सत्यम् शिवम् सुन्दरम्

प्रसार भारती
PRASAR BHARATI
(Broadcasting Corporation of India)
दूरदर्शन महानिदेशालय
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New Delhi – 110 001

File No. 19(2)2018-19E1 (P) TV **Dated: 06.05.2019**

Subject: Draft Specification for SITC of Uplink Antenna System and UPS System for Earth Stations.

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 or on following Address:

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Specification For: Draft Specification of SITC of Uplink Antenna System and UPS System for Earth Stations.

Specification no: SATD/New_ES/May_2019
Due Date to offer Comments: **21.05.2019**

Encl.: As above (40 Pages)

6/5/19
Prabhat Kumar Singh
Assistant Engineer
For DG: DD

Prasar Bharati
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Specification for

"SITC of Uplink Antenna System"
and
"UPS System"

for

EARTH STATIONS

Specification No.: SATP/New_ES/MAY_2019
Date: 03/05/2019

Specification No.: SATD/New_ES/MAY_2019

Technical Specification for "SITC of Uplink Antenna System
(7 Earth Station Locations- Chandigarh, Lucknow, Chennai, Thiruvananthapuram, Kolkata, Bhubaneswar and Ahmedabad)
and
UPS System
(11 Earth Station Locations- Lucknow, Jallandhar, Jaipur, Jammu, Shimla, Chennai, Thiruvananthapuram, Kolkata, Bhubaneshwar, Ahmedabad and Bhopal)"

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1. Introduction :

This document lays down technical specifications for the following:

1.1 Supply, Installation, Testing and Commissioning (SITC) of Uplink Antenna System for 7 Locations namely Chandigarh, Lucknow, Chennai, Thiruvananthapuram, Kolkata, Bhubaneswar and Ahmedabad.

1.2 SITC of Three Phase 2x20 KVA UPS System for the Digital Earth Station at 11 Locations namely Lucknow, Jallandhar, Jaipur, Jammu, Shimla, Chennai, Thiruvananthapuram, Kolkata, Bhubaneshwar, Ahmedabad and Bhopal.

2. Scope :

The scope of the work shall include the following but not limited to :

2.1 Supply, Installation, Testing & Commissioning of one 7.3 - 7.6 M V/L Parabolic Dish Antenna (UPLINK PDA) for the Digital Earth Station at Ahmedabad, Bhubaneswar, Kolkata, Chennai, Thiruvananthapuram, Lucknow & Chandigarh on turnkey basis, at each Earth Station and interfacing with HPA systems.

2.2 All interconnecting material including waveguide, waveguide flanges and bends RF cables & connectors, Copper Power supply cables and connectors etc.

2.3 SITC of Wave Guide supports tray (approximately 45 mtrs) per site and cable tray between Up-link UPLINK PDA to Earth Station Room.

2.4 SITC of three phase 2x20 KVA UPS including remote monitoring panel for monitoring of UPS system in control room for the Digital Earth Station at Lucknow, Jallandhar, Jaipur, Jammu, Shimla, Chennai, Thiruvananthapuram, Kolkata, Bhubaneshwar, Ahmedabad and Bhopal on turnkey basis, at each Earth Station.

2.5 Installation of Uplink antenna and obtaining NOCC clearance from Government agencies at each site.

2.6 Associated items required for the project like interconnecting copper power supply cables with copper connectors/thimbles (Flat/bottle type) etc. from output of AVR at DEP to Input of UPS, Output of UPS to existing SDB panel and interconnecting cables of various changeover switches of mains/ battery bank etc. are also to be provided.

2.7 Remote monitoring panel for UPS in Earth station monitoring room is to be provided.

2.8 Earth Pits for the UPLINK PDA and UPS at each site.

3. Eligibility Criteria :

The Bidder shall have to meet the following eligibility criteria:-

3.1 Uplink Antenna System

3.1.1 Bidders should have a proven track record of carrying out similar uplink Antenna system projects in the past. The list of such projects successfully completed by the bidder in the preceding Six year should be enclosed with the bid.

3.1.2 Bidder should have successfully completed three or more SITC of 7.0 meters or higher sized motorized auto tracking Uplink Antenna System for Earth Stations (i.e. MCPC/SCPC, VSAT Hub, or Teleport) in C band or Ku-band in the immediate preceding past six years.

3.1.3 Copies of work order and successful completion certificate of three nos. 7.0 meters or higher sized motorized auto tracking Uplink Antenna system provided in para 3.1.2 in preceding six year should essentially be submitted along with the bid document.

3.1.4 The offered antenna system should be compliant to the standards of reputed international organizations like NOCC, INTELSAT/ EUTELSAT/ ASIASAT etc.

3.1.5 Bidder shall offer Uplink Antenna systems of only those OEMs who are having past experience of

3.1.5.1 At least five years of manufacturing similar uplink antenna; and

3.1.5.2 Supplying of 10 numbers or more of 7.0 meter or higher size motorized auto tracking uplink Antenna system.

3.1.6 Copies of supply order in respect of above said quantities at para 3.1.5 of Uplink Antenna in preceding past five year should essentially be submitted along with the bid document

3.2 2x20 KVA UPS System

3.2.1 Bidders shall offer UPS system of only those OEMs who are having past experience of :

3.2.1.1 At least five years of manufacturing and supplying 20 KVA or higher rating of ON LINE UPS system for critical load like 24x7 operation of transmission, data centre, Earth Station etc. The bidder shall submit documentary evidence in this regard. The list of such

supply record of OEM of UPS system to various organizations in proceeding past five years must also be provided.

3.2.1.2 OEM of the offered equipment must have manufactured and supplied at least 10 numbers of offered 20 KVA UPS system for critical load like 24x7 operation of transmission, data centre, Earth Station etc in immediate preceding five years. Copies of supply order and receipt certificate of 10 (ten) nos. 20 KVA UPS system provided in preceding past five year should essentially be submitted along with the bid document.

3.3 Bidder not having relevant experience may tie up with other partner/partners having requisite experience as mentioned above. In this case, the partner/partners alongwith the bidder will be responsible for carrying out Design, Fabrication, Supply, Installation, and Testing & Commissioning of the offered System. The documents for requisite experience of the partner/partners along with the bidder are to be submitted along with bid. 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.

3.4 The bidder must have his local office/authorized representative/ dealer in India for after sales support.

3.5 The bidder must have a valid Dealer Possession License at the time of submission of bid. A copy of valid Dealer Possession License should be submitted along with the bid.

3.6 The cutoff date for the experience shall be the date of NIT.

4. Turnkey Implementation and Commissioning :

The project will be carried out on Turnkey basis for Supply, Installation, Testing and Commissioning (SITC) for the following:

4.1 7.3-7.6 M Up-link Antennae are to be installed at the following:

S.No.	Equipment	Place (on Ground/Roof top)
1.	7.3-7.6 M Up-link Antenna System	DDK Chandigarh, DDK Lucknow , DDK Chennai, DDK Bhubaneswar, and DDK Ahmedabad: 100 cms above the Ground.
2.	7.3-7.6 M Up-link Antenna System	DDK Thiruvananthapuram : 200 cms above the Ground
3	7.3-7.6 M Up-link Antenna System	DDK Kolkata: on the Roof top of the building

4.2 Low loss 1/2"corrugated copper RF Cable (suitable for C-Band U/L Frequency) of suitable length as per site requirement for connecting the sample port output of Directional Coupler installed near uplink Antenna feed to existing RF patch panel/spectrum analyzer, is to be provided.

4.3 Similarly, 1/2"corrugated copper low loss RF Cable (suitable for C-Band D/L Frequency) similar to Andrew LDF4-50A or RFS ICA12-50JPL cables with matching connectors having gold plated pins is to be used for connecting output of both LNAs to the indoor electronics.

4.4 Provision of Wave Guide support tray & cable tray between UPLINK PDA and HPA Room.

4.5 Assorted items required for the project like RF cables with connectors (N type, Male & Female), Bullets N type etc. are also to be provided.

