

COMMUNICATION, NAVIGATION AND SURVEILLANCE MANUAL

VOLUME - I

Maintenance of CNS Facilities



**DEPARTMENT OF CIVIL AVIATION
MYANMAR**

1st Edition, 2009

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FOREWORD

Department of Civil Aviation, Myanmar provides Aeronautical Telecommunication services in accordance with Annex 10 to the Chicago Convention. These services are Aeronautical fixed service, Aeronautical Mobile Service, Aeronautical Radio Navigation service and Aeronautical broadcasting service. In order to achieve the objective of Aeronautical Telecommunication service there is a need to specify procedures necessary for the safety of air navigation for the uniform application throughout Myanmar.

Maintaining the acceptable levels of safety requires standardization and quality assurance in every sub system of Aeronautical Telecommunication System at one end and maintaining harmony with the ICAO standards and recommended practices at the other.

This manual of Communication, Navigation and Surveillance Services Volume I to VII has been developed by CNS Division of DCA, Myanmar as a part of comprehensive documentation to achieve this objective.

The Purpose of this document is to establish procedures, provide information and guidelines which are essential for the provision of safe and efficient Aeronautical Telecommunication services in the Myanmar FIR where such services are provided by DCA, Myanmar. It is published for use and guidance of its CNS personnel.

The CNS in-charge of an Aeronautical Communication Station will ensure that the provision of Aeronautical Telecommunication services under his jurisdiction comply with the processes, procedures and guidelines contained in this manual.

I am sure that this manual will fulfill the need for best practices in provision of Aeronautical Telecommunication Services according to international and national standards and recommended practices in meeting the requirement of ICAO Universal Safety Audit Oversight Programme, which aims at documenting what we do, doing what we have documented and finally demonstrating that we are doing so.

I, Therefore, call upon all the personnel engaged in the Operation and Maintenance of Aeronautical Telecommunication Services to comply with the standards and procedures given in this manual for enhancing safety in the airspace under their jurisdiction.

(Tin Naing Tun)
Director General
Department of Civil Aviation

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PREFACE

This Manual on Communication, Navigation and Surveillance Services Volume I to VII is prepared and maintained by the Directorate of CNS, CHQ, on behalf of the Department of Civil Aviation, Myanmar for the use and guidance of executives and staff of DCA. The Manual provides processes, procedures and instructions that are essential for the provision of safe and efficient air services within the airspace under the jurisdiction of DCA and at stations where Aeronautical Telecommunication services are provided by DCA including coordination with neighboring / adjacent FIR.

This Manual has been developed as a part of comprehensive documentation of the Aeronautical Telecommunication procedures, processes and facilities supporting conformance to organizational requirements and compliance with National Regulations and Standards & Recommended Practices of ICAO Annex 10, DOC 8071 and other ICAO documents relevant to the provision of Aeronautical Telecommunication Services that are uniformly applicable to all the CNS stations. The topics covered under the seven volumes of CNS Manual are:

- Volume I – Maintenance of CNS facilities;
- Volume II – Communication Systems and Procedures;
- Volume III – Siting Criteria of CNS facilities;
- Volume IV – Flight Inspection of CNS Facilities;
- Volume V – Lightning, Surge protection and Earthing system of CNS equipment;
- Volume VI – Technical specifications and
- Volume VII – Maintenance Schedules of CNS Facilities.

This Manual should be read in conjunction with the following:

- a) ICAO Annex 10 (Volume I to V)-Aeronautical Telecommunication Services.
- b) Doc. 8071 Vol. I Flight Inspection Procedures for Navigation Aids.
- c) Doc 8071 Vol. III Flight Inspection Procedures for Surveillance system
- d) ICAO Annex 15 – Aeronautical Information Services.
- e) Doc 8126 Aeronautical Information Services Manual
- f) Doc 9683-Human Factor Training Manual.
- g) Doc 9734-Safety Oversight Manual
- h) Myanmar Civil Aviation Requirements (MCARs)

It is to be recognized that in the changing aviation safety environment, the need to amend the Manual may be necessitated due to number of causes, such as:

- a) Changes/ amendments to ICAO Annexes/ Documents.
- b) Changes/ introduction of Myanmar Civil Aviation Requirements (CARS)
- c) Introduction of CNS facilities based on new technology.
- d) Requirements from ATS, Airlines or any other concerned agency.

It is intended to keep this Manual up to date. Future editions of the Manual will most likely be improved on the basis of experience gained and of comments and suggestions received from the users of this Manual. Views, comments and suggestions for improvement of this edition, may be sent to the Deputy Director (CNS), Department of Civil Aviation Headquarter, Yangon, Myanmar.

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Record of Amendments

No.	Amendment Date	Incorporated on	Incorporated by

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Chapter - 1

Document Identification and Control

1. Title:

- 1.1 This document is identified as Manual of Aeronautical Telecommunication, Radio Navigational and Surveillance Service (CNS Services) abbreviated hereafter as CNS-Manual.

2. Purpose:

- 2.1 Purpose of this document is to establish CNS procedures and to provide information and instructions pertaining to CNS facilities, which are essential for the provision of safe and efficient air traffic services by Department of Civil Aviation, Myanmar. It is published for use and guidance of its CNS Maintenance personnel.
- 2.2 The CNS in-charge of the station will ensure that the processes, procedures and instructions contained in this manual for the provision of CNS facilities are strictly complied with by all concerned.

3. Responsibility for documentation, review, amendments and publication:

- 3.1 The Deputy Director (CNS) is responsible for development, review and amendments of CNS Manuals. He will ensure that the provision of CNS facilities as detailed in this manual are in conformity with Standards and Recommended Practices (SARPs) given in the Annexes to Convention on International Civil Aviation and National regulations.
- 3.2 The Director (CNS) is responsible for the approval of documentation & amendments and publication of CNS-Manual.

4. Interpretation of Words:

- 4.1.1 To avoid any misunderstanding within CNS, certain words are to be interpreted as having following specific meanings when they are the operative words in an instruction.

Works	Meanings
'shall', 'must' 'is/are to'	The instruction is mandatory.
'will'	It is only used for informative or descriptive writing
'may'	It means that the instruction is permissive, optional or alternative, e.g. 'a maintenance personnel may seek assistance.....' but would not, if he did not need it.
'should'	It means that it is strongly advisable that an instruction is carried out; it is recommended or discretionary. It is applied where the more Positive 'shall' is unreasonable but nevertheless a maintenance personnel would have to have a good reason for not doing so.

- 4.2 In the interest of simplicity, any reference to the masculine gender be taken to mean either male or female.

5. Effective Date:

- 5.1 Effective date of an instruction is indicated at the end of this chapter.
- 5.2 New edition will be indicated by the same date at the end of this chapter.

6. Change History:

- 6.1 This is 1st Edition of CNS Manual. Changes are indicated on 'Record of Amendments page'.
- 6.2 Amendments – documentation being inserted in the manual must contain headers and footers that are consistent with those given in this document.

7. Control of the manual:

- 7.1 **Directorate of CNS** will control this Manual electronically through DCA web site.

8. Distribution of the Manual:

- 8.1 Directorate of CNS may produce hard copies and control the distribution of these Copies, as deemed appropriate.

9. Master Copy:

- 9.1 An electronic and a hard master copy of each chapter contained in the Manual will be held and maintained by the CNS Directorate.

10. Checking Currency of Manual:

- 10.1 A current copy of the Manual will be published on Department of Civil Aviation web site.

11. Enquiries

- 11.1 Enquiries/Clarifications should be addressed to:

**Director (CNS)
Department of Civil Aviation, Myanmar,
HQ Building, Yangon International Airport
Mingaladon, Yangon - 11021
Telephone: 095- 01- 533020
FAX: 095- 01- 533016**

- 12. **Effective Date: 23rd Nov 2009.**

Chapter - 2

Maintenance System of CNS Facilities

1. Scope

This chapter describes the requirements and methods to be applied to the management and operation of CNS facilities to assure integrity and safe provision of service.

