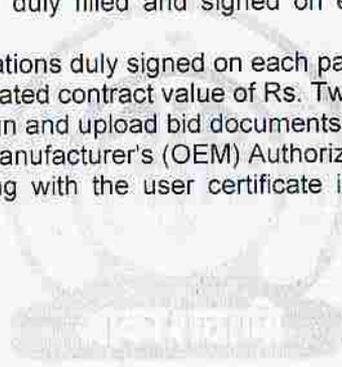
1. The scope of work for stores to be tendered are available in the complete bid documents which can be viewed / downloaded free of cost from Prasar Bharati portal [www.prasarbharati.gov.in](http://www.prasarbharati.gov.in) or AIR portal [www.allindiaradio.gov.in](http://www.allindiaradio.gov.in) or e-tender portal of AIR <http://tenderwizard.com/PB> or CPP Portal <http://eprocure.gov.in>.
2. Both Technical Bid and Financial Bid will be submitted concurrently duly digitally signed in the website <http://tenderwizard.com/PB>.
3. No claim shall be entertained on account of disruption of internet service being used by bidders. Bidders are advised to upload their bids well in advance to avoid last minute technical snags.
4. All Corrigendum/Amendment/Corrections, if any, will be published on the website <http://tenderwizard.com/PB>.
5. All documents / papers uploaded / submitted by the bidder must be legible.
6. It is mandatory for all the applicants to have Class-III Digital Signature Certificate (in the name of person who will sign the bid document) from any of the licensed Certifying Agency.
7. To participate in the e-tendering submission, it is mandatory for the applicants to get registered their firm/joint venture with the e-tendering portal of AIR <http://tenderwizard.com/PB> to have user ID & Password from M/s ITI Ltd., The Annual registration charges for vendor/supplier are ₹ 1,000/- (Rupees Two Thousand Only) per annum.
8. To participate in e-bid, bidders shall be charged e-tendering processing charges @ 0.1% of estimated contract value with minimum Cap-₹ 500/- only and maximum cap-₹ 5000/- only.
9. a) Bid document contains certain conditions for Manual submission of tender and are now redundant. Document shall be deemed to have been modified to that extent.  
b) Paying Authority will be respective Pay & Accounts office of the Zonal Office.
10. Page No. shall be given on each and every paper/documents serially uploaded in the technical bid.
11. Bidders shall ensure to quote rate of each items. If any cell is left blank and no rate is quoted by the bidders, the rate of such item shall be treated as "0" (Zero).
12. The Earnest Money shall be in the form of FDR/ Bank draft/Bank Guarantee from an Indian scheduled Commercial Bank in case of Indian supplier or Bank guarantee/Demand Draft in equivalent freely convertible foreign currency in case of Foreign supplier, in favour of **PB, BCI, DG:AIR, New Delhi**.
13. 'EMD deposit' shall be placed in a single sealed envelope superscripted with tender reference no. and date of opening so as to reach Assistant Engineer in Room No.326/329, P&D Unit, Akashvani Bhawan, DG: AIR, New Delhi before scheduled time on prescribed tender opening date. EMD received late shall be summarily rejected. Hard copy of any other tender document shall not be accepted.
14. The successful tenderers will be required to furnish Security Deposit within 30 days of placement of contract at the rate of 5% (five percent) for indigenous supplier and 10% (ten percent) in case of foreign supplier of value of contract in one of the acceptable forms as per tender documents.
15. Tenderers may ask any clarification, if required, before the date stipulated in the details of tender items for the purpose. After that no request will be entertained.
16. Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or are registered with the Central

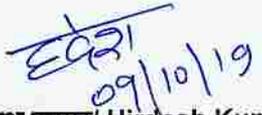
*Handwritten signature and date: 09/10/19*

- Purchase Organisation or the concerned Ministry or Department or Startups as recognised by Department of Industrial Policy & Promotion (DIPP) for the items required in NIT shall be exempted from payment in respect of cost of Earnest Money as per the Government instructions on the subject on submission of documentary evidence of valid Registration.
17. The purchaser reserves the option to give Purchase preference to the offer from Public Sector Units and/or from Small Scale Cottage Industries Units over those from other firms, in accordance with policies of the Government of India from time to time.
  18. Tenderers shall separately indicate the rate and amount of GST/IGST etc. as applicable on the date of tendering in their offer failing which the offer will be summarily rejected.
  19. Tenderers have to submit GST Registration Certificate while uploading the tender.
  20. Tenderers shall separately indicate the HSN/SAC code, rate and amount of GST/IGST as applicable on the date of tendering in their offer, failing which the offer will be summarily rejected.
  21. IGST and Compensation Cess (wherever applicable) will be levied on imports.
  22. Public Procurement (Preference to Make in India) Order No. P-45021/2/2017-B.E-II dated 15.06.2017 of Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion shall be applicable.
  23. Terms Conditions given in specification will supersede for conflict with any terms and condition given in AIR Tender Document.
  24. In Repeat Order Clause 6.9, page-10 and Clause 22, page-52 of AIR Tender Document, 50% may be read as 25-30%.