4.6 The project will consist of Supply, Installation, Testing and Commissioning (SITC) of the 2x20 KVA UPS and other accessories as mentioned at Clause No. 2, Scope of Work for Lucknow, Jallandhar, Jaipur, Jammu, Shimla, Chennai, Thiruvananthapuram, Kolkata, Bhubaneshwar, Ahmedabad and Bhopal as detailed.

4.7 The UPS system has to operate in conjunction with the existing Building Electrical System and existing Diesel Generator (62.5/125 KVA) to provide power conditioning, back-up power protection, and power distribution for the critical loads.

4.8 Parallel redundant type on line double conversion continuous operation (defined in VFI as the IEC62040-3 UPS Specifications), solid state Uninterrupted Power Supply (UPS) along with battery bank, battery bank change over switch/ switches and interconnecting cables for (1+1) parallel redundant load sharing mode and Standalone operation of UPS, each UPS operating with a minimum 15 minutes battery backup at full rated capacity etc.

4.9 The bidder shall install Remote monitoring panel for monitoring UPS system in the control room of each site.

4.10 Each and every offered equipment and accessories including software should be from internationally reputed manufacturer and the quoted model should be of high class, high MTBF, field proven and in use by leading broadcasters/organizations in various continents of the World. Any customized product which is not field proven in the industry will not be acceptable

4.11 The bidder shall submit only one solution (Single BOM) for the offered system. Bid with multiple options against any requirement is liable to be rejected. BOM shall not contain any optional items as an alternative for any line entry item. However, bidder can offer additional accessory items as options for performance improvement of main line entry item of same make.

4.12 The bidder must ensure completeness of the offered system in all respects. The system should be completed and fully wired for all the indoor equipments fitted in 19" standard racks. The offered system must have enough flexibility in adapting the changing requirements from the technical and operational point of view. The bidder should submit detailed schematics and layouts for proposed solution/ solutions based on the offered equipments along with the offer.
In order to ensure the completeness of the system, any additional equipment/accessories which bidder feels necessary to complete the configuration should also be quoted. However, in such case they should provide proper justification for the additional equipment required.

4.13 As an SITC contract, all supplied equipments are to be installed, tested and commissioned at different sites as mentioned at Clause 4.5 & 4.6 above by the Bidder. The cost of any other interconnecting material and labour required for laying of cables, Earthing, earth pits etc. should be included in the tender.

4.14 Cost of any other work, consultancy and material required to complete the installation & commissioning of the earth station should be taken into account and clearly mentioned while submitting the tender.

4.15 The bidders are required to submit the proposed system design antenna layout drawing, antenna foundation details, Power Supply schematic, Battery layout plan, Battery calculation etc. along with the bid.

4.16 The successful bidder will be required to prepare and submit the final system design as per the site condition in consultation with Doordarshan and get it approved by Directorate General, Doordarshan before actual implementation.

4.17 All interconnecting material including cables and connectors are to be provided by the successful bidder if required.

4.18 The successful bidder will be required to print and display the final Technical Block diagram and Line diagrams of adequate size and Power Supply chain in the facility after the completion of the installation.

4.19 The offer should be complete in all respect.

4.20 Any other work and material required to complete the scope of work.

4.21 The successful bidder must submit the firm's self certified copies of import license at the time of commissioning in respect of RF Equipment for issuance of operating license from WPC.

4.22 For facilitating maintenance issues, bidder must also submit firm's self certified copies of Bill of Entry/Custom Invoice of all imported items to DG: DD for release of PBG.

4.23 All invoices shall bear Serial Numbers of the equipments to meet the requirement of WPC.

4.24 The successful bidder will be responsible for providing after sales support of all the offered equipment for Five years from the date of commissioning including three (3) years warranty period. The bidder must submit undertaking for providing after sales support for additional Two (2) years after the end of warranty period along with bid.

If bidder is not the OEM of the offered equipments, then after sales service support for the repairs/ maintenance for 3 years warrantee period and for 2 years after the completion of guarantee/ warrantee period shall also be provided by the OEM either directly or through its representative in India. A certificate, on the letterhead, in this regard duly signed by the OEM must be submitted with offer by the bidder (annexure no.III).

4.25 The local office/authorized representative/dealer will be nodal point for resolving issues, related to installation, testing, commissioning and after sales support. Details of OEM office and its location are to be provided along with bid.

4.26 If required, bidder may have to give a presentation to explain their technical offer within one week from the date of issue of letter, as part of technical evaluation.

4.27 In the process of technical evaluation Doordarshan can ask for any clarification/ query as required through e-mail/FAX/Post etc, which shall be treated as a part of tender and invariably attended and replied by the bidder within the time stipulated therein.

4.28 Bidder may have to demonstrate the features of equipment offered as and when asked as part of technical evaltuation of Tender. However it will not bestow any right of acceptance of the bid.

4.29 Cross reference in respect of supporting documents, should be given with proper page number and volume no. etc. If required Doordarshan may also ask for any other supporting document to ascertain the claim of bidder and their OEM.

4.30 To avoid any delay due to inter dependent activities like site readiness, providing power supply etc, The bidder should submit time frame for completing the activities up to the commissioning of the set-up on a bar chart starting from date of issue of Purchase Order (P. O.) (i.e. dd/mm/yyyy)+.

4.31 All software being offered, are to be licensed to Doordarshan on perpetual basis without specifying any time limit or without specifying any end of life of the software. Software upgrades within warrantee period will have to be supplied free of cost.

4.32 The bidder may visit the site before the submission of the bid. The bidders desiring to visit the site must submit the request one week in advance with the details of the persons. All visits will take place only during working days from 1500 to 1700 hours only.

5. Technical Specifications of Major Equipment :

a) 7.3 -7.6 Meter Uplink PDA with C band 4 port feed
b) Antenna controller unit
c) Beacon receiver
d) C-band LNA
e) Waveguide
f) Dehydrator

5.1 Specifications for C-Band Motorized Antenna System

The Specifications are for the Supply, Installation and Testing & Commissioning (SITC) of the 7.3 - 7.6 meter motorized auto tracking Uplink Antenna system. The Antenna system will consist of the following:

5.1.1 General Requirements:

(i) The 7.3- 7.6 meter uplink PDA would be used for uplinking digital channels through HPA system. The antenna should conform to latest CCIR recommendations, CCIR Rec. S.580-5 or better, satisfying the 29-25 log (θ).

(ii) Bidder will have to supply, install, test and commission the UPLINK PDA including NOCC clearance for the UPLINK PDAs as per timeline given below. This will also include the UPLINK PDA foundation.

S.No.	Uplink Antenna System for the DDK	To be delivered
1	Chandigarh, Chennai, Kolkata and Thiruvananthapuram	Within 8 months from the date of issue of purchase order or 8 months from the date of the decision letter from WPC provided by DD in respect of RF equipment, whichever is later.
2	Ahmedabad, Bhubaneswar and Lucknow	Within 10 months from the date of issue of purchase order or 10 months from the date of the decision letter from WPC provided by DD in respect of RF equipment, whichever is later.

(iii) The UPLINK PDAs are to be installed on ground at Ahmedabad, Bhubaneswar, Chennai, Lucknow and Chandigarh. The UPLINK PDA foundation platform is to be raised to 100 cm from the ground at all locations.

(iv) The UPLINK PDA is to be installed on ground at Thiruvananthapuram and UPLINK PDA foundation platform is to be raised to 200 cm from the ground.

(v) The UPLINK PDA is to be installed at Kolkata on the rooftop of the building. The foundation work is to be carried out by the successful bidder in coordination with zonal office and site in-charge. The roof strengthening work for the antenna foundation will be carried out by Doordarshan as per the technical requirement of the successful bidder (if required).

(vi) Accessories like C-band LNA, Semi-rigid & Flexible waveguides, Dehydrator, Antenna Controller unit (ACU), Beacon receiver are also to be provided.