The Director (CNS) is responsible to the Member (Operations), DCA for ensuring that Aeronautical Telecommunications, Radio Navigation and Surveillance (CNS) Services provided by DCA satisfy regulatory, contractual and ICAO obligations. The kind of CNS services provided by DCA are enumerated in Para 2 below.

The DCA CNS Manual is a controlled document that encompasses all documents referenced within the manual. Referenced documents, therefore, are in effect part of this manual.

2. Classification of Facilities

2.1 Communication Facilities

- (a) HF Air/Ground voice communication facilities;
- (b) VHF Air/Ground voice communication facilities;
- (c) Voice switching and control facilities;
- (d) ATS point to point communication facilities;
- (e) Voice and Data Recording facilities;
- (f) Controller Pilot Data Link Communication (CPDLC);
- (g) Aeronautical Fixed Telecommunication Network -Automatic Message Switching System (AMSS)
- (h) Dedicated Satellite Communication Network (DSCN).

2.2 Radio Navigation Facilities:

- (a) Instrument Landing System (ILS);
- (b) Distance Measuring Equipment (DME);
- (c) VHF Omni-range (VOR);
- (d) Non-directional beacons (NDB) / Locators;
- (e) VHF Markers.

2.3 Surveillance Facilities:

- (a) Primary surveillance radar (PSR);
- (b) Secondary surveillance radar (SSR);
- (c) Automatic dependent surveillance (ADS);
- (d) Human Machine Interface systems, including Tower Consoles, ATS;

2.4 Other CNS Facilities:

- (a) ATC Automation system consisting of
 - (i) Flight Data Processing system
 - (ii) Radar Data Processing system
 - (iii) Repetitive Flight Plan (RPL) System

- (b) Airport Terminal Information Service (ATIS);
- (c) Master / Slave clock system;
- (d) Uninterruptible and emergency power supplies;
- (e) Meteorological Display Systems used for ATS.

3. Meeting of Standards

3.1 (a) As a signatory to the Chicago Convention, DCA subscribes to the relevant ICAO definitions and standards unless differences have been published in AIP. As a necessary supplement to ICAO standards and as a mature provider of telecommunication, radio navigation and surveillance services, DCA has implemented a range of services mentioned in Para 2, consistent with ICAO requirements.

(b) Conformance with these standards is achieved through the DCA implementation of the relevant Technical Standards and Practices (TSPs), Maintenance Schedules, CNS Circulars and periodic flight inspections of facilities.

3.2 For the above clause “Standards” mean any of the following standards that apply to a service or facility:

- (a) An ICAO standard;
- (b) Myanmar Civil Aviation Requirement (MCAR) promulgated by DCA, Myanmar;
- (c) Any other standard included in this CNS Manual.

4. Provision and Maintenance of CNS facilities

4.1 General Design Considerations

It is required to maintain the CNS facilities to ensure high degree of availability, reliability and integrity in providing Aeronautical Telecommunication, Radio Navigation and Surveillance Services as per the requirements of ICAO.

To ensure continuity in service and to reduce equipment failures due to support services, the provision of the following facilities have been made at the stations.

4.1.1 Protected Power Supply system

4.1.1.1 Dedicated electrical power supply is provided to DCA substation by the local power supply distribution authority. Standby generators are also located at the substation. In the event of failure of electric power supply, the changeover to DG set supply is done automatically. From this substation Power supply distribution to all units and CNS facilities at the airport.

4.1.1.2 The Engineering (Electrical) AEMSD, DCA is responsible for the maintenance of the power supply system and for providing power supply to different units within the airport.

4.1.1.3 UPS systems of required capacities have been provided in all the essential units to ensure continuous operation of communication facilities. In-charge CNS is responsible for maintenance of the UPS.

4.1.2 Air conditioning

4.1.2.1 To reduce failures of equipment due high temperature and humidity, central air conditioning is provided to all the CNS units established in the main terminal building. The remote sites are provided with separate air conditioning units according to requirements.

4.1.2.2 The Engineering (Electrical) AEMSD, DCA is responsible for the maintenance of all the air conditioning plants.

4.1.3 Battery Back-up

4.1.3.1 Provision for the battery back-up is made at the airports for all essential CNS facilities according to the requirements of each airport. The battery back-up system is located centrally at a suitable location in the equipment room and extended to required communication channels and master slave clock system. Suitable battery back up is provided at each navigational site. In charge CNS is responsible for maintenance of the battery back up system.

4.1.3.2 The station in-charge of aeronautical communication station is responsible for the maintenance of battery back-up system. The maintenance is required to be carried out as per the maintenance schedule available at the station. CNS Circular nos. 6&7 of 2003 in this regard also refers.

4.1.4 Non exchange lines

4.1.4.1 Multi-pair non-exchange lines are laid between different units for control, display of status, inter unit-communication, drop circuits, recording of voice and data monitoring of channels and dedicated speech circuits.

4.1.4.2 Lines from EPABX are provided to operational units and positions for providing telephones.

4.1.4.3 CNS personnel are responsible for provision and maintenance of such non exchange lines.

4.1.5 Direct Speech Circuits (DSC) and DIRECT STD/NON STD telephones

4.1.5.1 The DSC and telephones are provided by out side agencies and maintained by them on rental basis.

4.1.5.2 The DSC lines are extended to concerned ATC operating positions.

4.1.5.3 Important inter-communication telephones and DSC are provided through Speech Switching System (SSS) for immediate communications.

4.1.6 EPABX System.

4.1.6.1 Department of Civil Aviation has provided EPABX system of required capacity at Yangon and Mandalay International airports for communication and coordination among different units and operating positions.

4.1.6.2 The telephone exchange, lines and connected telephones are maintained by CNS personnel.

4.1.7 Synchronized Time System:

Time system synchronized with UTC is provided in operational units. Technical Standards and Practices (TSP) on time synchronization have been described in CNS Manual Vol. VI Chapter 2.10.

4.2 Provision of CNS Facility

For provision of CNS facilities in accordance with standards the following procedures are adopted:-

4.2.1 Procurement of Equipment:

4.2.1.1 The equipment required for providing communication facilities is procured by CNS Directorate under the control of Director General, DCA. While procuring the Equipment the concept of 'redundancy' (main & standby) with automatic change over from main to stand-by equipment is followed.

4.2.1.2 The equipment procured meets all the technical requirements and Specifications. Equipment with high degree of reliability and ease of Maintenance is purchased.

4.2.1.3 Multiple copies technical manuals for the equipment are also procured along with the equipment. The manuals incorporate Technical specifications, data on accuracy, reliability and integrity, installation, maintenance and operation procedures.

4.2.1.4 The test equipments required for maintenance are normally procured along with the equipments.

4.2.1.5 The selected spare modules and components are procured with the equipment to ease the maintenance.

4.2.2 Installation and commissioning of equipment

4.2.2.1 The equipment at the required location is installed, site tested and commissioned by technical experts of related CNS division as per the instructions contained the technical manual of the equipment. CNS equipment procured under turn key project are installed and commissioned by the original equipment manufacturer (OEM) or its authorized representative.

4.2.2.2 The testing is carried out to check the functioning of the equipment as per Parameters specified in the technical manuals.

4.2.2.3 The facility is handed over to concerned ACS and after commissioning, for operation and maintenance.

5. Functional Specifications and Performance Values of Services

Unless differences from the applicable ICAO standards, recommended practices and procedures have been published, DCA subscribes to the relevant ICAO standards and CAR for performance values of service.

