RTI REQUEST DETAILS (आरटीआई अनुरोध विवरण)

Registration Number (पंजीकरण संख्या) :	AAOIN/R/T/23/00356/5	**Date of Receipt (प्राप्ति की तारीख) :**	30/06/2023
Transferred From (से स्थानांतरित):	Airports Authority of India on 25/07/2023 With Reference Number : AAOIN/R/T/23/00356		
Remarks(टिप्पणी) :	**Pertains to AAI**		
Type of Receipt (रसीद का प्रकार) :	Electronically Transferred from Other Public Authority	**Language of Request (अनुरोध की भाषा) :**	English
Name (नाम) :		**Gender (लिंग) :**	Male
Address (पता) :			
State (राज्य) :	Uttar Pradesh	**Country (देश) :**	India
Phone Number (फोन नंबर) :		**Mobile Number (मोबाईल नंबर) :**	
Email-ID (ईमेल-आईडी) :			
Status (स्थिति)(Rural/Urban) :	Urban	**Education Status :**	Details not provided
Requester Letter Number(निवेदक पत्र संख्या) :	Details not provided	**Letter Date :**	Details not provided
Is Requester Below Poverty Line ? (क्या आवेदक गरीबी रेखा से नीचे का है?) :	No	**Citizenship Status (नागरिकता)**	Indian
Amount Paid (राशि का भुगतान) :	0 (Received by **Ministry of Civil Aviation**) (original recipient)	**Mode of Payment (भुगतान का प्रकार)**	Payment Gateway
Does it concern the life or Liberty of a Person? (क्या यह किसी व्यक्ति के जीवन अथवा स्वतंत्रता से संबंधित है?) :	No(Normal)	**Request Pertains to (अनुरोध निम्नलिखित संबंधित है) :**	M S Alawa
Information Sought (जानकारी मांगी):	The information sought does not pertain to Dte. of Operations. Hence, the RTI is being transferred to CPIO, CNS-P-I Dte. with a request to provide the information at Point No. 1 directly to the applicant.		
Original RTI Text (मूल आरटीआई पाठ):	1. Where are the locations in which Mobile or Portable ATC being used and what are its specifications. 2. Does Radio operated mobile airfield lighting system is being held in inventory and where is being utilized.		

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Print

Government of India
Airports Authority of India
R G BHawan, New Delhi

Dated: 01/08/2023

Registration Number : AAOIN/R/T/23/00356/5

Dear Sir/Madam

I am to refer to your Request for Information under RTI Act 2005, received vide letter dated 29/06/2023 and to say that *The information sought iro point no. 1 has already been replied by Shri R.K.Verma, CPIO, CNS-P2 Dte as the matter pertains to CNS-P2 dte. However, once again the copy of the same reply is attached herewith for information. Hence the request is disposed off..*

In case, you want to go for an appeal in connection with the information provided, you may appeal to the Appellate Authority indicated below within ***thirty days*** from the date of receipt of this letter.

S N Borkar
FAA & ED (CNS-P)-I
Address: R G Bhawan, New Delhi
Phone No.: 20818214

Yours faithfully

(M S Alawa)
CPIO & GM CNSP-I
Phone No.: 24616173
Email : msalawa@aai.aero

Status of 08 nos. of Mobile ATC Tower

S.No.	Mobile Tower-Stations	Date of Installation/SAT	Status
1.	Hollongi	29th Nov 2018	Commissioned on 28.07.2022
2.	Bilaspur	22nd Nov 2018	Commissioned on 07.11.2019
3.	Bokaro	15th Nov 2018	Commissioning in progress
4.	Jagdalpur	29th Nov 2018	Commissioned on 07.11.2019
5.	Jeypore	06th Dec 2018	Commissioned on 30.05.2022
6.	*Hirasar*	Not installed	
7.	Utkela	06th Dec 2018	Commissioned on 10.03.2022
8.	Vellore	13th Dec 2018	Commissioned on 30.07.2022