(vii) Two Low loss RF cable (1/2" corrugated copper outer and copper or copper clad Aluminium inner conductor similar to Andrew LDF4-50A or RFS ICA12-50JPL cables) (having loss below 18dB at 6GHz for a cable length of 100 meters) for connecting both LNA output to the indoor electronics is to be supplied with the system.

(viii) A detailed diagram showing the Antenna foundation & installation and connection of accessories must be given along with the offer for approval.

(ix) Wave Guide support tray & cable tray are also to be provided at site. The Support polls & Cable tray must be made of galvanized iron material and anti-rust & anti-corrosive paint should be used.

(x) As an SITC contract, all supplied equipments are to be installed, tested and commissioned at site by the bidder. The cost of any other interconnecting material and labour including that for laying of cables, earthing, earth pits, Lightening arrester for antenna etc. should be included.

(xi) Cost of any other work, consultancy and material required to complete the installation & commissioning of the earth station should be taken into account and clearly mentioned while submitting the tender.

(xii) Uplink Feed shall be of the same make as that of offered Antenna or of approved make certified by the OEM of the Feed and OEM of the Antenna.

(xiii) Azimuth, elevation angle indicator shall be available for the operator at the base of the antenna by installing a graduated compass and inclinometer near antenna's azimuth and elevation axis.

(xiv) Azimuth and Elevation movement of Uplink Antenna shall be independent to each other.

5.1.2 Technical Specifications

The uplink Antenna will be used for up-linking TV channels through HPA system. The antenna should conform to latest ITU recommendations and complying following technical specifications.

Sl. No.	Specifications	Requirement
a)	Antenna Type	Motorized, Cassegrain/ Gregorian with sub-reflector
b)	Reflector Type	Solid Segmented
c)	Reflector panel material	Stretched formed or precision formed Aluminium alloy.
d)	Mount type	Elevation over Azimuth
e)	Reflector paint	White heat diffusing paint
f)	Size of Antenna	7.3-7.6 meters
g)	Feed	4 Port Linearly Polarized (motorized)
h)	Sidelobe Performance	As per ITU-R recommendationS.580-5 or better.
ii	**Operating Frequency Band**	
a)	C band Transmit	5.85 GHz to 6.425 GHz
b)	C band Receive	3.7 GHz to 4.2 GHz
iii	**Gain** *(at Mid-band, at Rear Feed Flange)*	
a)	C band Transmit	51.5 dBi (min)
b)	C band Receive	47.5 dBi (min)
iv.	**Noise Temperature of Antenna**	
	a) At 10° elevation b) At 90° elevation	≤ 42K ≤ 33K
v.	G/T at 10° elevation with 30° K LNA	29.0 dB/°k (min)
vi.	Azimuth Travel	180° in maximum 3 continuous 110° overlapping sectors (motorized)
vii.	Elevation Travel	5 to 85° continuous (motorized)
viii.	Polarization Travel	±50° (motorized)
ix.	VSWR (Tx / Rx)	≤1.3 : 1
x.	Transmit /Receive Isolation (Both receive port should have TRFs/diplexer to achieve required isolation)	85 dB minimum
xi.	Power handling capacity for feed (per port)	2.00 KW minimum
xii.	**Wind Speed**	
a)	Operational	70 Km/h

b)	Gusting	95 Km /h
c)	Survival	190 Km /h
xiii.	**Polarization Discrimination**	
	(a) on axis (b) across 1 dB beam width	35 dB minimum 30 dB minimum
xiv.	Both receive ports should have TRFs / diplexers to achieve Transmit- Receive isolation of 85 dB minimum.	
xv.	Both transmit ports should have directional couplers with factory measured coupling ratio printed on it for the full frequency range.	
xvi.	The wind load data, foundation data for installation should be included.	
xvii.	Suitable ladder and platform from the OEM of the antenna should be provided for ease of operation in the offered antenna system. The ladder and platform should be provided such that the azimuth and elevation movement of the offered antenna is not hampered.	
xviii.	All the Ground/Mount structure must be hot-dip galvanized steel (80 micron min.)	
xix.	Antenna System should have hub closeout/covers.	

5.2 Antenna Control Unit:

(i) Antenna controller shall be of the same make as the antenna or as approved by Antenna OEM. The unit should be capable to control azimuth, elevation and polarization.
(ii) The controller shall display the current position of Az., El. and polarization with relative power reference of the received tracking signal strength.
(iii) The antenna controller unit shall be kept at a distance of approx 50 meters away from the antenna. Necessary cabling etc. is to be provided.
(iv) Tracking accuracy should be better than 10% of the receive 3 dB beam width.
(v) Position Encoding shall use single speed brushless resolver or highly reliable encoders.
(vi) Position Encoding resolution: 10 bit
(vii) The system shall also have manual control flexibility for all the three axes.
(viii) Antenna control unit shall be of rack mount type.
(ix) Controller shall have following minimum control modes:
    a. Manual
    b. Step track
    c. Program track

5.3 Specification for Beacon Tracking Receiver

A. Essential Features:

(i) BTR shall be of the same make as that of offered Antenna or of make approved by the OEM of the Antenna.

(ii) Fully frequency agile satellite receiver designed to provide a linear DC reference voltage proportional to the received signal from the satellite beacon through LNA.

(iii) There should be a provision to indicate loss of beacon carrier.

B. Technical Specifications:

S.No.	Specifications	Requirement
i.	Frequency	3.7 GHz to 4.2 GHz
ii.	Tuning Step Size	1 MHz
iii.	I/P level	-70 to -20 dBm
iv.	Tracking response	0 to + 10 V or 0 to –10 V DC
v.	Threshold for acquisition	40 dB-Hz C/N0 minimum for acquisition
vi.	AFC	+/- 300 kHz
vii.	I/P connector	SMA/N type female, 50 Ohms
viii.	O/P connector	Suitable to feed to the offered Antenna Control Unit
ix.	Remote Interface	RS 232 or RS 485/ 422 or via RJ 45 Ethernet

5.4 Specification for LNA System

A. Essential Features:

(i) The LNA System should be in (2+1) redundant configuration.

(ii) This LNA is for C Band operation and is to be mounted directly on the feed with transmit reject filter.

(iii) Two Low loss cables (1/2"corrugated copper outer and copper or copper clad Aluminum inner conductor similar to Andrew LDF4-50A or RFS ICA12-50JPL cables) (having loss below 18 dB at 4 GHz for a cable length of 100 meters) for connecting both LNA output to the indoor electronics is to be supplied with the system.

B. Technical Specifications:

S.No.	Description	Requirement
i.	Frequency Band	3.7 GHz to 4.2 GHz
ii.	Gain	55 dB minimum
iii.	Gain flatness	(a) 0.5 dB p-p over 40 MHz (Max) (b) 2.0 dB p-p over Full bandwidth(Max)
iv.	Gain stability (with respect to Time at Constant Temperature)	(a) ± 0.1 dB/ hr (maximum) (b) ± 0.2dB/ 24 hr (maximum)
v.	Input wave guide	CPR 229 G
vi.	Input /output VSWR	1.3: 1 Input (Max.) 1.5: 1 Output (Max.)
vii.	AM/PM conversion	0.05°/dB (maximum) at -5 dBm
viii.	Group delay (Over 40 MHz Frequency range)	(a) Linear 0.01 ns/MHz maximum (b) Parabolic 0.001 ns/MHz^2 maximum (c) Ripple 0.1 ns p-p maximum
ix.	Maximum input power (without damage) (Input Overdrive)	0 dBm
x.	Level @1dBcompression (P1dB)	+10dBm
xi.	Third Order Output Intercept Point	20 dBm minimum
xii.	Output connector	N type Female
xiii.	Power supply	DC: + 12 V to 24 V
xiv.	Noise Temperature at 23° C	30° K
xv.	Power connection	The supply should be given through a separate cable to the LNA through LNA controller installed in Earth Station

5.5 Technical Specifications for Elliptical Waveguide

S. No	Description	Specifications
i.	Conductor Material	Corrugated Copper
ii.	Operating Frequency Band	5.85 GHz - 6.425 GHz
iii.	Cut-off frequency	3.65 GHz
iv.	VSWR	≤1.15 dB at full freq. range
v.	Attenuation at 6 GHz	≤ 4.0 dB/100 m
vi.	Weight	1.1 Kg/m (maximum)

5.6 Dehydrator

1. A de-hydrating arrangement should be offered with the antenna system. Dehydrator should be regenerative and should be able to provide suitable pressure to waveguide run (existing + new, from HPA system upto UPLINK PDA).
2. It should be rugged in construction and capable to handle the extreme climatic conditions.
3. The offered Automatic Dehydrator (Pressurization system) should have the provision for various alarms & indicators and safety valves.
4. Dehydrator, with required accessories, 3-5 PSI (user configurable) should be offered by the bidder.
5. Minimum required alarms, indications and safety requirement: Low pressure alarm, High pressure alarm, Pressure gauge, Adjustable pressure, High pressure safety release valve.