**B) LIST OF MANDATORY DOCUMENTS (to be uploaded with tender):**

1. Copy of EMD.
2. AIR Tender Document duly filled and signed on each page along with all Annexures and amendment.
3. AIR Technical Specifications duly signed on each page.
4. Integrity Pact (for estimated contract value of Rs. Two Crores or more) duly filled and signed.
5. Letter of authority to sign and upload bid documents.
6. Original Equipment's Manufacturer's (OEM) Authorization for Equipment quoted.
7. Past performance along with the user certificate in respect of Supply/ SITC/ SETC of the Equipment quoted.



  
(हृदेश कुमार/ Hirdesh Kumar)  
निदेशक (अभि.) / Director (Engg.)

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**PRASAR BHARATI**  
**DIRECTORATE GENERAL: ALL INDIA RADIO**  
**(PLANNING & DEVELOPMENT UNIT)**

**Specification Document for SITC of Augmentation of Captive Earth Station  
at 3 AIR Stations at CES, AIR Mumbai, Chennai & Kolkata**

ADD. DIRECTOR GENERAL-E : ADG-E.(EZ,SZ,WZ) AIR&DD  
SPECIFICATION NO : TC/SPEC/1/2014/CES-7/Part/IEBR  
DATE OF APPROVAL : 25/09/2019  
DATE OF REVISION : 29/08/2019  
NO OF PAGES : 15  
APPROVAL FILE NO. : 1(11)/2018-SCD/CES/MCPC

SUMMARY OF CONTENTS:-

1.	INTRODUCTION	---	Page No. 2
2.	SECTION A	Bill of Material & General Specifications/ Requirements	Page No. 3-08
3.	SECTION B	Technical Specification & Requirement	Page No. 09-12
4.	SECTION C	Draft ATP for CES equipment	Page no. 13-14
5.	ANNEXURE-I	Representative Block diagram of CES-	Page No. 15

  
27/09/19

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Assistant Engineer  
DG : AIR

PRASAR BHARATI  
DIRECTORATE GENERAL: ALL INDIA RADIO  
(PLANNING & DEVELOPMENT UNIT)

1(5)/2014-TC/CES-XII plan

**Subject:** Specifications for SITC of Augmentation of Captive Earth Station at 3 AIR Stations i.e Mumbai, Kolkata & Chennai under IEBR.

**INTRODUCTION:-**

AIR requires Augmentation of Captive Earth Stations (CES) at 3 Stations ie. Mumbai, Kolkata & Chennai to uplink its Radio programmes for distribution in its network through Satellite. The Captive Earth Station under reference is to be augmented at 3 Stations. The Programmes uplinked by these CES will be received by other AIR stations with their Radio Networking (Receive) Terminal (RNT) and used either for Recording or for Broadcasting through their Terrestrial Transmitters.

A Representative diagram of CES is placed at Annexure-I at page no.15.

  
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Assistant Engineer  
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## SECTION-A

## 1. BILL OF MATERIAL:

AIR requires following Equipments/Services as per specifications detailed under section A & B. Tenderer shall quote price of each item separately with necessary breakup keeping in view of the following.

- (i) Make and Model of Each Item is to be mentioned.
- (ii) Intender reserve full right to choose schedule the quantities of Equipments/Service etc. at the time of placing order.
- (iii) All items mentioned under mandatory items will be taken into consideration for ranking purpose.
- (iv) Present requirement is for AIR Mumbai, Kolkata & Chennai