PART-C: QUALITATIVE REQUIREMENTS

Mobile ATC Tower

Section Number	Requirement Statements (s)	Compliance Status (C,P,N)	Document Reference	For P/N: Alternative or Explanation
1.0	**GENERAL**			
1.1	The Scope of work includes Supply, Installation, Testing and Commissioning of working trailer mobile ATC tower system that is complete in all respect and is fit for operational use. The System shall provide all the interfaces and meet the performance requirements within the full specifications.			
1.2	The specifications mentioned in this document specify the minimum performance requirements for Mobile ATC Tower to meet the requirements of CNS/ATM infrastructure at RCS airports in India, where the infrastructure for ATC Control Tower does not exist.			
1.3	Compliance with this technical specifications is recommended as a means of assuring that the equipment will satisfactorily perform its intended functions under all conditions normally encountered in Air Traffic Management operations.			
1.4	**Recommended Phrases**: (i) Shall - The use of the word 'Shall' indicates a mandated criterion; i.e. compliance with the particular procedure or specification is mandatory and no alternative may be applied. (ii) Should - The use of the word 'Should' indicates that though the procedure or criterion is regarded as the preferred option, alternative procedures, specifications or criteria may be applied, provided that the manufacturer, installer or tester can provide information or data to adequately support and justify the alternative.			
1.5	**Description of the System:** The Mobile ATC Tower system shall be used At Airports, identified under Regional Air Connectivity Scheme of Govt. of India and where infrastructure for ATC Control Tower does not exist.			

	At medium/low density airports for disaster /emergency response in case available ATC Tower infrastructure is rendered unusable due to flood, earthquake or unlawful activities etc. To meet special operational requirements such as VIP Movements at remote airstrips/airfields.			
2.0	**SYSTEM CONFIGURATION:**			
2.1	The Mobile ATC Tower shall be trailer mounted and consist of following main components; i) Trailer ii) Lifting Device iii) Mobile Tower Cabin			
2.2	CNS/ATM Systems include: i) Voice Communication System; ii) Digital Voice Recording System; iii) VHF Radios; iv) Uninterruptible Power Supply system; and v) GPS Clock System.			
2.3	Meteorological Sensors			
2.4	Electrical System			
2.5	Ancillary systems and tools			
3.0	**STANDARDS**			
3.1	The operation of the Mobile ATC Tower shall be in compliance with the guidelines mentioned in the following documents			
3.1.1	**ICAO**			
3.1.1.1	(a) ICAO Annex 3 – Meteorological Services; (b) ICAO Annex 5 – Units of Measurement; (c) ICAO Annex 10 – Aeronautical Telecommunication; (d) ICAO Annex 11- Air Traffic Services; (e) ICAO DOC 9837- Manual on Automatic Meteorological observing systems at aerodromes (f) IEC EN 62305- Protection against Lightning; (g) IEC -61643 – Low voltage Surge Protection Devices; (h) IEC EN 61000-4-2 (ESD); and			

	(i) ED 137 IP Based Radio interfaces (j) ISO Standard 9000-2005 Quality Management System - Compliance Systems shall be complaint to latest amendment to the applicable standard as on the date of tender submission			
4.0	**REQUIREMENTS AND TECHNICAL SPECIFICATIONS OF MOBILE ATC TOWER**			
4.1	**ATC Tower Trailer Requirements:** i. The number of axles, tyre configuration with spare stepney and type of axle selected should confirm to the Trailer registration requirement in India. If the tyre configuration is up-to six then one stepney will be supplied and if the tyre configuration is more than six then two stepnies will be supplied. The stepney must be secured in a place providing easy access and preventing the stepney from moving unless it is disconnected from its mounting. ii. Shall have towing mechanism suitable for attaching with Indian trucks/tractor. iii. Shall have air suspension on all the axles or leaf spring with shock absorbers on all the axles. iv. Trailer should confirm to the safety requirements for suspension, steering, brakes and electrical system. v. Shall have flat bed of dimensions specified above to take the load of ATC tower, accessories and other components. vi. Shall be fitted with hydraulically operated lift enabling the tower cabin to rise up to a height of not less than 08(Eight) meters from ground level to roof top of tower. vii. Shall be fitted with suitable stabilizers/ outriggers (hydraulic/ mechanical operated), to give suitable stability at the operational height under specified weather conditions. iii. Provision of suitably mounted DG set on the trailer with enclosure. ix. Provision to house suitable ladder in the trailer during transportation of trailer. x. Shall have emergency operation system for lowering the cabin and lifting of stabilizers during emergency.			