5.7 Specifications for UPS, Battery

Bidder will have to supply, install, test and commission the 2x20 KVA UPS including battery system as per timeline given below::

S.No.	UPS for the Station	To be delivered after the issue of A/T
1	Chennai, Kolkata, Thiruvananthapuram, Shimla and Jammu	Within 8 months from the date of issue of purchase order.
2	Ahmedabad, Bhubaneswar, Lucknow, Jallandhar, Jaipur and Bhopal	Within 10 months from the date of issue of purchase order

5.7.1 General Features of UPS:

1	a) The UPS system should be fully DSP controlled in all respects (i.e. rectifier control, inverter control, display, digital diagnostics.), solid-state type, utilizing On Line Double Conversion technology (high frequency PWM using IGBT Rectifier & inverter section) b) The UPS system should be capable of providing continuous high quality sinusoidal waveform power for electronic equipment loads. c) The UPS system should conform to voltage frequency independent technology.
2	The DSP based controller should have following characteristics: a) Diagnostic monitoring achieved by Fast Fourier Transform (FFT) of spectrum analysis b) Adaptive control by having the speed to monitor and control the system concurrently c) Real time generation of smooth, near optimal reference profiles and move trajectories

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	d) Control power switching and inverters and generate high resolution outputs.
3	The UPS should offer low input current harmonic distortion (THDI), good regulation, excellent transient response and high stability.
4	a) The UPS system should have a monitoring panel (LCD Based) with various types of fault alarms and metering functions including: i. Output voltage, current & frequency. ii. Input voltage, current & frequency. iii. Bypass Voltage, Current & frequency. iv. Battery capacity, backup time left & bad battery indication. v. Temperature of System, Inverter section and Rectifier section. b) The UPS system should display RMS value of load current. c) The UPS system should have facility to generate aural and visual alarm for bad Battery condition.
5	a) The UPS system should have wide input voltage and input frequency tolerance as specified in Rectifier section. b) In built Transient Voltage Surge Suppressor (TVSS) should be provided at the input of the UPS System.
6	The UPS system should have provision for controlling all the three phases individually, even in case of 100% unbalancing at the output with even 0% load on one phase.
7	In case of failure of parallel operation, automatic and manual override for the system to work in 1+1 hot standby should be available. (Firm should enclose single line diagram of mains changeover panel).
8	The UPS system should be capable of supplying energy to load from commercial mains without any break in case of phase reversal at the input. It should also generate aural and visual alarm in such a case.
9	a) The system should have provision of protection for (i) Input under voltage (ii) Input Over Voltage (iii) Output Over Voltage (iv) Output Over load (v) Output short circuit (vi) Battery under Voltage (vii) Over temperature (viii) DC Over current b) The system should generate aural and visual alarms for above-mentioned conditions.
10	The UPS system should have Controls as (i) Input Circuit Breaker (ii) Bypass Circuit Breaker (iii) Maintenance Bypass Switch (iv) Inverter ON / OFF Switch (v) Alarm acknowledge switch
11	a) The system should have facility to store the Logs of the events being monitored by monitoring system.

	b) The UPS system should have the capability to store a minimum of last 100 events. c) The UPS should have in – built digital fault diagnostic through stored events in UPS system.
12	a) The firm should specify the nos. & type of desired batteries, which shall be part of the system to be offered. [The batteries of known &reputed world –class manufacturer will only be accepted.] The maintenance free-batteries VRLA type shall only be acceptable. The detailed technical specification of batteries with their working life is also to be specified and provided with the offer. b) The firm should also provide battery changeover unit for battery banks so that any bank can be connected to any UPS system.
13	The battery charger should have provision of (i) Monitoring battery temperature and accordingly adjusting the charging level to enhance the battery life. (ii) Programmable battery charging which can be programmed to enhance battery life.
14	The UPS system should have communication port RS 232 and should be compatible to integrate with NMS. Suitable software for monitoring & diagnostics etc. should be supplied.
15	The UPS system should be designed with scientific forced air-cooling for proper ventilation. Acoustic noise level should be kept at minimum.
16	The UPS system output should be isolated from the DC circuit of the UPS.
17	The UPS system quoted must conform to the latest international standards of safety and EMC. The conformance to such standards (indicating standard's name & number) must be stated in compliance statement. A certificate issued to OEM by authorized international/ national agencies should be submitted along-with the declaration from OEM in this regard. In general, following standards should be met: - a) Safety: IEC 62040-1 / EN 50091-1 b) Emission and Immunity: IEC 62040-2, Class A / EN 50091-2 (Class A) c) Performance: IEC 62040 –3/ EN 50091 – 3 d) CE-Marked in accordance with EEC directives 73/23 "low voltage" and 89/336 "electromagnetic compatibility"
18	The UPS manufacturer must be ISO 9001-2000 certified company. A copy of the certificate should be enclosed with the offer.

5.7.2 Operational Features and Technology of UPS

1) Technology: The UPS shall be designed to operate as **true on-line, double conversion DSP controlled type UPS** strictly as per the definition of IEC 62040-3 as follows:

a) Normal Operation:

The UPS inverter should continuously supply the critical AC load. The rectifier & charger should take power from the AC input source, convert it to suitable DC and supply to the inverter as well as charge the Batteries on Automatic Float cum Boost Mode.

b) Upon Mains Failure:

Upon failure of AC input power, the critical AC load should continue to be supplied by the inverter, which should obtain power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the AC input source (Mains/ DG).

c) Upon Mains Restoration:

Upon restoration of AC input power, the Rectifier/Charger should automatically restart walk-in and gradually take-over the supply to inverter and charging to the battery.

d) Static Bypass:

Each UPS Module should have in-built 100% rated static Bypass Line. In two UPS Modules connected in parallel redundant Current Sharing Mode, in the event of any fault in one UPS, the faulty UPS should isolate itself and the healthy UPS, which normally shares the load 50%, should take-over the full load.

All the loads should be transferred to the Static Bypass Line of the UPS without any break if the input frequency is within 50 Hz and with a break below 20 milliseconds if the input frequency is beyond 50 Hz for the following conditions:

i. If both the UPS fails simultaneously
ii. If overload beyond 150% for 1 minute is faced by the UPS
iii. If both UPS sense over temperature (i.e. inverter exceeding 85 Deg Celsius simultaneously).