5.1 Functional Specifications

5.1.1 Functional Specification of CNS Equipment

The functional specifications for each facility may be accessed through Manufacturer's Documentation held at the station. Alternatively, such information may be obtained from TSPs for facilities described in CNS Manual Vol. VI Chapter 2.2 to 2.8.

5.1.2 Availability and Reliability of CNS Facilities

Availability and reliability values are described in Performance Targets for CNS facilities CNS Manual Vol. VI Chapter– 1.

5.2 Derivation of Performance standards

The performance values for availability and reliability are derived from the applicable standards, manufacturers' specification, site specific parameters, and related operational requirements and compared to their respective measured values. Corrective action is to be taken if differences are found.

5.3 Analysis of Availability and Reliability

Availability and reliability analysis are the accepted industry methods used to calculate performance values of services provided. Availability is analyzed on monthly basis. Reliability analysis is progressively being developed. Data is available from fault reports delivered from stations to headquarter. These activities are underpinned by the conduct of System Performance Reviews at CNS headquarter.

5.4 Integrity values of CNS Equipment

Integrity values for each kind of navigation aid facility are defined in Performance Targets for CNS facilities in CNS Manual Vol. VI Chapter – 1.

6. Technical Descriptions

6.1 Station CNS Manual of each ACS shall describe the following items:

- (a) The type and location of each facility;
- (b) The Technical specification of each kind of facility;
- (c) How each facility inter-connects with other facility or service;
- (d) The way in which each station monitors each facility to ensure that it is operating in accordance with its technical specification.

7. Safe Operation

7.1 The Safe Operation of the facilities is achieved by the following:

- a. Normally no revision of design in facility is undertaken as state-of-the art equipment is procured and installed at the stations. The changes, if any, required in the design of service/facility are carried out by qualified and competent persons after issuance of approval thereof by CNS Directorate.
- b. The changes to a service or facility are directed by HQ after examining the need for the same at various levels of management. The change in service or facility is designed, tested and implemented following the standard practices.

- c. The procedure for commissioning a new service or facility is described in chapter 5 of this manual.
- d. The operational performance of services/facilities is actively monitored and historical records of faults and failures are maintained by CNS Directorate. Current performance and trend data is also available in the Directorate in electronic form.

7.2 The Station CNS Manual of each ACS shall describe the following:

- a. The procedure that records the way in which each CNS service and each related facility is configured at any time
- b. The procedure to be used to monitor the performance of each service and facility, and to compare the results with the appropriate technical specification.
- c. The procedure to be used if a service fails or a facility fault occurs, including the way in which the failure or fault is to be reported and rectified.
- d. The procedure to be used to:
 - (i) detect and correct any latent defects in equipment.
 - (ii) change soft-ware to adopt to any changes to the configuration of hardware.
 - (iii) change the design of equipment or facility to adapt to any change to the functional or technical specification.

For sub-Para d(ii) soft-ware includes any form of data or instructions for electronic device.

8. Facility Operation and Maintenance Plan

8.1 Flight Inspection

Flight inspection means verification of standards of signal in space of Navigational and Surveillance facility. It is carried out by DCA using its own appropriately equipped aircrafts.

8.2 Operation and maintenance plan for each type of facility is described in each Station's CNS Manual.

8.3 Maintenance Personnel

8.3.1 Trained and skilled personnel

8.3.1.1 DCA has provided proficient and trained personnel at each ACS for the maintenance of CNS facilities.

8.3.1.2 Quality maintenance is carried out by proficient and skilled technical Personnel as described below:-

- (a) DCA ensures that each maintenance personnel is competent and holds the qualifications consistent with those specified by DCA Headquarters.
- (b) In particular, DCA will ensure that each technical personnel has been Appropriately trained; and Assessed as proficient, through a proficiency examination, to maintain a particular model of CNS System.

(Details of the proficiency scheme are given in CNS Manual Vol. VI Chapter 2.11 and 2.12)

- (c) DCA maintains certification record at DCA headquarter for each qualified technical personnel that includes:
- The name of the technical personnel; and
 - Describes the kinds of facility or facilities for which the technical personnel is authorized to perform those functions; and
 - States the period during which the certificate is effective.

8.4 Technical Maintenance Infrastructure

8.4.1 CNS Workshop

Every CNS station under the control of DCA has a workshop for repairing the faulty modules. The workshop is equipped with test benches, DC Power supplies and Test Equipments. Component level of minor system or defect of minor nature is repaired in the workshop.

9. Safety Management System

DCA has prepared Safety Management Manual. The manual provides the details of DCA Safety Management System (SMS) requirements under each of the safety objectives. These requirements ensure that DCA, Myanmar meets its regulatory obligations, that it meets its “due diligence” requirements in relation to the safety management of the services and regulatory authority which it provides.

Elements of the safety management system include:

Safety achievement

- . Safety culture
- . Design
- . Safety responsibilities
- . Competency.
- . Change management
- . Operational risk assessment
- . Abnormal operations
- . Documentation
- . Interfaces
- . Management of the SMS

Safety assurance

- . Safety performance
- . Safety incidents and concerns
- . Safety surveillance

Safety promotion

- . Safety communication, consultation and reporting

All personnel display attitudes and behaviors which reflect the primacy of safety in DCA operations, each person has a duty to identify and report factors or events which may impact safety of operations.

10. Agreements

Where DCA uses services provided by external agencies in support of CNS service, formal agreements are established in consultation with Legal Department of DCA to formalize responsibilities of the parties and the required performance standards.

11. Post-accident Performance Inspection

11.1 In the event of an accident/incident, following action shall be taken:

(a) The CNS facilities likely to be involved in accident /incident will be held secured till its inspection is completed. Para 11.1.1 may be seen below.

(b) Multi channel tapes will be sealed. In case of DVTR the DAT will be taken out from the recording system and sealed.

(c) Recording of Voice / Surveillance Data on multi channel Voice / Data recorders of ATC automation system, if applicable, shall be sealed.

(d) Duty officer logbook, maintenance records, maintenance schedules and fault log books shall be sealed.

The sealed records should be kept secured till suitable instructions are received. Further details may be seen at CNS Manual Vol. VI Chapter 2.15.

11.1.1 After an aviation accident or incident occurs and before any action is taken that could change the facility's performance, a special performance inspection shall be performed as soon as practicable:

The inspection shall be:

(a) Conducted by experts duly authorized by DCA in accordance with equipment maintenance schedules & instructions given by the DCA;

(b) The inspection shall be witnessed by suitably rated CNS maintenance personnel.

11.1.2 A Report of the performance inspection shall be supplied to the DGCA.

11.1.3 Where the performance inspection shows that the facility contributes to a hazard, it shall not be used until it is operating within its technical specification and confirmed by flight check unit.

11.1.4 The TSP on Post Accident investigation may be seen in CNS Manual Vol. VI Chapter 2.8.

12. Test Equipment

Preventive and routine maintenance is carried out by using Built in Test equipment of the facility and other test equipments procured for the maintenance of CNS equipment.

12.1.1 The following instructions and standards are required to be followed by the stations for the control, calibration and maintenance of test equipment:

- ◇ Calibrated test equipment is used in maintenance of a service or facility.
- ◇ Calibration is carried out at prescribed intervals for each type of test equipment and the measurement standards should be better than the accuracy standards prescribed by the manufacturers.

Records of the calibration of each item of test equipment should be retained at station level.

- ◇ Each item of test equipment should carry a visual identification of its calibration status, the date that the equipment was last calibrated, and the prescribed calibration periodicity.
- ◇ The calibration of test equipment is highly specialized function and should be undertaken by specialized agencies that are certified as meeting the general requirements for the competence of testing and calibration laboratories of national level.