	xi. Shall have two control panel for lifting/ lowering of ATC tower ,one in the ATC cabin and another near the bed of the trailer. xii. Both the control panels shall be provided with emergency stop switch. iii. All the switches of the control panel shall have proper lighting system. iv. The AC supply wire from DG set to ATC cabin shall be properly laid and concealed in a safe and secure manner, conforming to safety norms. xv. The control panel shall have proper locking arrangement and weather shield for security and protection. vi. The switches of control panel shall be of Bureau of Indian Standards (BIS) or other equipment standard. vii. Material of flat bed, towing mechanism, axles and other part of the trailer shall be as per Indian Standard/or equivalent and shall meet the Indian regulatory requirement. iii. The distance between the front and rear axle and rear over hang from the center of rear axle are to be kept as per the Indian Standard. ix. Hydraulic high/low pressure hoses used for operation of scissor lift, stabilizer and boom shall be conforming to BIS or equivalent standards. xx. All the electrical cables and wires shall be BIS or equivalent standards. xi. Metallic pipe lines of hydraulic system shall be properly laid and secured in such a manner that they are free from shocks and vibrations. xii. Self- contained Hydraulic pump system of suitable capacity to be used for lifting/ lowering of ATC cabin/stabilizers. iii. The pump shall be able to run from 220-240 V,50Hz AC supply from Mains power supply source or from DG Set.			
4.2	**ATC Tower Cabin Requirements:** i. ATC Tower Cabin shall be mounted on a trailer vehicle with hydraulic lift system enabling to rise up to a height of not less than 08(Eight) Meters from ground level to roof top of tower. The cabin size shall be minimum of 150 sq. feet.			

	ii. The lifting mechanism shall be automatically operated through switch operation. However, there shall be provision for manual operation in case of exigency conditions. iii. When deployed, the lifted tower shall withstand wind speeds of up to 60 Kilometer per hour. iv. Operational personnel shall access the cabin once lifted via a foldable stair/ ladder. The ladder design shall be in accordance with the best commercial practices. v. The structure should be self-supporting of continuous sandwich elements made up of two facings with rigid foam core. vi. The cabin walls shall be constructed from sound proof material and weather proof. The Outer and inner facings should be made up of chromate aluminum sheets. vii. The Trailer shall have adequately strong suspension system to cushion CNS/ATM and other sensitive electronic equipment's during transportation. These shall also be required to be fixed inside the cabin for avoiding any kind of displacement during operation or transportation. viii. The cabin must be ergonomic for comfort of ATC officers and technical personnel. The flooring shall be of low electrostatic discharge, fire resistant and industrial carpet or matting. The vendor shall use environment friendly materials and products for flooring and furnishings with low pollutant emissions including composite wood products, adhesives, sealants, paints etc. The interior paint shall be of low volatile organic compound (VOC) product. Fire retardant material must be used to maximum extent possible. The vendors are encouraged to incorporate cost effective innovative strategies such as highly reflective roofs to minimize consumption of energy etc. ix. The windows shall consist of insulated type safety glass. They shall be mounted with an angle against the vertical axis to allow optimum visibility. Adequate arrangement should be in place to avoid			

	moisture accumulation on the glass sheets, externally and internally. x. In its operational state, the tower shall ensure a 360-degree circular view for the controllers who can perform all visual air traffic service and control functions. xi. The cabin shall be capable to accommodate two (02) controller working positions along with all supportive equipment and infrastructure. xii. The lighting inside the cabin should be appropriate for a glare free vision for the airfield. Also it must adequately provide lighting for approaching the equipment for preliminary fault finding/rectification. xiii. The cabin shall have redundant systems for environment control (cooling and heating). xiv. The external colour of the tower shall be standard aviation colour [box checks of white and orange]. The external paint shall be low volatile organic compound (VOC) product. xv. Obstruction light shall be mounted on the roof top of the cabin.			
4.3	**CNS/ATM SYSTEMS:** **VHF/AM Radio Transmitter and Radios** i. The mobile tower shall be capable of operating two frequencies. Each frequency shall have dedicated main and standby transmitter and receiver. ii. In addition to above in Para 4.3(i), there shall be provision of one VHF/AM Trans receiver. There shall be also provision for three VHF-FM Walkie Talkie sets with base station. iii. The vendor shall supply VHF/AM radio transmitters, receivers and trans receivers that complies with ICAO Annex 10 standards [Amendment applicable on the date of submission of tenders]. iv. The radio equipment shall be synthesized and multichannel operating in aviation band 118 – 136.975MHz.			