If both the UPS inverters are put-off

2	MTBF of the System:	Minimum 150000 Hrs
3	Capacity:	20 KVA at power factor 0.9
4	Overall Efficiency: (From I/P to O/P of the U.P.S. system)	>94% (for all loads from 50% to 100%)

5.7.3 Feature of Rectifier Section of UPS

1.	**Technology**	DSP Controlled IGBT Rectifier to reduce the harmonics.
2.	Input	3-phase, 4-wire plus Ground
3.	Input Voltage	320 to 475 V (at full load)
4.	Input Frequency	47 – 53 Hz

5.	Input Power factor	≥0.99
6.	Input Current Harmonic Distortion (THDi)	≤ 3%
7	Soft start (0-100%)	> 10 Sec
Note: Bidder should Specify the following Parameters for quoted UPS system		
	i) Rectifier Input current (Max.)	
	ii) Max. Rectifier output current	
	iii) Rated Output current (with battery in fully charged state)	
	iv) Max. Output Voltage	

	5.7.4 Feature of Inverter of UPS:	
1.	Technology	Fully DSP based IGBT/IPM Inverter
2.	Output Voltage a) Nominal: b) Static:	3-phase, 4-wire plus Ground 380V - 415V AC (adjustable), 50Hz 400 ± 1% V AC, 50Hz
3.	Output voltage regulation: a) 100% Balanced load b) 100% Unbalanced load c) Transient response (100% step loading) d) Recovery time to steady state (± 1%)	± 1% ± 2% < 5% < 5 msec.
4.	Output frequency regulation a) Sync Connection: b) Self Connection:	± 1% (meeting input frequency range of 47-53 Hz.) ± 0.05%
5.	Output voltage Distortion: (at rated load)	< 1% linear load, <3% non-linear load with **3:1 crest factor**
6.	Audible noise level at 1 meter	58 dBA or better
7.	Overload capacity: (a) Inverter (b) Bypass Mode	Upto 110% --10 min, Upto 133% --1 min Upto 110% continuously at rated current 110% to 150% 10 min > 150% 2 seconds
8.	RF Suppressions:	As per BIS & EMC standard.
9.	Computer Interface:	RS 232 Interface
10.	On– Line Battery testing:	Required
11.	(a) Mains failure,	Bidder to provide Audio/Visual

	(b) Battery Low, (c) UPS Fault	alarm at remote location.
12.	Front panel Display (Please submit the details of front panel display)	LED mimic with LCD display. The LCD should display the following: a) Input side: i) Voltage ii) Current iii) Frequency b) Output side: i) Voltage ii) Current (RMS value) iii) Frequency c) Intermediate DC: i) Voltage ii) Current iii) Remaining time (in minutes) d) Bypass: i) Voltage ii) Current iii) Frequency e) Alarm History
	Note: Bidder should Specify the following parameters for quoted UPS system i) Total system losses at nominal load (with charged battery) ii) Size of LCD panel for monitoring should be 50 x 100 mm minimum	
	5.7.5 Battery Bank / Battery of UPS System	
	The bidder should submit battery sizing calculation from Battery OEM justifying following points: • No. of Cells • Capacity of Cell (Ah), (By considering the K factor, efficiency of system, Temperature correction factor, Ageing correction factor, etc.) • DC bus voltage • Minimum surface area required for installation of battery bank	
1.	Battery Bank Capacity	Minimum 18000 VAH (for each UPS)
2.	Nominal output current capacity	Minimum 42 AH
3.	No. of Battery String	1 no. for each Battery Bank (one battery bank with each UPS)
4.	DC Voltage of the battery bank	Should be Minimum 360 V
5.	Type:	12 V cells of Maintenance Free **Valve Regulated Lead Acid (VRLA).** (Please submit the catalogue of offered

		battery) with its detailed specifications along with the charging & discharging characteristics (Graphs from the OEM).
6.	Backup time:	Minimum 15 minutes (at the End of Life (EOL) of Battery) for 100 % load with each UPS system
7.	Charging Voltage	Float: 2.23-2.27 V per Cell at 27°C
8.	Cutoff Voltage	1.70-1.75 V per Cell (should be Selectable)
9.	Floating Voltage regulation between no load & full load.	< 2% or better
10.	CODES & STANDARDS	The supplying battery manufacturer shall be ISO 9001/14001 certified. The battery design shall be of proven technology. The manufacturer shall have 5 years of field experience. ISO-9001/14001 Certificate Copy for 'VRLA Battery' must be attached with the offer.
11.	DESIGN	All cells within the battery string shall be of the same manufacturer and model. The cells shall be "valve-regulated" (maintenance free) type.
12.	Life	4 Years minimum designed life at 27 degrees C on full float.
13.	Life Cycling Characteristics	Each battery shall be designed to provide 1700 cycles at 20% depth of discharge (DOD) at 27 degrees C and 400 cycles at 80% DOD at 27 degrees C.
14.	Recharge Rate	The battery shall be capable of a 90% recharge within 12 hours.
15.	Operating Temperatures and Altitude	The battery shall be capable of operating in temperatures ranging from 0°C to +40°C. Battery shall withstand hard freezing without damage to the alloy, plates, or cell container assembly. The battery shall be capable of operating at a maximum of 2000m from ground level (AMSL).
16.	Gassing	No special ventilation shall be required under normal operating conditions. No specialized "battery room" shall be required to house the battery unit.
17.	Battery Orientation	Battery shall have front or Top

		accessible terminals with clear removable covers to facilitate visual inspections and allow ease of service.
18.	Self-Discharge	The battery shall have a maximum self-discharge rate of 0.5-1.0% per week at 27°C.
19.	Housing	The Battery system should be installed & supplied with M S Racks (stand).
20.	Product Identification Label	Each battery shall have a self-adhering label identifying the product manufacturer, model and nominal Amp/Hour capacity. The label must be readily visible from the front of the battery. The label shall not wear out throughout the life of the battery.
21.	Capacity Testing	Each cell shall be capacity tested at the manufacturing facility as per standard battery testing procedure. For each battery, battery performance tables and curves shall be submitted with the supply. The curves may be obtained by test or by calculation.
22.	Leak Detection	Integrity of the container and post seals shall be verified in the cell manufacturing process using an automated helium leak detection process.
23.	Seismic Requirements	Cells shall be packaged in steel modules that meet Seismic requirements when stacked horizontally.
24.	Accessories	Each battery shall be furnished with the following accessories: 1. Each battery system shall include the necessary inter-module connectors and terminal plates. The connectors shall be lead-tin plated copper and shall include stainless steel hardware. 2. Assembly and connection drawings. 3. Each module shall include an easily removable transparent "snap on" safety shield to cover all connectors.

6. Physical, Environmental & Mechanical Specifications

The following specifications are to be followed if not mentioned elsewhere in this document.

6.1 Power Supply

Equipment shall operate from a wide range of power supply voltages without interruption or damage.

Parameter		Specification
(a) Voltage Range	:	220/240 V AC nominal
(b) Frequency	:	48-52 Hz

6.2 Environmental Specifications

Parameter		Specification
(a) Operating Temperature (Indoor)	:	0°C to 45°C
(b) Operating Temperature (Outdoor door)	:	- 10°C to 50°C
(c) Storage Temperature	:	- 20°C to 60°C
(d) Humidity (Indoor)	:	0 to 85% non- condensing
(e) Humidity (Outdoor)	:	0 to 100%
(f) Altitude	:	0 to 2000 m

6.3 Mechanical Specifications

Indoor equipment shall be rack mounted.

Parameter	Specification
(a) Construction	Modular approach, EIA RS-310C, 19" rack-mount

7 Complement of Equipment for the Earth Station:

7.1 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).

7.2 The suggestive Bill of Material (BOM) has been provided in **Annexure-I**. The bidder is required to provide the complete list of equipment, software and accessories etc. 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 is liable to be rejected summarily. The following is the Proforma for the BOM:

Sl. No.	Description of Item as per Specification (Suggestive BOM)	Description of Item as offered by the Bidder	Qty. per site	Total Quantity as per Suggestive BOM	Make	Model
1	2	3	4	5	6	7

7.3 Any substandard equipment included in the offer may result into the rejection of complete offer with the sole responsibility of bidder.

7.4 The offer should also include the detailed technical brochure and technical manual containing all the technical specifications of all the offered equipment, accessories, and software etc.

7.5 General specifications applicable to all equipment wherever applicable have been given in Clause No. 5.

8 General

8.1 Compliance and Authorization:-

8.1.1 The bidder must submit a point-by-point compliance statement in respect of all the points, sub-points and paras laid down in this specification from page 1 onwards along with the offer.