13. Interruption to Service

13.1 Each station's CNS manual shall describe the procedure to be used in the event of interruption to service in the following manner:-

- a. The procedure to be used if Aeronautical Communication or Radio Navigation or Surveillance service is interrupted.
- b. Specify an acceptable recovery time for each service.
- c. The procedure to be used if the acceptable recovery time of a service is exceeded.

14. Document Control

This information is provided in Chapter 7 of this manual.

15. Security Program

Within Myanmar, Aeronautical Telecommunication, Radio Navigation and Surveillance facilities are owned and / operated by DCA, and as such are subject to the Security Program requirements of the DCA.

Each site where services are situated is subject to a specific periodic inspection of physical security measures by the Station – in - Charge.

16. Change to Procedures

This information is provided in Chapter 8 of this manual.

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Chapter - 3

Organizational Structure & Functions

1. General

1.1 Organization, Structure & Functions

1.1.1 Department of Civil Aviation, Myanmar

The Department of Civil Aviation is headed by the Director General (DG) and is a subordinate organization under the Ministry of Transport (MOT), the Government of the Union of Myanmar.

The Department of Civil Aviation (DCA) is one of the 10 departments and 2 institutes under the Ministry of Transport established by Executive Section of the Republic of the Union of Myanmar Constitution of 2008. The DG is empowered by the Myanmar Aircraft Act 1934 and Myanmar Aircraft Rules 1937 generally for regulating Civil Aviation Activities in Myanmar. The DG, being the head of the DCA, is authorized by the President and Minister of Transport for the purpose. The DG may further delegate the powers vested in him to other DCA officers to fulfill the obligations for effective safety oversight.

***Details of organization structure of DCA are provided at DCA Myanmar Exposition 2009.

1.1.2 Postal Address

Department of Civil Aviation, Yangon International Airport, Mingaladon 11021, Yangon, Myanmar.

2. Functions and responsibilities of DCA

Various functions and responsibilities of DCA, Myanmar are listed in Chapter 2.6 of the DCA Myanmar Exposition 2009. Further detail of roles, responsibilities and accountabilities of key Director (CNS) are provided in the Chapter -10 to this manual.

2.1 Provision of Maintenance of CNS Facilities:

2.1.1 Provision of maintenance of CNS facilities is one of the essential functions of DCA, while procurement of CNS equipments is carried out under the direction and control of Director (CNS).

***CNS Organization Structure is shown in Attachment of this Volume.

2.1.2 For the Operation and Maintenance of CNS facilities at each airport and enroute stations, an Aeronautical Communication Station (ACS) is established which is headed by an Officer-in-Charge, ACS whose level (Rank) depends upon the size and capacity of each ACS. The Officer-in-Charge, ACS reports to the Director (CNS).

2.1.4 The functions of Air Traffic Management service is carried out by ATM Directorate of DCA.

3. Functions of Directorate of CNS

3.1 Hardware/software maintenance at system/module & component level of :

- CNS facilities
- Automated Air traffic Control System
- Security Systems
- Passenger Facilitation like PA system, Flight Information Display System (FIDS), CCTV, etc.

3.2 Regular Monitoring of Availability & Serviceability of CNS facilities.

- Monitoring status of facilities on daily, weekly & monthly basis to check the health of main and standby equipment for improvement of serviceability & availability of facilities.
- Ensuring availability of NAV AIDS of more than 99.20% is achieved.

3.3 Framing of maintenance philosophy

Following activities are done under this heading:-

- Preparation of preventive maintenance schedules;
- Establishment of Radio Workshop;
- Outsourcing maintenance to the OEM.

3.4 Inventory management including spares

- Maintenance of Inventory records
- Finalization of spares/surplus items
- Disposal of Obsolete / surplus items.

3.5 Finalization & management of maintenance support contract

Formulation, implementation & performance monitoring of maintenance support contracts with Original Equipment Manufacturers (OEMs).

3.6 Replacement & up gradation proposals including preparation of technical specifications

CNS equipment is replaced based on the following factors:-

- life span of equipment;
- Obsolescence due to advancement of technology;
- Non availability of maintenance support from manufacturer.

3.7 NOC for construction of permanent structure in the vicinity of airport

- Finalization of NOC criteria with respect to CNS facilities.
- Scrutinizing the cases for grant of NOC for construction of new structures & Buildings in the vicinity of Airports as per ICAO provisions/CAR.

3.8 Aeronautical Information Service (AIS)

- Collection, verification, compilation & publication of Aeronautical information through AIP & AIC.
- Regular update of information through NOTAM, AIP supplement
- Publication & updating of AERADIO.

3.9 Co-ordination with ICAO

Following activities are done:-

- Coordination with ICAO regional office Bangkok for allocation of frequency for CNS facilities.
- Amendments to ICAO Annexes and Documents.
- Coordination for implementation of regional CNS/ATM plans.

3.10 Management of CNS manpower

- Placement
- Posting of CNS executives to ACS stations throughout the country
- Maintenance of data base for executing transfers
- Implementation of transfer policy

Training: Finalization of training plan in consultation with Principal CATI for :

- Training at CATI for CNS personnel on fresh recruitment
- Refresher training at CATI
- Foreign Training at Original Equipment Manufacturer (OEM) Works

Proficiency on CNS systems and equipment -Co-ordination for written and Practical examinations

- Nomination of Boards for practical examination
- Declaration of results
- Maintenance of proficiency data base
- Review of policy

3.11 Operation of communication facilities

- AFTN using AMSS
- Communication pre-flight briefing
- Co-ordination with service providers for leased lines for national & international Data/Speech circuit
- Frequency management in co-ordination with National Frequency Allocation Plan (NFAP)
- ICAO regional office
- NOC for use of frequency by other than DCA users

Documentation

- Pre-flight information Bulletin
- AFS manual

4. Roles & Responsibilities of CNS Directorate

4.1 The CNS Directorate is responsible to ensure availability & serviceability of CNS facilities installed at various airports in Myanmar by regular monitoring, provision of additional maintenance support and issuance of technical guidelines.

4.2 The CNS Directorate oversees

- Maintenance of CNS facilities in conformity with ICAO Standards & Recommended practices & national regulations with view of achieving optimum level of safety for

aircraft operations over the entire Myanmar Flight Information Region (FIR), preparation of maintenance schedules.

- Training of newly appointed CNS officers, including refresher training.
- Co-ordination with other concerned organizations in & outside Myanmar.
- Procurement of spares and inventory control,
- Component level maintenance of PCBs/ Module of various CNS Equipment through Central Radio workshop.
- Co-ordination for Flight Inspection activities as per specified schedules.

4.3 Operational Supervision

The dynamic application of supervision of maintenance of CNS facilities rests with CNS officer in charge at their respective stations where various CNS facilities are installed. The CNS officer in charge receives technical & administrative support & guidance from the CNS Headquarter.

The job description for CNS executives are given in Chapter - 10 to this manual.

4.4 CNS Staffing

The CNS Directorate is responsible to determine CNS Operational & Maintenance Staffing requirement for the country as a whole for staff planning purposes. The staff requirement is worked out taking into account.

- No. of operational shifts required to operate and attend the un-serviceability of CNS facility.
- Training and leave reserve.
- Vacancies arising due to retirement/resignation of personnel.

4.5 Provision of CNS facilities

4.5.1 The CNS facilities have been provided at

- 32 Airports
- 5 en route Aeronautical Communication Stations (ACS)
- 5 en route Navigation Stations
- 3 en route Surveillance Stations

4.5.2 The list of CNS facilities may be seen at CNS Manual Vol. VI Chapter -3.

4.5.3 The CNS facilities are maintained & operated by about 52 Electronics/Technical personnel and Communication (Operational) personnel.