4.4	**VHF/AM Radio Transmitter and Radio:** **a) Transmitter Output** power: 50 W. **b) Modulation Types:** AM and D8PSK VHF **c) Modes:** AM Voice, VDL Mode 2 **d) Channel spacing:** 25 kHz and 8.33 kHz. **e) Interfaces**: Self-locking Lemo for microphone / headset; 4W E&M for voice and data; 3 individually addressable Ethernet ports for VoIP and RCMS; 2 N-Type coaxial antenna connectors **f) Input Power:** 230 V AC or 24 -30 V DC. **g) Preset Channel:** 10 **h) Inter modulation distortion (Modulation distortion)**: at 90% modulation <5%. **i) Audio distortion (Receive AF distortion)**: at 30 % amplitude distortion (1 KHz), shall be less than 5 %. **j) Audio input level shall be (AF input)** : + 6 to -15 dbm.			
4.5	**Antenna System:** **i. There shall be** two (2) VHF antennae (2 ports) with obstruction lights and lightning protection with three (3) coaxial cable lightning surge protection system. The Antenna shall be foldable. There shall be a minimum of eight feet of separation between the antennas in all directions. The mounts must include water tight penetrations for the antenna cables. **ii. Antenna input impedance** : 50 Ohms iii. **Antenna polarity**: Vertical polarization iv. **Horizontal field type**: All directional **v.** Antenna shall be able to operate in operating temperature range of –5 to + 60 Degree Centigrade and withstand wind speed up to 60 kilometer per hour.			
4.6	**Voice Communication System(VCCS):** i. The VCCS shall employ IP Based modular, client-server architecture, with open platform software and commercial-off-the-shelf hardware. ii. A single failure in VCCS shall not result in the loss of large system parts. The			

	server shall be fully redundant and in parallel processing mode. It shall consist of hot swappable interfaces. The system shall operate with decentralized call control. iii. The VCCS shall essentially consist of following; a. Radio communications or Ground - Air – Ground Communication (A/G) for voice communication between pilots and air traffic controllers. Segments: - b. Telephone communications or Ground- Ground Communications for voice communication between the controllers within the same unit or with other units. c. At the operator positions, both types of communications A/G and G/G shall be operated combined by means of split headset operation or independently. d. Monitoring, control and Technical supervision of system iv. The voice communication system shall be ED 137B complaint. v. VCCS shall be reliable and suited for communications with VHF radios in the Aeronautical Mobile Service band, accessibility to PSTN, PABXs, Mobile, and VoIP circuits for two operator positions.			
4.7	**VCCS System essential characteristics:** a. System shall have a PTT delay less than 20ms. b. The system shall grant a call set up time via direct access for less than 100ms c. The system shall grant a call setup time for any other outbound call less than 200ms. **d.** The system shall grant a main/standby radio transfer time less than 200ms e. The system shall be able to operate on 230 V AC and 24V/48V DC power supply. The power concept shall provide fully redundant power supply.			