**Mandatory Items per Site**

S.No.	Item	Quantity	Reference
1.	(i) Digital Encoder	2 Nos	Section B-1
	(ii) Digital IF Modulator(1+1) in Hot Stand by configuration with Auto Changeover Unit Comprising Digital IF Modulator -2 Nos. Auto- Changeover Unit-1 No.	1 Set	Section B-2
2.	Receiving system: (i) Professional IRD	5 Nos.	B-3
	(ii) Interconnecting cables connectors ( F type male to Male – 10 Nos. of 2 meter each ) & accessories along with L Band Splitter 1:8- 1 No.	1 Set	B-4
3.	Details of any other items, required for complete integration of the system	1 Set	
4.	Installation, Testing & Commissioning of Augmentation of CES System at Site	1 Job	B-5
5.	Inspection	1 Job	A-7
6.	Manuals	1 set	A-9
7.	Operation & Maintenance Training at Site	1 Job	A-8

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**2. Quantity:**

Total Quantity is to be Triple as per BOM at Section A -1 for AIR Mumbai, Kolkata & Chennai

**LOCATION FOR SUPPLY & INSTALLATION:-**

Supply, Installation, Testing and Commissioning at AIR Mumbai, Kolkata & Chennai.

**3. SCOPE:**

The scope of this tender includes supply of the equipment as per specifications, technical requirements and quantities as detailed in the tender along with Installation, testing and commissioning of the equipments as per mutually accepted ATP.

**4. ELIGIBILITY:**

The bidder shall have proven experience of carrying out SITC of Earth Station or, related experience. Bidder shall provide documentary proof (With attested copies of certificate from client including contact details like Telephone nos. and e-Mail address of successfully carrying out at least one work of SITC.

**5. SCHEDULE OF MATERIAL:-**

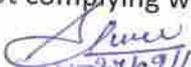
A comprehensive schedule of material offered shall be attached with the offer as mentioned in Section A-1 in the same format as price bid minus the price. Price against each item as indicated in Section A-1( Bill of Material ) shall be mentioned separately item wise.

**6. COMPLIANCE**

The compliance from Original Equipment Manufacturer (OEM) only will be considered. While complying to the specification, it may be noted that just mentioning 'complied' will not suffice. Compliance should be supported by proper data/ documentation and should substantiate the specifications. In compliance statement each specification item complied, reference of compliance documents page no. etc. should be indicated.

One no of Encoder, Digital Receiver and Modulator shall have to be submitted within one month of opening of Technical Bids for testing its compatibility.

Each page of the datasheet/specification shall be duly signed, with seal, by both the OEM and tenderer. The full name, Postal and Telephone contact details including E-mails address of the person signing on behalf of OEM must be indicated on at least one of the pages. Bids not complying with the above shall be rejected.

  
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## 7. INSPECTION:

Inspection of the Equipments and Testing of the installed Equipment shall be done as per mutually accepted and approved Acceptance Test Procedure (ATP). Draft ATP is annexed keeping the requirements of SITC.

### a) Pre-dispatch Inspection:

Pre-dispatch Inspection of the Equipments shall be carried out at Integrator's works by the Engineers(s) of All India Radio. The expenses towards to and fro journey, DA and lodging as per Govt. Of India norms will be borne by Prasar Bharati. The performance certificate along with measurements taken on all equipments (duly certified by OEM) is required to be submitted by the tenderer before inspection at their premises.

During the Pre-dispatch inspection, supplier shall put up all the equipments for test on the test bench at integrator premises before the AIR representative and shall provide electric energy, consumable materials, and tools. Testing instruments, and assistance of required kind for carrying out acceptance tests. All the individual factory test reports of the complete lot of the equipment shall be made available to the inspecting authority before inspection. Complete Specifications and Details for each equipment will be checked and all parameters/ values will be measured as per ATP. Typical details are enclosed in draft ATP. Details ATP shall be submitted by the Firm/OEM and after mutual discussion it shall be approved and inspection shall be carried out on these lines. Three weeks prior intimation for carrying out inspection at Works is to be given by the supplier to the indenter. Inspection charges, if any are to be quoted separately in the commercial bid.

### b) Site Inspection:

After completion of Installation of all the equipments at the Station, final inspection of the installation at the Station will be carried out by the representatives of AIR for certifying the Installation. This inspection will include visual examination of the installation, overall performance measurements and any other measurement/ examination considered necessary by AIR. At least seven working days' prior notice shall be given by the supplier for conducting final Site Acceptance Test.

## 8. TRAINING

The tenderer shall provide one day training to AIR Engineers on Setting up, Configuration, Operation and Maintenance of the Equipments at each Station.

  
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## 9. MANUAL/ DOCUMENTATION & TEST CERTIFICATES

**Manual:** 1 Set for each concerned station, One Set for Directorate & one Set for concerned Zonal Office. Each manual shall consist of following.