5. Training on CNS facilities

5.1 Training Philosophy: -Presently personnel at the level of Radio Mechanic Trainee (RMT) are inducted in the CNS department by direct recruitment. The basic qualification of RMT is Graduate/Diploma in Engineering (Electronics & Communication). They are deputed for training at CATI (Civil Aviation Training Institute) Yangon. On Successful completion of training they are deputed to the field stations for the CNS Maintenance & Operation duties. After gaining sufficient field experience these executives are deputed for training on concept and module level maintenance and operational courses of CNS facilities. They are declared proficient after successful completion of concept and module level courses.

5.2 Training Establishments

5.2.1 Civil Aviation Training College (CATI)

The Civil Aviation Training Institute (CATI) located at Yangon is a training establishment of DCA dedicated to training in the area of Communication, Navigation & Surveillance (CNS)/ Air Traffic Management. The Institute also has a TRAINAIR unit for development of Standardized Training Packages (STPs) for various CNS /ATM courses.

5.3 Types of courses

5.3.1 The CNS Faculty at CATI conducts following types of courses

a. Initial level courses :-

- (i) Radio Mechanic (Basic Electronics Course)

b. Concept Level Courses:

- (i) VOR/DVOR
- (ii) DME
- (iii) ILS
- (iv) Primary Radar Concept
- (v) Secondary Radar Concept

c. Communication Operation Courses:-

- (i) Automatic Message Switching System (AMSS –Operations)
- (ii) Automatic Message Switching System (AMSS –System Administration)

d. Refresher Courses:-

- (i) Aeronautical Information Service (AIS)
- (ii) ILS (ii) VOR
- (iii) DME
- (iv) Primary and Secondary Radar
- (v) AMSS-Maintenance
- (vi) AMSS –Operation
- (vii) AMSS – system Administration
- (viii) Aeronautical Mobile Service (AMS)-HFRT Operation etc.

e. Other Courses:-

- (i) Data Communication & computer Network
- (ii) Automatic Dependent Surveillance (ADS) concept
- (iii) Flight Data Processing System (FDPS) concept
- (iv) Surveillance CCTV concept

f. General courses:-

- (i) Instructor Development Programme (IDP)

5.3.3 Admission Criteria at initial courses at CATI

Radio Mechanic Trainee (Electronics / Communication)

- Diploma in Telecommunication / Electronic / Radio Engineering / Elect. Engineering with specialization in Electronics OR equivalent.
- A good knowledge of English Language written & spoken

5.3.4 Course Examination at CATI: -At the end of every training Programme, the trainees have to pass a written Examination, as well as practical examination, including viva-voce.

5.4 On the job training & Proficiency

5.4.1 The CNS officers during the middle of their courses at CATI are required to undergo on-the-job training (OJT) at field stations for a specified period. After returning from OJT, the trainees are required to give a group presentation on the OJT undergone by them on CNS Equipment.

5.4.2 CATI courses: - For Module level maintenance courses, the OJT is imparted on CNS Equipment installed at CATI.

5.4.3 Proficiency through open examination: - CNS personnel are encouraged to acquire adequate knowledge and skill on the maintenance and operation of CNS facilities by self learning. For the purpose sufficient hard copies of technical manuals are provided. To ascertain their knowledge and skills, open examination is conducted which consists of:

- A written examination
- Practical & Viva-voce .CNS personnel who pass the aforesaid examination are declared proficient.

Detailed procedures for acquisition of proficiency are described in CNS Manual Vol. VI Chapter-1.11.

5.5 Annual Training Programme at CATI:- The annual training Programme of CATI is prepared by Principal CATI in consultation with HQ and Director (CNS). The training Programme is approved by DG.

5.6 Maintenance of Training Records :- Records of all trained CNS personnel at CATI are maintained in computer Data Base at CATI. A File of training record is also maintained .

Chapter - 4

Procedures for Site selection of CNS Facilities

1. General

- 1.1** The purpose of the document is to provide General guidelines for the selection of site for the installation of CNS Facilities. Detail technical information on siting criteria for CNS facilities is provided in CNS manual Vol. III. The information on criteria for issuance of NOC is described in CNS Manual Vol. VI Chapter 1.13. The detail procedure for site selection of CNS facilities is given in CNS Manual Vol. III.
- 1.2** The requirement of CNS facility at an airport or en-route station is decided in coordination among CNS Director, ATM and Planning directorate and is projected to DGDC for approval. After approval, Director CNS and Director Planning take action for its procurement.
- 1.3** After the requirement of a CNS facility at a station is approved, the process of site selection for siting the facility shall be initiated by Director CNS and Director Planning by referring it to the Siting committee.

2. Composition of Siting Committee

- 2.1 DCA HQ Siting committee:-** A DCA HQ Siting committee shall be constituted comprising the following members:
- a. One member from CNS Directorate – Team Leader.
 - b. One member from ATS Directorate.
 - c. One member from Planning Directorate
 - d. One member from General Manager (Airport), for siting at Metro Airport.
 - e. One member from concerned engineering Electrical(AEMSD), as applicable.
 - f. One member from ASSD (Aerodrome Standard and Safety Division), as applicable.

Director (CNS) will initiate action for constitution of site selection committee.

Preliminary Site Selection committee: - Director CNS shall also constitute a preliminary Site Selection committee consisting executive posted at HQ and concerned station. At least one member of committee shall be from ATM Directorate. He shall also nominate a Team Leader of the committee.

- 2.2** The Team Leader of the HQ Siting committee shall forward the required information (including maps and charts) relating to preliminary site selection committee to determine suitability of one or more probable sites.

3. Selection and Approval of Site

- 3.1** The preliminary site survey committee shall carry out the preliminary site survey and submit a detailed report to team leader of HQ Siting Committee indicating clearly the recommended site.
- 3.2** The report shall be analyzed by the HQ Siting Committee and shall recommend one of the proposed sites, if found suitable. If considered necessary, some of the HQ Siting committee shall visit the station to finalize the site.

- 3.3** On the recommendation of the Siting Committee, Director (CNS) shall formally obtain No Objection Certificate (NOC) from the concerned Directorate before conveying the approval of the selected site. The location of approved site shall be communicated by D (CNS) To D (ATS), In-charge of CNS Facilities Installation and Maintenance Branch, concerned Region and the station.
- 3.4** On receipt of location of approved Site, D (ATS) will take action for preparation of IAL procedure. D (CNS) will follow up the matter with D (ATS) for expeditious completion of the task.
- 3.5** On receipt of location of approved site, In-charge of CNS Facilities Installation and Maintenance Branch shall prepare and issue list of civil & Electrical works to concerned Station for initiating related works.

Chapter - 5

Procedure for Installation of Navigational Aids

1. General

CNS Facilities Installation and Maintenance Branch shall be responsible for carrying out installations and commissioning of Radio Communication, Navigational & Surveillance facilities at all the airports in Myanmar under the control of DCA except the turn-key projects. Installation and Commissioning of Turn Key projects will be carried out by supplier of equipment or their authorized agency.

2. List of Works

CNS Facilities Installation and Maintenance Branch shall issue detailed list of civil and electrical works on receipt of approval of selected site for the proposed facility. List of Civil and Electrical works in respect of CNS facilities under turn key projects shall be prepared in consultation with CNS directorate and executing agency.

2.1 Civil Works

The civil works related to building, grading, preparation of site, plinths for antenna systems, trenches etc. will be carried out by the management of ASSD (Aerodrome Standard and Safety Division) of DCA. The works shall be carried out by ASSD as per drawings and guidelines contained in list of works. The list of works generally consists of:

- Location of site on the grid map.
- Layout of the system.
- Details of the building.
- Details of antennas and monitor antenna foundation.
- Details of manhole.
- Grading details.
- Details for laying of RC cables.
- RF cable trenches.
- Earthing systems/pits.