	f. It shall be possible to select operating frequencies on the touch screen panels on the operator consoles. **g.** The system shall support both automatic and manual radio main/standby switching. **h.** The system shall indicate an error message at the operator position in case of radio outage. **i.** The system shall support simultaneous transmission on multiple frequencies. j. The VCCS shall include an Automatic fault detection and isolation provided by Built-In- diagnostic. **k.** The VCCS Central Equipment shall incorporate one (1) fully redundant central equipment, with redundant AC power supplies, Communication Processors modules, two (2) Digital Audio Processor modules with a capacity of eight (8) radio interfaces (MAIN/SBY), one channel bank telephone module (12FXS and 12FXO lines), one (1) distribution frame, cable kit for interconnections and an installation kit. **l.** The VCCS Operator Position shall consist of 1 touch screen 12" display, 1 position audio control module,1 loudspeaker, jack-boxes (operator and supervisor), 1 headset with PTT,1 handset with PTT .			
4.8	**Digital Voice Recorder(DVR) and replay system:** **i.** The mobile control tower shall be equipped with a 32-channel Digital Voice Recorder (DVR) and replay system to record and archive both telephone communications and radio communications. **ii.** The digital voice recorder shall support EUROCAE ED 137 B standards and suitable for recording both analogue and digital inputs. **iii.** The digital voice recorder shall save every single audio file in uncompressed WAV-format. **iv.** Every single audio WAV- file shall use uncompressed G.711 audio codec.			

	v.	Every single recording file shall have its own time stamp for clear identification.			
	vi.	The system shall be state of the art utilizing TCP/IP interface protocols and other modern industry standards.			
	vii.	The system shall be redundant and configured to operate in MAIN/HOT SBY mode for 99.999% availability purposes.			
	viii.	The system shall run on full redundant duplicated system including power supplies.			
	ix.	The digital voice recorder shall fulfill all relevant national and international legal requirements on voice and data recordings and related data recordings.			
	x.	Data shall be recorded and archived in internal storage disks of the system. The size of the disks shall be large enough (minimum 1TB) to archive data for a period of at least 90 days. The system storage occupation shall be visible in monitoring application.			
	xi.	The digital voice recorder shall include automatic or manual archiving of records to several storage solutions like DVD/External HDD/USB Flash drive etc. It shall be possible to take back up of the recorded data on a removable media device (DVD/External HDD/USB flash drive etc) for future investigation etc. without affecting the original recording. The digital recorder shall include manual exports. It should offer the possibility to export audio files in WAV, MP3 and Speex formats.			
	xii.	The DVR shall be capable of recording activity only when recording input is available.			
	xiii.	The digital voice recorder shall include live listening and radio and telephone channels. It shall be possible to listen/mute every single channels of the live listening application.			
	xiv.	The vendor shall supply a replay unit along with replay software for recorded voice.			
	xv.	The digital voice recorder shall include a configuration application. The configuration application shall include			

	feature to back up the current configuration. It shall be possible to trace every single change of the configuration log files.			
4.9	**General requirements of CNS/ATM Systems:** i. The vendor shall use available commercially of the self [COTS] hardware and software for the offered computer based CNS/ATM Systems. Details of vendor specific hardware and software, if any, shall be provided. ii. Vendor shall supply all the required licenses [Hardware/Software] for life time use of the system. iii. Vendor shall supply any special purpose test equipment's required for maintenance and operation of the offered systems. iv. Vendor shall provide details of general test equipment's required for maintenance and operation of offered systems. v. Lightning and Surge protection system shall be provided as per IEC 62305 standards for the mobile tower including the equipment and systems. vi. All the CNS/ATM systems shall operate on 230V (+/- 10 %), 50 HZ (+/-2HZ) single phase UPS output supply. The systems shall also be capable to operate on 24-30V DC backup power supply. vii. Wherever time stamping is required, Systems shall be synchronized with Tower GPS clock system. iii. **Earthling system**: - The Tower cabin shall be provided with 04 no's 4" thick 6 feet long Earthing Rods with 20m 50 sq.mm insulated Cu wire attached to earth the Mobile Tower structure at four corners. ix. Vendor shall provide minimum tools to install/dismantle/configure/position/repair facilities / accessories of Control Cabin. x. Outdoor modules of CNS/ATM and other equipment's such as Radio Antennas, GPS Receivers and Meteorological sensors shall be suitably mounted and shall be easily dismantled or folded for transport from one location to other. xi. All the batteries used will be Sealed Maintenance Free type (SMF type).			