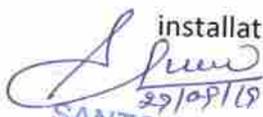
- a) Manual for operation, configuration, maintenance of each equipment, sub system, NMS, accessories and complete integrated link along with drawings and wiring diagram for the system.(both hard soft copies)
- b) Test procedures for parameters measured at subsystem and integrated system levels.
- c) Test records/reports of all the measurements performed for each equipment and integrated system.

## 10. DELIVERY PERIOD:-

The Delivery Period for SITC and handing over of complete installation for all the sites shall be Two (2) months from the date of AT.

## 11. GENERAL REQUIREMENTS:

- a. **Technical/General Details**
  - i) The Tenderer, in order to enable the indenter to carry out the full Technical Evaluation of the Tender, should give all the details required to ascertain full merits and demerits of the technical offer. Apart from printed technical data/specs of the equipment from the OEM, Block schematic upto the sub-system, interconnection and wiring diagram should be give.
  - ii) The equipment offered shall be of renowned make, well established and field proven. All the equipments should conform to the power supply and environmental requirement as detailed in para A-13.
  - iii) The tenderer may be asked to demonstrate the equipment to show compliance to AIR's specification at the technical evaluation stage.  
**One set of Encoder, IF Modulator and IRD receiver shall be submitted by tenderer at technical evaluation stage for checking compliance with DTH Free to AIR STB ( This is mandatory).**
  - iv) This equipment shall be of state of art technology, capable for 24 x7 operation. It should be incorporated with standard feature of safety and protection.
  - v) Installation & Commissioning at respective stations shall be carried out without any disruption of AIR/Doordarshan Services. This may require installations at some sites to be carried out even during night hours for

  
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- which adequate arrangements will have to be made by the supplier at no extra cost to the indenter.
- vi) The tenderer shall ensure that the equipments offered fully incorporate the standard feature of safety and protection including shielding from EMI/RFI as the receive end of the link will be installed at high power transmitter site.
  - vii) Apart from printed technical data/specs of the equipment, Block schematic upto the sub-system, interconnection and wiring diagram, photograph etc. must also be attached with the offer.
  - viii) Successful bidder may conduct site survey at all the Stations, if felt necessary, to ascertain the conditions at Stations for facilitating installation of indoor equipments.  
Minor changes at site, if any, necessitated due to site conditions shall have to be taken care of by the supplier during installation without any extra cost to the indenter.
  - ix) After Acceptance of the tender, the successful tenderer shall also provide detailed plans of supply of material, testing and commissioning as per ATP.
  - x) During the installation of these equipment, supplier shall be responsible for safety and security of his material and personnel. At the same time the supplier shall also ensure that there is no damage to AIR material and personnel
  - xi) The successful tenderere shall fully discharge all obligations under the Indian Workmen's Compensation Act in so far as it affects the workmen under his employment.
  - xii) Maintenance support including availability of spares for baseband equipment is to be ensured for at least 10 years from the date of supply. Details of the same should be mentioned in the tender. If at any stage during next ten years the manufacturer proposes to stop production of these equipment and spares, supplier shall intimate AIR in advance to enable AIR to stock the critical items of spares for the life of the equipment
  - xiii) The tenderer shall mention the source of supply (with proper authorization) for major and critical components/ spares so that no difficulty is encountered later on in procuring the spares for maintenance/repair of these equipment.
  - xiv) The firm/tenderer must ensure repairs within 72 hours at site & in case the equipment cannot be repaired at site then the firm shall bear all the charges including to from freight charges to repair the equipment within or outside the country during the warranty period. For all equipments

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after sales service is to be ensured for post warranty period also for 10 years.

**13. ENVIRONMENTAL & POWER SUPPLY**

- a) Ambient Temperature:-  
-10° C to +40°- For indoor equipment
- b) Relative Humidity : Upto 95% non condensing at 40° C
- c) Safety/Features : Standard features for safety & protection have to be build in/ incorporated for both personnel/equipment.
- d) Power Supply : 230 VAC± 10%, single phase, 48-52 Hz.