8.1.2 In addition to the above, compliance from respective OEMs (not from representatives) in respect of all the equipments listed below should necessarily be given on their letter heads, with reference to the points, sub-points and paras laid down in the technical specifications of respective equipment.

8.1.2.1 UPLINK PDA, BUC, Feed, LNA, BUC, Dehydrator

8.1.2.2 UPS System including Battery Bank. (OEM of UPS may submit compliance, authorization, Guarantee/ Warranty and after sale support of the complete UPS system including Battery bank).

8.1.3 The OEM's authorization (not from representative) in respect of all the Equipments listed under Sr. No. 8.1.2 should also be given on their letter heads along with bid. As per Annexure II.

8.1.4 Mere signature on a copy of Doordarshan specifications shall not be accepted as a compliance statement.

Compliance statement in the format as indicated below shall only be accepted.

Sr. No. of DD specs.	DD Specs.	Compliance (Yes/No)	Performance fig. of equipment offered.	Deviations, in case of non-compliance	Optional items if any required to make the system Compliant to DD specs.	Features in the system offered Which exceed DD specs.	Page No.	Remarks
1								
2								
3								
4								

8.1.5 The manufacturer should also record the performance figures of the equipment offered in the quote for which the compliance statement is enclosed.

8.1.6 The compliance statement should be supported by highlighted record of these in the technical literature/data sheets enclosed with the tender and a clear reference to the attached supporting document should be given in the remarks column against each & every specs. Any offer without proper supporting document of each & every specs and containing only a commercial hand out/pamphlet is liable to be rejected.

8.1.7 Data sheets should be submitted in respect of all offered equipment. Any deviation from the specification detailed in the compliance statement is to be highlighted separately. Page no. or location of data sheet should be given in page no. column above.

8.1.8 Offers without proper & duly completed compliance statement are likely to be rejected with the sole responsibility of bidder and no further claim/ correspondence will be entertained.

8.2 Documentation

8.2.1 One set of technical manuals for all the equipment are to be provided along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored.

8.2.2 The successful bidder will have to supply set of printed technical manuals along with factory test report of all the offered equipment.

8.2.3 Technical Manual for all equipments should also be supplied on CD/DVDs with search facility.

8.2.4 All offered software should have perpetual validity and should be in the name of Doordarshan. All software backups should also be supplied on CD/DVDs.

8.2.5 The successful bidder must submit the firm's self certified copies of import licenses at the time of commissioning in respect of RF equipment for issuance of operating license for WPC.

a) For facilitating maintenance issues, the bidder must submit the firm's self certified copies of Bill of Entry/Bill of Laden/Custom Invoice of all imported items to DG:DD at the time of release of PBG.
b) The successful bidder must ensure that all Invoices bear serial numbers of equipment to meet the requirement of WPC.
c) The successful bidder will be required to print and display the final Technical Block diagram and Line diagrams of Antenna and Power supply chain in the technical area of the concerned Kendra after completion of the installation.

8.3 Guarantee

8.3.1 All the offered equipment shall be guaranteed against any manufacturing defect for a period of **3 (THREE)** years from the date of Commissioning.

8.3.2 Any part failing during the guarantee period shall be repaired/replaced free of charge by the successful bidder at site. For repairing of any defective equipment during guarantee period, the defective module or equipment requiring repairs will be handed over to local office/local authorized representative/ dealer who will arrange repairs locally at site or send/export the defective modules to OEM factory and re-import/send back after repairs.

8.3.3 It is the responsibility of local office/ Authorized representative/ dealer of the bidder to arrange the repair/ replacement of faulty items for Doordarshan i.e. no transportation charges would be paid by DD for transporting the defective/ repaired items, if required to be removed from site, during the guarantee period.

8.3.4 Guarantee period is to be extended corresponding to the outage period if the failure rectification takes more than 15 working days time.

8.3.5 Bidder shall provide the guarantee/ warrantee in respect of the equipment as mentioned in Clause 8.1.2 through respective OEMs. ***A certificate, duly signed by the OEM on the OEM letterhead, in this regard of the respective equipment must be submitted with the offer by the bidder.*** *As per Annexure III*

8.3.6 After sales service support for additional 2 (TWO) years for the repairs/ maintenance of Earth Station equipment after the completion of guarantee/ warrantee period shall also be provided by the OEM of the Earth Station equipment either directly or through his representative in India. In this regard a certificate, duly signed by the OEM on the letterhead, must be submitted with the offer by the bidder. As per Annexure IV.

8.4 Inspection and Commissioning:

8.4.1 All the equipment to be supplied against the supply order for this tender shall be subjected to pre-dispatch inspection before the commencement of the installation at bidder's premises/Delhi or at site by Doordarshan. The successful bidder should produce the factory test reports of all the offered equipment to facilitate inspection.

8.4.2 Post installation inspection of the system will be carried out by a team of Doordarshan Officers authorized by Doordarshan Directorate and based on approved Acceptance Test Procedure (ATP).

8.4.3 A draft copy of ATP (Acceptance Test Procedure) must be submitted by the bidder one month in advance of the proposed date of inspection of system to Doordarshan Directorate for approval. ATP should describe the standard test procedure of individual equipment and of the integrated system chain. The factory test report will not be treated as ATP.

8.4.4 The accepted ATP / approved ATP with or without changes shall be sent back to the successful bidder which will be used for inspection and commissioning of ES equipments by DD Engineer(s) at site. All the equipment required for the inspection as per the approved ATP are to be provided by the successful bidder.

8.4.5 The SITC certificate will be issued by the team of Officers appointed at S.N. **8.4.2** above.

8.5 Delivery Period

A. Delivery Period for Uplink Antenna System

S.No.	Uplink Antenna System for the DDK's	To be delivered
1	Chandigarh, Chennai, Kolkata and Thiruvananthapuram	Within 8 months from the date of issue of purchase order or 8 months from the date of the decision letter from WPC provided by DD in respect of RF equipment, whichever is later.
2	Ahmedabad, Bhubaneswar and Lucknow	Within 10 months from the date of issue of purchase order or 10 months from the date of the decision letter from WPC provided by DD in respect of RF equipment, whichever is later.

B. Delivery Period for UPS System including Battery Bank

S.No.	UPS System for the DDK's	To be delivered After the issue of A/T
1	Chennai, Kolkata, Thiruvananthapuram, Shimla and Jammu	Within 8 months from the date of issue of A/T
2	Ahmedabad, Bhubaneswar Lucknow, Jallandhar Jaipur, and Bhopal	Within 10 months from the date of issue of A/T.

8.6 Pre-bid Conference

8.6.1 A pre bid conference on technical Specifications and other issues shall be held on date and time specified in the NIT. All prospective bidders may attend the pre bid conference to discuss their queries and suggestions.

8.6.2 All the queries and suggestions should be sent to Doordarshan at least 2 days before the date of pre bid conference. No queries/ suggestions shall be entertained after pre bid conference.

8.6.3 Amendments subsequent to the pre bid conference shall be sent to prospective bidders, who have purchased tender document, by e-mail/fax/ post.

8.6.4 It shall be bidder's responsibility to check for any amendments/addendum on the website before submitting their duly completed bids.

8.7 Check List and Enclosures

8.7.1 The bidders may ensure the following check list while submitting the bid including some important list of enclosures for ease of technical evaluation. As per Annexure-V

8.7.2 Whether documents related to fulfilment of the eligibility criteria as per Clause 3 have been submitted.

8.7.3 Whether point-by-point compliance statement of the bidder in respect of all the points, sub-points and Paras laid down in this specification from page 1 onwards along with the offer as given in Clause 8.1.1 has been included.

8.7.4 Whether point-by-point compliance statement of OEM in respect of all the points, sub-points and Paras laid down in the specification of respective equipment and their authorization mentioned in Clause 8.1.2 & 8.1.3 have been included. Authorization and Compliance Statement from OEMs will only be acceptable and not from the authorized dealer of the OEMs.