	xii. CNS/ATM and other equipment's shall be mounted in standard COTS 19" Rack/Cabinets. iii. CNS/ATM equipment's shall withstand an operational temperature between -5 to +45 Degree Centigrade and operational humidity of 93% at +40 Degree centigrade.			
4.10	**Digital GPS clock System:** The tower cabin shall be provided with GPS clock system. This shall be used to synchronize other operational systems in the tower cabin and indicate time to the air traffic control officers and generally consist of the following components:			
4.11	**Un Interruptible Power Supply(UPS):** **i.** All the CNS/ATM equipment and other sensitive electronic equipment are installed in the tower shall be provided with online UPS power backup. The UPS shall work on 230V, 50 HZ, Single phase power supply. **ii.** The UPS capacity shall be 10 KVA with back up time of 01 Hour. **iii.** The UPS shall be rack mounted, modular type. **iv.** UPS shall be a single module of on-line technology that meets the stated performance requirements. The UPS system control shall provide connection control circuits, disconnection control circuits, system instrumentation, system status indicators, system alarms and system diagnostic. **v.** Input power to UPS will be AC power supplied either from the commercial electric supply or from a standby engine Generator power supply mounted (Standby power supply). **vi.** The UPS system shall have built-in protection against under voltage, over current, and over voltage, including lightning surges introduced on the primary AC source and voltage and current surges on the output caused by load transfer. **vii.** UPS output voltage tolerance shall be ±1% of the rated output voltage and frequency tolerance shall be ±0.1% of the rated frequency. The harmonic component tolerance shall not exceed 3%.			

	viii. Important UPS Parameters like Power supply voltage, frequency and other parameters like load on UPS, battery status etc shall be automatically monitored by the inbuilt circuitry of UPS and be recorded with the help of diagnostic tools/displays provided with the UPS.			
4.12	**Meteorological equipment / system [Automatic Weather Observation System(AWOS)]:** Vendor shall supply a fully configurable Airport Automated Weather Observing System (AWOS) that collects, processes and visually displays meteorological data to Air Traffic Controllers. All the meteorological sensors shall be suitably mounted AWOS shall be compliant with relevant WMO/ICAO standards. **Meteorological Data Sensors:** **i. Wind Sensor(One)** **Wind Direction Sensor shall have the following minimum specifications:** **a.** Range: 0- 360degrees **b.** Accuracy: ±3 degrees **c.** Minimum threshold: <0.4m/s **ii. Wind speed sensor with following minimum specifications;** **a)** Range: 0.4 to 75m/s **b)** Accuracy: ±0.17m/s **c)** Minimum threshold: <0.5m/s **iii. Temperature and Humidity probe (One):-** **It shall have the following minimum specifications;** **a)** Temperature range: -80 to +60 degrees Celsius **b)** Humidity range: 0 to 100% **c)** Accuracy: ±1%RH **iv. Barometric Pressure Sensor shall have the following minimum specifications;** **a)** Numbers of sensors: at least 2 **b)** Range: 500 to 1100hPA **c)** Resolution: Class A: 0.01hPA **d)** Accuracy: Class A±0.01hPA over full temperature range **v. Present Weather Sensor:-** a) Present weather sensor shall be capable of measuring accurate traceable measurement of			

	prevailing visibility precipitation type, its intensity & accumulation. b) The system shall have the capability to detect different types of precipitation viz. rain, freezing rain, drizzle, freezing drizzle, mixed rain/snow, ice-pellets, fog, mist, haze(smoke, sand) or clear. c) System should be capable of generating report as per the requirement of WMO/ICAO. vi. **Meteorological data display**: - The display shall be designed for viewing real-time wind, pressure, and temperature weather information in accordance with ICAO standards and recommendations.			
4.13	**Electrical System:** a) Means of plugging in Commercial Mains power supply (440 Vac/50Hz, 3-Φ and also 230Vac/50Hz 1Φ nominal) to the control tower shall be provided. A battery based UPS and Diesel Generator shall provide electric power where/when mains power is not available. b) Power supply distribution board shall be provided with lightening and surge protection system, protective MCBs, switches, MAINS/SBY generator selector switch, lift up/down switch etc. c) The Electrical installation shall include wiring, grounding, fuse box, internal lighting and obstacle lights. Entire lighting shall be low –watt LED lights. d) Electrical cabling shall be hidden in cable tray or similar device behind the consoles or desks. e) Cable outlets must be shielded against environmental hazards like dust, snow and water.			
4.14	**Standby Diesel Generator:** The vendor shall provide a diesel generator, mounted on the tower cabin trailer and wired completely as alternative source of electrical power. Following are essential features of diesel generator:- a) The diesel generator shall also provide automatic take over in case of mains power supply failure within less than 10			