2.2 Electrical works: List of Electrical works along with drawing will be sent to Electrical Engineering (VAMES) of DCA to carry out the electrical works for concerned facility. The drawing and list of works generally includes:

- Electrical load.
- Requirement of stabilizer.
- Requirements of Mains Distribution Board/Secondary Distribution Boards.
- Requirement of air conditioners.
- Light and fans.
- Mast Lights

In respect of turn key projects the Civil and Electrical works will be carried out as per agreed list of works by authorized agency indicated in agreement.

3. Installation of a facility

3.1 Installation Team: Director (CNS) will nominate a Project officer. The installation team shall be constituted by CNS Facilities Installation and Maintenance Branch and will consist of the following:

- a. Technical/Electronics executives
- b. Mast riggers
- c. Staff from mechanical section.

3.1.1 Technical Personnel from the concerned ACS will also be attached with the Installation team during the period of installation.

3.2 Installation Guide lines

3.2.1 On receipt of information by CNS Facilities Installation and Maintenance Branch about installation of CNS System, guidelines will be prepared which may consist of two parts.

3.2.1.1 General installation guidelines for the Specific CNS equipment – this will be in accordance with the installation manual supplied by the manufacturer.

3.2.1.2 Site Specific Installation guidelines: For each selected site a site specific guidelines will be prepared which will consist of information regarding equipment layout, about R.F and remote cable layout, termination boxes and other information related to the installation at the site. These guidelines will be prepared by Installation Team.

3.2.1.2.1 Project Officer will constitute an installation team and provide them manufacturer's manuals, installation guidelines to facilitate advance preparation for the installation.

3.2.1.2 Project Officer shall issue site-specific instructions and guidelines to installation team for carrying out the installation. The guidelines shall comprise the following:-

- a. Procedures for installation CNS equipment at local site.
- b. Procedures for testing of equipment.

3.2.2.1 Installations of minor CNS System:

Director (CNS) after due coordination and consultation with Deputy Director (CNS) may authorize Station to undertake installation of minor equipment such as VHF TX/Rx, Voice logger equipment etc. CNS Facilities Installation and Maintenance Branch shall provide installation guidelines and offer assistance, if requested by the station.

3.3 Commissioning Flight Inspection

3.3.1 For commissioning of a CNS facility which requires flight inspection following action shall be taken:-

- (i) After completion of ground tests and adjustments of facility under installation as per Equipment manual and DOC 8071, coordination shall be done with Flight Inspection Unit (FIU) for flight inspection of the facility.

- (ii) The facility shall be flight inspected and certified by FIU as per Doc 8071 and CNS Vol. IV.
- (iii) After the flight inspection of the facility, all equipment parameters and field readings shall be recorded and preserved for future reference and comparison during maintenance.
- (iv) Debriefing reports of the facility are to be taken regarding performance of the facility from the users.

3.3.2 For commissioning of a CNS facility which does not require flight inspection following action shall be taken:-

- (i) After completion of ground tests and adjustments of facility under installation as per Equipment manual, all equipment parameters and field readings shall be recorded and preserved for future reference and comparison during maintenance.
- (ii) Debriefing reports of the facility are to be taken regarding performance of the facility from the users.

3.3 Handing over of facility

3.3.1 On completion of the flight calibration, the facility shall be handed over to the station as per guidelines given in handing over sheet. The Officer-in-Charge, ACS shall verify the parameters and field readings recorded in the Handing over sheets. Clarifications, if any, will be sought by him from the Installation Team and shall take over the facility after fully satisfying him with operational parameters and quality of installation.

3.3.2 The facility which does not require flight calibration will be handed over after satisfactory debriefing reports.

3.3.3 The handing over report shall be signed by the station-in-charge or his nominee and the in-charge of the Installation team.

3.4 Handing over of the facility installed on Turn Key basis

For CNS facility which has been installed on turn key basis a System Site Acceptance Test (SSAT) shall be carried out as per pre agreed procedure. On successful completion of SSAT the facility shall be handed over to the station.

3.5 Commissioning of Navigational and Surveillance Facility

Once the site of installation of N & S facility is approved, a parallel action is taken by D (FIU & CNS) for installation and flight inspection of the facility and by D (ATM) for preparation of IAL procedure. By the time the facility is installed and flight inspected, IAL procedure is prepared and kept ready by ATM directorate.

On receipt of information about the successful flight inspection of the facility, the IAL procedure is forwarded to DGCA for carrying out the flight trials by Airline operator. On completion of flight trials, and approval by DGCA, the Navigation and Surveillance facility is commissioned by issuance of suitable Notam.

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Chapter - 6

Document Availability and Control at the Station

1. Standards

The stations shall keep those documents that are necessary as basic references for the CNS services and functions.

1.1 The documents that shall be required are:

- a. CNS Manual Vol. I to VII.
- b. Relevant Volumes of ICAO Annex 10 Vol. I to V, Annex XI and Annex XV.
- c. DOC 8071, DOC 8400, DOC 7169, DOC 8259, DOC 9684, DOC 9688, DOC 9705
- d. Myanmar Civil aviation Requirement in respect of CNS facilities as notified by DGCA.
- e. Other required documents which may be station and service specific.
- f. Station CNS manual containing the following :-
 - (i) Human Resource: (Describing Name, Designation, Proficiency Held by CNS personnel, their deployment in general maintenance / shift operations.)
 - (ii) Technical description: giving details of the following:
 - The kind and location of each facility.
 - The technical specification of each kind of facility;
 - How each facility interconnects with any other facility or service?
 - The way in which the service provider monitors each facility to ensure that it is operating in accordance with its technical specifications.
 - (iii) Safe Operation: describing the following:
 - the procedure that records the way in which each CNS service and each related facility is configured at any time.
 - the procedure to be used to monitor the performance of each Service and facility, and to compare the results with the appropriate technical specification.
 - The procedure to be used if a service fails or a facility fault occurs, including the way in which the failure or fault is to be reported and rectified.
 - The procedure to be used to report and rectify any defects found during operation and maintenance of the facility.
 - The procedure to be used to :
 - Detect and correct any latent defects in equipment.
 - Change in soft-ware to adapt to any changes to the configuration of hardware.
 - Change the design of equipment or facility to adapt to any change to the functional or technical specification.
 - (iv) Facility operation and maintenance plan: describing for each kind of facility, an operation and maintenance plan that includes the following:-

- The procedures for maintenance, including the procedures used for repair;
 - A description of the system used to schedule maintenance;
 - The interval between performance inspections and the method used to determine the interval;
 - A copy of the operating and maintenance instructions for the facility;
 - An analysis of the workload of Maintenance Personnel and key personnel that take into account the numbers of these people and their qualifications
 - If one or more flight inspections are necessary;
- (v) Interruption to service: describing the following:
- the procedure to be used if an Aeronautical Communication or Radio navigation or surveillance service is interrupted .
 - Specify an acceptable recovery time for each service.
 - The procedure to be used if the acceptable recovery time of a service is exceeded.

2. Document and Data Control Processes

2.1 Standards

2.1.1 Control of Documents

- a. The authority to control, amend and publish the CNS manual shall Rest with the Director (CNS) at DCA Headquarter.
- b. The Officer-in-Charge, ACS shall control and amend the station CNS Manual.
- c. Only the authenticated current versions of the documents shall be maintained by the officer-in-Charge, ACS.
- d. A master copy of all the documents shall be securely held.

2.1.2 Instructions and documents issued by DCA pertaining to CNS manual shall be Placed in the respective CNS manual.

3. Study of Station CNS Manual by executives posted at the station

Officer-in-Charge, ACS shall ensure that each executive posted at a station studies and comprehends the Station CNS manual within a period of one month from the date of reporting at the station. For this purpose a copy of station CNS Manual shall be made available. A certificate from the executive shall be obtained stating clearly that he has read and understood all the provisions of Station CNS Manual.