8.7.5 Whether the Compliance has been submitted in the prescribed format as given in Clause 8.1.5.

8.7.6 Ensure that all equipment and accessories as given in the Suggestive bill of material have been included in the offered BOM.

8.7.7 Whether the page numbers of the relevant enclosed technical data sheet/manual against each parameter of the specifications have been given in the compliance statements.

8.7.8 Whether the requisite undertakings for after sales support by OEMs and bidder have been submitted.

8.7.9 Ensure that no alternate item has been offered.

8.7.10 Ensure that the relevant technical brochures containing all the parameters of technical specifications of all the offered equipment and accessories have been included with proper indexing for ease of identification.

8.7.11 Ensure that the Un-priced BOM has been included.

8.7.12 Any other item mentioned elsewhere in the tender.

Annexure-I

SUGGESTIVE BILL OF MATERIAL

SITC of Antenna for Earth Station-7 Locations

(Ahmedabad, Kolkata, Bhubaneswar, Thirunanathapuram, Chennai, Lucknow, and Chandigarh) and

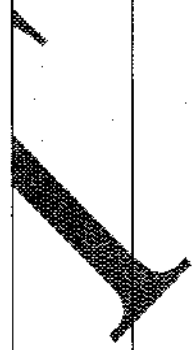
SITC of UPS and Waveguides, Earthings etc. for Earth Station-11 Locations

(Jalandhar, Shimla, Ahmedabad, Bhopal, Bhubaneswar, Chennai, Jaipur, Jammu, Kolkata, Lucknow, and Thirunanathapuram)

(Bidders must submit BOM as per Proforma given in Clause 7)

Sr. No.	Description of Item as per Specification (Suggestive BOM)	Description of Item as offered by Bidder	Qty. per site	Total Qty.	Make	Model	Remark
A.	**Uplink Antenna and accessories**						
1	7.3-7.6 meter motorized Up link antenna (UPLINK PDA)		1 No.	7 Nos.			
2	Automatic antenna control unit for quick orientation of the above UPLINK PDA		1 No.	7 Nos.			
3	C-Band Beacon Tracking Receiver		1 No.	7 Nos.			
4	C-Band 4 Port Linear polarized feed (motorized)		1 No.	7 Nos.			
5	Trans reject filter/ Diplexer for above feed (if required)		1 No.	7 Nos.			
6	40 dB Cross guide coupler		1 No.	7 Nos.			
7	Bird Guard for feed		1 No.	7 Nos.			
8	C-Band LNA in 2+1 configuration along-with Power Supply cable and LNA Controller for H&V receive port.		1 Set	7 Nos.			
9	Low loss RF cable as per site requirement (to Connect LNA O/P to Down converter) of ½" foam or PE Dielectric, corrugated copper outer and copper or copper clad aluminum inner conductor) (Minimum length 2x50=100 meter) (Rates to be quoted per meter basis)		100 Meters	700 Meters			
10	Low loss RF cable as per site requirement (to Connect Directional Coupler output in each port to the HPA Room) of 1/2" foam or PE		100 Meters	700 Meters			

	Dielectric, corrugated copper outer and copper or copper clad aluminum inner conductor) (Minimum length 2x50=100 meter) (Rates to be quoted per meter basis)						
11	UPLINK PDA foundation having platform of 100 cm from the ground (material and labour)		1 Lot	5 Lots			
12	UPLINK PDA foundation having platform of 200 cm from the ground (material and labour)		1 Lot	1 Lot			
12	UPLINK PDA foundation having platform of on the rooftop of the building (material & labour)		1 Lot	1 Lot			
13	Suitable ladder and platform arrangement from the OEM of the antenna		1 Lot	7 Lots			
14	Lightning Arrestor for UPLINK PDA		1 Lot	7 Lots			
15	NOCC clearance of the installed Uplink Antena		1 Lot	7 Lots			
16	Elliptical (semi-rigid) waveguide to energize the UPLINK PDA for one uplink port) (as per site requirement. Rates to be quoted per meter basis)		40 Meters	280 Meters			
17	Suitable waveguide connector for connecting the Elliptical waveguide at both ends having CPR 137 G/F flange with gasket and screw kit and Pressure window at both ends.		2 Sets	14 Sets			
18	Flexible twistable waveguide of 1 meter length having CPR 137 G/F Flange with gasket and screw kit		2 Sets	14 Sets			
19	Flexible twistable waveguide of One meter length having CPR 229 G/F Flange with gasket and screw kit		2 Sets	14 Sets			
20	Waveguide & Cable support tray with cover (as per site condition) between UPLINK PDA to Earth Station Room (as per site condition) (minimum length 30 Meter)		1 Lot	7 Lots			
21	Suitable electrical cable between earth station to ODU (two lengths)		1 lot	7 lots			
22	Directional couplers for both transmit ports		2 Nos.	14 Nos.			

23	Automatic Dehydrator (3-5 PSI user configurable) with required accessories and front panel display with remote access through Ethernet/SNMP etc and rack mounting kit.		1 Lot	7 Lots			
24	Essential item (if any)to complete the installation of Uplink Antenna system		1 Lot	7 Lots			
B.	**Power Supply System**						
25	2x20KVA IGBT/PWM based (Rectifier & Inverter), Fully DSP based Double Conversion UPS system, connected in Redundant Parallel Configuration. (3 Phase input-3 Phase Output) [Including Transient Voltage Surge Suppressor (TVSS) in input & output. (ANSI/ IEEE C62.41 1991 C1 (6KV @ 3KA))]		1 Set	11 Sets			
26	Maintenance Free 12V, VRLA type Battery Bank suitable to provide 15 minutes (minimum) backup (EOL) with each UPS system to provide combined backup of 30 minutes, as per tender specification. (Minimum Battery Capacity: 18000VAH minimum)x2. Calculation sheet with following details to be provided with the bid.		1 Set	11 Sets			
	DC_Voltage:						
	Battery_Capacity:						
	No. of Batteries with each UPS:						
27	Battery Changeover Unit (including all the associated cables and components) to cross-connect Battery banks with UPS		1 Set	11 Sets			
28	Remote panel with interface cables (minimum length 30 meter) for monitoring of UPS system in Control Room		1 Set	11 Sets			
29	Essential item (if any)to complete the installation of UPS system		1 Lot	11 Lots			
C.	**Earthing**						
30	Earth pits should consist of Copper Earth electrode (diameter 20 mm (min)), insulated copper strip/wire						

	(50 Sq. mm (Min)), Chemical earth fill compound with fast discharge characteristics, water absorbing gel, perforated Hard HDPE pipe (diameter 40 mm (min)), funnel, water supply provision up to each earth pit (preferably from A/c condenser), 10 feet depth (min) and 1 feet diameter (min.). Earth pit should be prepared so that earth resistance is less than 1 ohm as per following :						
30a	a) **2 nos.** for UPS each with less than 1 ohm resistance		1 Lot	11 Lots			
30b	a) **2 nos. for UPLINK PDA** each with less than 1 ohm resistance)		1 Lot	7 Lots			
D.	**WAVEGUIDE**						
31	C-Band, 90 degree rigid waveguide **H-plane bend** with CPR 137F/G Flange connector (Length-300mm max (each leg)).		1 No.	11 Nos.			
32	C-Band, 90 degree rigid waveguide **E-plane bend** with CPR 137F/G Flange connector (Length-300mm max (each leg)).		1 No.	11 Nos.			
33	Cross Guide Directional Coupler for Frequency range 5.85 to 6.425 GHz with CPR 137 F/G Flange connector		2 Nos.	22 Nos.			
34	C-Band, Twisted rigid waveguide, clockwise with CPR 137 F/G Flange connector (Length-300mm max).		2 Nos.	22 Nos			
35	Supply of Flexible Waveguide with CPR 137G Flange connector at one end and CPR 137F Flange connector at other end with gasket and screw kit. **Length-0.6 mtr**		2 Sets	22 sets			
36	Supply of Flexible Waveguide with CPR 137G Flange connector at one end and CPR 137F Flange connector at other end with gasket and screw kit. **Length 1.0 mtr**		2 Sets	22 Sets			
37	Supply of Flexible Waveguide with CPR 137 F/G Flange connector with gasket and screw kit. **Length-0.6 mtr**		2 Sets	22 Sets			