  
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**SECTION -B****TECHNICAL SPECIFICATIONS****1. AUDIO BASE BAND DIGITAL ENCODER:**

S.No.	Parameter	Specification
1.	Audio Input	Analog and Digital AES/EBU compatible as standard professional, which can be selectable in each stereo channel.
	No. Of Channels	8 Stereo
2.	Audio encoding Format	MPEG-1& MPEG4 With AAC,AAC LC, AAC .HE v1 & v2
3.	Mode	Stereo, Dual Mono channel
4.	Encoding rate	64 kbps to 384 kbps
5.	Sampling frequency	48 KHz
6.	Audio Frequency Range(Analog)	50 Hz to 15 KHz, $\pm 0.5$ dB
7.	Distortion	<0.1 % from 50Hz to 15KHz
8.	Signal to noise ratio	$\geq 80$ dB
9.	Output	DVB-ASI
10	ASI Input	Built-in / External multiplexer for encoder cascading of upto 10 Mbps ASI stream
11	Input power	230 VAC normal, 50 Hz
12	Operating temperature	0 to + 50° C

**2. DIGITAL IF MODULATOR (1+1) WITH Auto Changeover Unit**

<b>Modulator is to be DVB S/S2 Compliant</b>	
ASI Inputs	2nos.
Compliance	1 Backward compatible mode.(Should be capable of operating on both DVB-S & DVB-S2/ IP mode, one at a time) 2 Constant Coding and Modulation (CCM)
Input bit-rate	64 kbps to 10 Mbps
<b>Forward Error Correction and Modulation Scheme</b>	
FEC Coding(LDPC), Reed Solomon & Convolution	DVS-S: $\frac{1}{2}$ , $\frac{2}{3}$ , $\frac{3}{4}$ , $\frac{4}{6}$ , $\frac{7}{8}$ DVS-S2: $\frac{1}{3}$ , $\frac{2}{5}$ , $\frac{1}{2}$ , $\frac{3}{5}$ , $\frac{2}{3}$ , $\frac{3}{4}$ , $\frac{4}{5}$ , $\frac{5}{6}$ , $\frac{8}{9}$ , $\frac{9}{10}$
Spectrum Roll off factor	DVB-S: 10%,15%, 25% and 35% selectable DVB-S2: 20%, 25% and 35% selectable

  
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Modulation Format	DVB-S:QPSK DVB-S2: QPSK
Baud Rates	Variable, 0.05 to 10 M symbols/sec
<b>IF OUTPUT INTERFACE SPECIFICATIONS</b>	
Output Frequency range	52 to 88 MHz tunable
Synthesizer Step Size	1 KHz, step
Frequency Stability	< $\pm$ 0.1 khz(all causes over 10 years)
Output Impedance	75 ohms unbalanced
Connector	BNC, female
Output Return Loss	>20 dB(50-90MHz)
Output Level Range	-20 to 0 DBm
Level Step Size	0.1 dB, steps
Spurious Outputs	<-65 dBc/4KHz@-10dBm
Synthesizer Phase Noise	Meets requirements of IESS-308
CW mode	Selectable
Noise floor(C/No)	< -120 dBc/Hz
Spectrum sense	Normal/Inverted

**Note:**

- A) Auto changeover unit should be from same OEM of Modulator  
 B) The Tenderer shall demonstrate all quoted equipments for confirming compatibility with CES, NBH, AIR Delhi setup as part of Technical evaluation.

**3. Professional IRD Receiver**

The IRD should have a front panel display and one should be able to enter or edit all the parameters for a perfect reception of the signals. There should be provision for observing the BER of the signal and signal level on the front panel. It will be required for receiving Audio Signal Only.

**RF Parameter Specifications:**

(a)	Input Frequency Range	950-1750 MHz
(b)	No. Of Inputs	1 nos.
(c)	Tuning Step Size	1 Hz
(d)	Satellite Frequency Bank	C-& KU-Band, selectable
(e)	Input Impedance	75 Ohms
(f)	Input Connector	F-Type Female
(g)	Output Connector	XLR for analog & AES-EBU or,Break-out Box with XLR.
(h)	Input Power Range	-30 to -65 dBm per carrier
(i)	De-modulation Method	DVB-S QPSK,DVB-S2 QPSK demodulation
(j)	Variable Symbol Rates	256 symbols/sec to 10 M symbols/sec
(k)	Convolutional Inner FEC Rates selectable	R=1/2,2/3,3/4,5/6,7/8( DVB -S, QPSK) R=1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9,

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		9/10(DVB-S-2, QPSK)
(l)	IF filter Bandwidth	Automatic selection( Dependent on Symbol Rate

#### Audio Decompression Parameters

- (a) Audio Decompression Type: i) MPEG-1 Layer-II Audio  
i.e. Dual Mono, Stereo  
ii) MPEG-4 with AAC, AACLC & AAC HE v1 &v2.