	seconds. During this time period the tower is fed power from its built in back up system thus providing for uninterrupted operation. b) The generator shall be able to supply for full capacity tower load adequately and withstand long non-stop operating hours c) Other important technical data of DG set: I. Power rating: 20 KVA minimum II. Rated voltage 3 phase: 440V III. 50 HZ speed : 1500 rpm IV. Fuel Capacity at Full load: 09 Hrs. V. Degree of Protection: IP54			
4.15	**Air Conditioning Unit:** a. Redundant Air Conditioning Unit shall be integrated in the tower cabin. The vendor shall calculate and recommend correct capacity. b. Air conditioning system shall be capable to run on 24/7 basis to maintain 24 Degree cabin temperature at 30% RH.			
4.16	**Crash alarm system:** a. The tower cabin shall have a standard crash alarm system and appropriate means of actuating it locally and remotely. b. The crash alarm local switch shall be mounted in the console and a siren (loudspeaker) mounted on the roof of the cabin. **c.** The Vendor shall provide remote controlled sirens positioned in nearby fire Stations including associated remote controller.			
4.17	**Ancillary equipment /Systems/facilities:** **a.** A pair of night vision Binoculars **b.** Operations Chairs and other suitable furniture **c.** Fire extinguisher (appropriate) **d.** First aid kit **e.** Signal light gun			
4.18	**Continuity:**			

	The system shall perform its required function with no unscheduled interruption.			
4.19	**Reliability:** The Reliability figure for the Mobile ATC Tower System shall be **99.996%.**			
4.20	**Integrity:** The integrity of the Mobile ATC Tower System shall be 10^{-6} or better on a per report basis			
4.21	The availability is considered to be a part of reliability, and is defined as the probability that a system will perform its required function at the initiation of the intended operation. Availability is quantified as the ratio of the time the system is actually available to the time the system is planned to be available: Availability = MTBF/(MTBF+ MTTR) MTBF: Mean Time Between Failure MTTR: Mean Time To Repair The Mobile ATC Tower System shall achieve an Availability of **99.996%.**			
4.22	**QUALITY ASSURANCE STANDARDS:** Mobile ATC Tower System supplier shall use Quality Assurance procedures complaint with : **a.** Quality assurance in system design, development, manufacturing, installation and servicing – ISO 9001 **b.** Quality Management & Assurance Standards Part-3 – ISO 9001 Application and Development, Supply and Maintenance of software.			
4.23	**Factory Acceptance Test(FAT):** The contractor shall develop test procedures for approval of AAI and conduct FAT. The test procedures shall include all the critical and major tender requirements and shall clearly indicate the traceability matrix with reference to each specification.			
4.24	**Site Acceptance Test (SAT):** The contractor shall develop test procedures for approval of AAI and conduct SAT. The test procedures shall clearly indicate the traceability matrix with reference to each specification defined in the tender. SAT procedures shall			

	include all technical & operational requirements that can be tested in live environment.			
4.25	**DOCUMENTATION:** The Vendor shall provide two copies of system, manual and installation drawings. The installation drawing shall include drawings for equipment, power layout, RF and Audio layout.			
4.26	**TRAINING :** a) The Vendor shall provide Maintenance training to Ten officials of AAI at OEM site for 10 working days b) The Vendor shall provide operation training to Ten ATM officials of AAI at 1st or 2nd site in India for 03 working days. c) The Vendor shall provide operation /general maintenance training to Ten EQPT/TECH officials of AAI at 1st or 2nd site in India for 03 working days. d) Training of AAI technical staff shall cover theoretical and practical part e) Syllabus of training program shall be submitted to AAI prior to training. AAI has the right to request modification of such program. f) Such modifications shall be respected by the Contractor without any additional payment. AAI shall confirm submitted program in writing.			