38	Supply of Flexible Waveguide with CPR 137 F/G Flange connector with gasket and screw kit. **Length 1.0 mtr**		2 Sets	22 Sets			
E.	**Training**						
39	(a) In India: Two days on site training including Theoretical (along with basic study material) & Practical training (hands on experience) on uplink antenna system for Doordarshan personnel at each site. (Note: Training will not be treated as part of the delivery period)		1 Lot	1 Lot			
39	(b) In India: One day on site training including Theoretical (along with basic study material) & Practical training (hands on experience) on UPS for Doordarshan personnel at each site. (Note: Training will not be treated as part of the delivery period)		1 Lot	1 Lot			
F.	**Documentation**						
	Equipment manuals consisting of:						
40	Operation/User Manual and installation manual, Test Reports Hard copy and Soft copy on CDs with Search facility for all the supplied equipment. (2 Sets to be supplied at each 11 ES Kendras for UPS-Battery Bank System & 2 Sets to be supplied at each 7 ES Kendras for Uplink Antenna System, 1 Set to be supplied at DG: DD and 1 Set to be supplied at each zonal office ADG(NZ), ADG(SZ), ADG(EZ), ADG(WZ)).		1 Lot	1 Lot			
41	All software backups are to be supplied on CDs. (2 Sets to be supplied at each 11 ES Kendras for UPS-Battery Bank System & 2 Sets to be supplied at each 7 ES Kendras for Uplink Antenna System, 1 Set to be supplied at DG: DD and 1 Set to be supplied at each zonal office ADG(NZ), ADG(SZ), ADG(EZ),		1 Lot	1 Lot			

	ADG(WZ)).						
42	Firm's self certified copies of import license in respect of RF Equipment HPA system etc. for issuance of operating license from WPC. – 4 Sets for each site		1 Lot	1 Lot			
G	**Installation, Testing and Commissioning**						
43	a)Installation, testing and Commissioning of the antenna system at various sites i. Chandigarh, Chennai, Kolkata and Thiruvananthapuram ii. ii. Ahmedabad, Bhubaneswar and Lucknow		1 Lot	7 Lot	-		
	Installation, testing and Commissioning of the UPS system at various sites iii. Chennai, Kolkata, Shimla, Thiruvananthapuram, and Jammu iv. Ahmedabad, Bhubaneswar Lucknow, Jallandhar Jaipur, and Bhopal		1 Lot	11 Lot			

Annexure-II

OEM'S LETTER HEAD

CERTIFICATE FOR AUTHORIZATION

Date:

Tender No. :

We, M/s ..... (Name and Address of the OEM), do hereby authorize M/s..... (Bidder's name), having its office at ..... (Bidder's address) to submit the bid and sign the contract with Doordarshan for the products offered by us against the above tender.

Signature .....
Name & Designation of authorized signatory.....
Name of the OEM .....
Stamp of OEM

Annexure-III

RESPECTIVE OEM's LETTER HEAD

CERTIFICATE FOR GUARANTEE

Date:

Tender No. :

We, M/s ..... (Name and address of the OEM), do hereby confirm that:

1. The offered ---------- System shall be guaranteed for satisfactory working without any fault and defect for three years from the date of receipt of last accepted consignment.
2. Any defect or failure of any module/equipment during the guarantee period shall be repaired/replaced free of charge by the successful bidder at site. For repairing of any defective module/equipment during guarantee period, the defective module or equipment requiring repairs will be handed over to M/s .....<Name of local office/local authorized representative/dealer> who will arrange repairs locally at site or send/export the defective module to our factory and re-import/send back after repairs.
3. It is the responsibility of M/s .....<Name of local office/local authorized representative/dealer> to arrange the repair/ replacement of faulty items for Doordarshan i.e. transportation charges are not to be paid by DD for transporting the defective/ repaired items, if required to be removed from site, during the guarantee period.
4. Guarantee period of the equipment would be extended corresponding to the outage period if the fault rectification takes more than 15 days time.
5. After sales service support for additional 2 (TWO) years for the repairs/maintenance of supplied equipment after the completion of guarantee/warrantee period shall also be provided by M/s .....<Name of the OEM of the respective System > either directly or through M/s .....<Name of OEM's representative in India>. In this regard a certificate, duly signed by the OEM on the letterhead, must be submitted with the offer by the bidder.
6. All offered software will be licensed to Doordarshan on perpetual basis without specifying any time limit or without specifying end of life of the software. Software upgrades within warranty period will be supplied free of cost

Signature .....
Name & Designation of authorized signatory.....
Name of the OEM - .....
Stamp of the OEM

Annexure-IV

OEM LETTER HEAD

CERTIFICATE FOR AFTER SALES SERVICE SUPPORT

Date:

Tender No. :

We, M/s ..... (Name and address of the OEM), do hereby confirm that after sales service support for additional Two (2) years for the repairs/maintenance of offered products after the completion of three (3) Years guarantee/ warrantee period shall be provided through our representatives/authorized dealer/service provider for the offered equipment and accessories in India as mentioned below:

S. No.	Name of the authorized person	After Sales Service support office address	Telephone/ Fax	Email of concerned personnel
1				

Signature .....
Name & Designation of authorized signatory.....
Name of the OEM .....
Stamp of the OEM

Annexure-V

BIDDER LETTER HEAD

DECLARATION BY THE BIDDER

1. Bill of Material (BOM)- : [Yes/No]
2. Bidder's compliance (As per specs clause no. 8.1.1) : [Yes/No]
3. The copy of Dealer Possession License in case of possession of RF equipment (as per clause no. 3.5) : [Yes/No]
4. Copy of the Memorandum of Understanding (MOU) (if any) of partnership (as per clause no. 3.3) : [Yes/No]

5. OEM Compliance for following equipment from their respective OEMs (as per clause no. 8.1.2):

S. No.	Name of equipment	Name of OEM	OEM compliance submitted (Yes/ No)
i.	7.3 – 7.6 meter Uplink Antenna System (UPLINK PDA, Feed, LNA, BTR, ACU, and Dehydrator)		
ii.	2x20 KVA UPS including Battery Bank		

6. Certificate for authorization for following equipment from their respective OEMs:

S.No.	Name of equipment	Name of OEM	Authorization certificate submitted (Yes/ No)
i.	7.3 – 7.6 meter Uplink Antenna System (UPLINK PDA, Feed, LNA, BTR, ACU, and Dehydrator)		
ii.	2x20 KVA UPS including Battery Bank		

7. Certificate for Guarantee for following equipment from their respective OEMs:

S.No.	Name of equipment	Name of OEM	Guarantee certificate submitted (Yes/ No)
i.	7.3 – 7.6 meter Uplink Antenna System (UPLINK PDA, Feed, LNA, BTR, ACU, and Dehydrator)		
ii.	2x20 KVA UPS including Battery Bank		

8. Certificate for After sales service support for following equipment from their respective OEMs:

S.No.	Name of equipment	Name of OEM	After sales service support certificate submitted (Yes/ No)
i.	7.3 – 7.6 meter Uplink Antenna System (UPLINK PDA, Feed, LNA, BTR, ACU, and Dehydrator.)		
ii.	2x20 KVA UPS including Battery Bank		

9. Datasheet for the offered equipment as per offered BOM: [Yes/No]

   i. 7.3 – 7.6 meter Uplink Antenna System - UPLINK PDA, Feed, LNA, BTR, ACU, wave guide, low loss cable and Dehydrator
   ii. 2x20 KVA UPS including Battery Bank

Signature .....
Name & Designation of authorized signatory.....
Name of the Bidder .....
Stamp of the bidder