#### **Audio Output:-**

Each analog audio output shall be presented as a stereo pair. In the event of "Mono" transmission, as the same encoder input channel side will be output to both left and right connector.

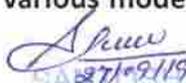
#### **Analog Audio Output Specifications**

Parameter	Specification
(a)Output Impedance	600 ohm(balanced)
(b)Number of Outputs	4 Stereo, configurable as Stereo, Joint Stereo Mono, Dual mono.
(c)Connector Type	XLR Male Socket or with suitable Adapter
(d)Data Rate	64-256 kbps(MPEG-1, layer 2 AND MPEG-4 selectable

#### **Audio Performance Specifications (at 48 KHz sampling rate)**

(a) Frequency Range (Analog)	50 Hz to 15 KHz, $\pm 0.5$ dB
(b) THD+N (1 KHz at max. Level)	0.1% from 50Hz to 15 KHz.
(c) Dynamic range	$\geq 80$ dB
(d)Cross talk at 1 KHz	$\geq 80$ dB
(e)Signal to noise ratio	$\geq 80$ dB

**Note:** The IRD offered should be able to receive both SCPC and MCPC signal IRD shall be able to receive free to AIR Doordarshan's DTH radio signals. Interoperability with various models of different Makes shall be checked during technical evaluation stage.

  
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DG - AIR

For this purpose the supplier shall be required to submit one no. IRD to AIR for checking compliance.

#### 4. INTER-CONNECTING CABLES, CONNECTORS AND ACCESSORIES

Interconnecting RF & Audio cables, power supply cables, connectors, audio patch chord (20 nos. Assorted length) and other accessories required for the monitoring system shall be included in the tender.

#### 5. INSTALLATION & COMMISSIONING

Installation will include all the equipments within the wired racks in the present Base band Rack of concerned CES. All BOM mentioned is to be integrated to the existing system. Commissioning Certificate will be issued by the official posted at respective CES ie, Mumbai, Kolkata & Chennai.

  
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## SECTION 'C'

### DRAFT ATP

#### 1. INTRODUCTION

This document describes the Acceptance Test Procedure (ATP) for testing the various units of Augmentation CES Equipment under procurement. It covers the details of the item to be tested, list of equipment required for testing and the tests required to be carried out.

#### 2. ITEMS TO BE TESTED

- a) Digital Encoder and Modulator.
- b) Monitoring System comprising IRD.

#### 3. TEST EQUIPMENT

- a) All requisite test equipment conforming to the required standard for testing and commissioning shall be provided by the supplier
- b) List of the test & measuring equipments.

(This is a tentative list. Additional equipment shall be specified by the indenter if needed).

- i. Audio analyzer and Spectrum Analyzer
- ii. Digital Modulation Analyzer.
- iii. PC with Printer.
- iv. Any other equipment and standard reference source/setup necessary for measurements.
- v. Calibrated Directional coupler, inter-connecting cables, Attenuator, combiner, Dividers, adapters etc. as may be necessary for the test.

#### 4. TEST REQUIRED TO BE CARRIED.

(Note: This is only a tentative list, Additional items of tests may be specified and carried out by the indenter, if needed.

##### 4.1 DIGITAL MODULATOR AND DIGITAL ENCODER

- a) Functionality test for individual modulator and in (1+1) configuration

  
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- b) I.F. Range
- c) O/P Frequency stability and accuracy
- d) O/P level stability
- e) Coding standard, data rates check
- f) Digital modulation selectability check
- g) All Base-band measurements along with receivers.
- h) Spurious Check
- i) Any other test to check the conformity to the specs.

#### 4.2 MONITORING SYSTEM

- a) Functionality check for individual monitoring setups for Digital Demoluator.
- b) Test for IRD Receiver including carrier lock range. Eb/No, Analogue and digital (AES/EBU) outputs, level, THD, Noise level, Freq. Response and Cross Talk for both stereo channels, BER immunity test etc.

#### 5. GENERAL

- a) Based on above, supplier shall give a detailed ATP document giving procedure for tests of individual item as well integrated setup. This should include test setup, equipment details, inter-connections diagram and the Format for test reports.
- b) The indenter will examine the same and then it will be finalized after mutual discussion.

  
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