Chapter - 7

Record Systems related to Maintenance of Facilities

1. General

- 1.1 Adequate and accurate records are necessary elements of a safety management of the system. Every station is required to have a Record System to identify, collect, index, store and maintain records necessary to provide a traceable history over the complete life cycle of services and facilities. The record kept shall include the following:
- a. Records of Installations, initial testing, commissioning and re-commissioning of the facility as prepared by the Installation team of RCDU and handed over to the station while handing over the facility / equipment to the station.
 - b. Records of flight inspection results in respect of commissioning and periodic Checks of facility/facilities
 - c. History of maintenance: consisting of daily, weekly, Monthly, quarterly/six monthly and yearly maintenance (as applicable) carried out on each equipment
 - d. Site log-books:
 - shall be maintained for each facility;
 - shall indicate date and time of updated occurrence of each activity;
 - shall be signed by the personnel carrying out the activity and shall be countersigned by the unit in-charge;
 - e. Fault log-book containing following details shall be maintained for each CNS facility / service:
 - date and time of occurrence of fault.
 - observed indication of fault.
 - Full technical details of fault analysis, diagnosis and rectification procedure.
 - date and time of repair
 - f. History of Maintenance showing date, time occurrence, type of fault, Corrective action and expenditure incurred. This may be compiled on monthly basis.
 - g. Records of Test equipments used in maintenance along with their Calibration dates.
 - h. Records of unserviceable modules/PCBs for repair and return to Special Maintenance Units (SMUs).

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Chapter - 8

Performance Targets for CNS Facilities (Availability and Reliability Standards for CNS Facilities)

1. Introduction

The monitoring and analysis of in-service performance of CNS facilities against design specification and operational requirement is a key activity in assuring the integrity and safety of service.

This specification identifies the availability and reliability standards applicable to Radio Navigation Aids provided by DCA, Myanmar.

These standards provide a reference level of service against which facilities are designed and delivered. The performance of technical assets is monitored, reviewed and reported against these standards.

The standards help to ensure that safety critical services are being delivered to an appropriate standard.

2. Purpose

2.1 This document sets out the key requirements, principles, and standards applying to CNS Facilities.

2.2 The values for each of the following basic parameters, as relevant to each service type, shall be checked and calculated for analysis, review and corrective action.

3. Process

3.1 To review the performance targets for each facility, every station is required to generate the following:

a) **Availability:** This performance parameter is to be calculated for duration of one calendar year i.e. From 1st Jan to 31 December.

b) **Mean Time between Failures (MTBF):-** This parameter is to be calculated for

- i) each channel of the facility.
- ii) For the complete facility.

MTBF is to be calculated separately for each channel of the facility and for the complete system which may be having redundancy.

3.2 The aforesaid parameters are to be calculated as per method described in Para 4.1 and 4.2 of this document.

3.3 The report shall be submitted to DD (CNS) by **15th January** every year.

4. Performance measures to be applied

Minimum Facility Operational Availability (A_o) and Reliability (MTBF) standards are quoted in recognition that both frequent failures (low MTBO) and long outages (low FA) are operationally undesirable.

For Precision Landing navigation aids, these standards come from ICAO Annex 10.

For Non-Precision navigation aids, the quoted MTBO figures are recommendations only based on aviation experience.

ICAO Attachment F to Annex 10 Volume 1 provides guidance material concerning the level of reliability and availability for radio communication service and radio navigation aids, which may be considered as minimum standards.

Following table provides values of the performance parameters for a number of service types. Efforts should be made to achieve the quoted values.

Service	Availability	Reliability(MTBF)	Continuity
Aeronautical Broadcasting Service	> .992	>1000 hours	15 sec.
Aeronautical Mobile Service (ATC A/G comms.)	> .992	>10000 hours	Immediate
Radar Data Display for ATC	>.992	>1000 hours	Immediate
ILS Localizer and Glide Path	>.992	>1000 hours	Immediate
DME	>.992	>1000 hours	Immediate
VOR	>.992	>1000 hours	Immediate
NDB	>.992	>1000 hours	Immediate

4.1 Availability

All aeronautical telecommunication and radio navigation services must provide high level of operational availability. In many cases, achievement of the necessary availability levels will require the use of design features such as redundancy and/or duplication of facilities, automatic changeover from main to standby facility in the event of a fault, remote monitoring and maintenance capability including remote configuration, remotely actuated equipment recycling capability, dial-up monitoring, etc.

Availability is a measure of the operational availability of the system to users over the total time period that is required by users. It is normally quoted over the period of an average year or longer, and takes into account the time the service will be unavailable as a result of both unscheduled failures and scheduled or unscheduled maintenance.

Definition: The ratio of actual operating time to specified operating time.

4.1.1 Availability Calculations:

$$A_o = T_a/T_t \quad \text{Where;}$$

A_o = Operational Availability,
 T_a = the total time that the service is actually available, and
 T_t = the total time period that the service is required to be available.

1. It may be noted that the total time (T_t) includes non operating time. Non operating time consists of scheduled shutdown period and failure period.
2. Facilities at some of the station are not operated on H24 basis due to limited hours of operation of the station. For such facility time T_t will not include the period during which facility is switched off or not provided.
3. The availability is to be calculated for a period of one calendar year.

A major factor in achieving required levels of (A_o) is the provision of standby Power system. Standby power systems may take the form of Diesel No-Break Generating sets, Diesel standby Generating sets, floating battery supply across a mains charger, or Uninterruptible Power Supplies with battery back up to mains supply. For remotely located facilities having relatively low power requirements, solar power supplies used in conjunction with floating batteries may be a satisfactory solution.

Important: - Factors important in providing a high degree of facility availability are:

- a) facility reliability;
- b) equipment designs providing good component accessibility and maintainability;
- c) quick response of maintenance personnel to failures;
- d) adequate training of maintenance personnel;
- e) efficient logistic support;
- f) provision of adequate test equipment;
- g) standby equipment and/or utilities

As indicated at g) above, provision of standby power is necessary for many Aeronautical Telecommunication and Navigation services and facilities where continuity of service is a critical requirement. Critical Aeronautical Telecommunication and Navigation facilities that must have no-break standby power supply systems to ensure continuity are those in the following classes:-

- (a) all control tower facilities;
- (b) all terminal area radar surveillance systems;
- (c) all terminal area precision and non precision approach Nav aids;
- (d) all terminal area air / ground VHF communication systems;
- (e) all radio bearers / networks and stations servicing any CNS system(s) used for terminal area control;
- (f) all en-route communication systems; including all satellite communication ground stations used for ATS voice and data and
- (g) all en-route radar facilities.

- 1) Station maintenance personnel are to take adequate, effective and timely action with regard to points b), c), d), e), f) and g).
- 2) CNS planning directorate is to take action with regard to points a) and b) while procuring CNS equipments.

4.2 Mean time between failures (MTBF)

MTBF is The actual operating time of a facility divided by the total number of failure of the facility during that period of time.

- 1) the operating time is in general chosen so as to include at least five ,and preferably more, facility failures in order to give reasonable measure of confidence in the figure arrived.

- 2) This parameter is to be calculated for each channel and for the complete facility.

4.2.1 MTBF calculation

T- Total time for five failures of the channel.

$$\text{MTBF} = T/5$$

If total number of failure is less than five in a calendar year, M.T.B.F need not be calculated by station and only the number failures in the calendar need be sent.

It may be seen at 4.3 that adjustment of MTBF will produce the desired degree of reliability. Factors which affect MTBF and hence facility reliabilities are:

- a) Inherent equipment reliability;
- b) Degree and type of redundancy;
- c) Reliability of the serving utilities such as power and telephone or control lines;
- d) Degree and quality of maintenance;
- e) Environmental factors such as temperature and humidity

Important

- 1) The contribution of station maintenance personnel to increase MTBF is particularly on account of c), d) and e) above and hence proper, effective and timely action should be taken in this regard.
- 2) With regard to items at a) and b) CNS directorate will take action to procure equipment having high reliability and adequate redundancy.

4.3 Reliability

Reliability is the probability that the ground installation operates within the specified tolerances.

4.3.1 Calculation

The reliability R in percentage is given by

$$R = 100 e^{-t/m}$$

Where; e = base of natural logarithms
t = time period of interest
m = MTBF

It may be seen that reliability increases as MTBF increases. For high degree of reliability and for operational significant values of t, we must have a large MTBF. Let us see following examples:

The reliability for 24 hrs of operation for 1000 hours of MTBF calculated from the above formula is approx 97.5 % i.e the likely hood of facility failure during 24 hrs period is 2.5%.

Note that the reliability figure for 1000 hrs for the same MTBF of 1000 hrs will be 37%.

It is important to note that the reliability (probability of surviving) for a period of time equal to MTBF is only 0.37 thus MTBF is not a failure free period.

Reliability should be calculated for both individual facilities, and for the total population of a particular type. Calculating both values provides information on the type as a whole, and also allows identification of individual facilities which may be under performing.

4.3.1 Action at Corporate headquarter

Calculation: To be done at DCA HQ

$$\text{MTBF of Individual Facility} = \frac{\text{Total time period/ number of failures}}{\text{During time period}}$$

This data will be forwarded by individual station for each type and model of equipment.

Based upon data made available by the station, MTBF of Total Population Of particular Type and model of equipment

$$\text{M.T.B.F} = \frac{\text{Total time period*population/ Number of failures of all equipment of the population during time period.}}$$

4.4 Continuity

Where a service has duplicated or redundant facilities (including standby power supply) with automatic changeover or automatic or remote configuration, or main/standby capability, an additional parameter termed '**continuity**' should also be quoted. '**Continuity**' is a measure of time that a service takes to changeover from the main to standby facility, or to reconfigure itself following a fault, including a power supply fault or failure.

Services for which continuity is required to be quoted include precision Nav aids, radar display services for ATC, A/G communication channels for ATC, point to point data and communication links.

4.5 Integrity

This is a measure of the ability of the service to provide a warning to users when the service should not be used, or when the error has occurred in the data transfer or computation. Integrity may be computed and presented in a variety of ways, e.g., as a Go/No Go warning based on internally measured parameters that utilize built-in test equipment or self monitoring systems. Integrity values for radio navigation services are often stated as a probability of the loss of integrity over a number of events.

Station maintenance personnel are to ensure that Navigation, surveillance and other facilities in which such capability is provided in the equipment, change over or shut down occurs in the event signal in space parameters or other operational parameters are out of tolerance. Non occurrence of above, if reported/detected shall be investigated, immediate corrective action taken and full reports to this effect sent to corporate headquarters.

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Chapter - 9

Maintenance of CNS/ATM Systems

1. Introduction

CNS Directorate ensures provision CNS facilities as per Standard and Recommended practices of ICAO. Civil Aviation Requirements (CARs) promulgated by DG DCA to, support CNS/ATM system for continental and Oceanic airspace managed by Myanmar. This includes maintenance of CNS/ATM assets.

The CNS Directorates are:

- Navigation
- Surveillance
- Communication (Voice)
- Communications Operations
- Maintenance Unit
- Central Radio Workshop

With support from:

Aerodrome Standard and Safety Division (ASSD)
Administration and Planning Division

And in coordination with

Air Navigation Safety Division
Air Traffic Services
Aeronautical Electrical and Mechanical Safety Services

2. Working Arrangements

CNS groups work together, and with other Directorates of DCA to assure safe and effective management and delivery of CNS Services.

3. CNS Executive Team

CNS operation/maintenance is managed by an Executive Team headed by the DD (CNS) and includes all Executive Engineer. The Executive Team meets periodically as required. The Executive undertakes the following specific tasks:

- develop, define, prioritize and promulgate strategic directions for CNS operation/maintenance on a continuing basis;
- monitors performance against objectives in the areas of CNS operations, and human resources;
- provides a focus for problem resolution and provides leadership for Group staff as a whole;
- reviews overall Directorate achievement against aims and objectives and agrees the need to undertake corrective or enhancement activities where required;
- develops programs for the most effective utilization of resources, whether they be human or equipment and facilities,
- to undertake all activities according to their priority;
- monitors and manages the effectiveness of CNS operation/ maintenance Management System by ensuring compliance with DG DCA regulatory

requirements and standards, and DCA's own performance standards; and communicates the aims and objectives to staff.

The Executive Team is responsible for:

- provision of strategy and policy advice on process areas associated with safe life cycle management of the national CNS system;
- identification and progression of initiatives to improve any aspect of management of the national CNS systems; and
- resolution of issues which have been referred to the team by Stations.

4. Communication, Navigation and Surveillance Sub-Division

4.1 Role

The primary role of each CNS sub-division is to provide assurance to the DD(CNS) of the operational integrity of existing CNS systems and facilities.

These sub-division provide in service support and management of the facilities to assure safe and effective operation, services in accordance with:-

- ICAO SARPS
- Myanmar Aircraft Acts & Rules
- MCARs of DG DCA,
- Standards and practices of DCA.

This activity extends from commissioning, upon hand-over from CNS Directorate. To meet operational and administrative needs, the telecommunication services are provided either through internal resources or through external communication service providers.

To provide necessary telecommunications services that meet the operational and administrative needs, either internally owned and maintained or by using external services.

Director CNS delivers development, system management, maintenance standards and instructions, and maintenance services for the following systems:

- Navigation aids (ILS, VOR, DME, NDB);
- Surveillance Systems (Primary & Secondary Radar sensors, ADS-C and ADS- B)
- Air-Ground communications (Voice Communication Switching System (VCSS), VHF, HF, Data communications);
- Ground-Ground communications (Voice);
- Operational telecommunications AFTN (Data) and ATN (Network components & AMHS);
- Airport Security systems
- Terminal Public Address and Information Systems

Following are the Major tasks of CNS Directorate:

- Ensuring availability of CNS facilities as per MOU target.
- Posting of CNS personnel at various ACS.
- Review of CNS staff strength for each ACS.
- Ensure timely procurement of spares.
- Development and updating the CNS Manual.
- Coordination of Technical Training & Proficiency program of CNS personnel.
- Ensure timely calibration of CNS personnel at ACS.

4.2 Products and Services

- CNS system management, operation, and maintenance management;
- System management, and specialist Systems Engineering relating to the above systems;
- Specialist CNS Authority services relating to the above systems;
- Collection and record of CNS facility performance including system availability
- Technical maintenance for CNS facilities including, Communication, Navigation Surveillance ATM automation systems;
- Test equipment calibration & maintenance;
- Technical Training and Proficiency.
- Flight Inspection (via a separate unit)
- Telecommunications Network design, implementation, management and support
- Telecommunications networks providing voice and data circuits
- Frequency Spectrum management;
- Liaison with ICAO and the aviation industry.
- Maintaining a Facility List baseline of the CNS system assets

4.3 Key Relationships

(i) Internal

- DG DCA
- Air Navigation Safety Division
- ATS Directorate
- Aerodrome Standard and Safety Division
- Administration and Planning Division

(ii) External

- Other aviation related businesses and other CNS service providers, including other ATM providers;
- Defense (For maintenance of CNS facilities installed at Defense airfields)
- State & Local Government Departments, local authorities
- External suppliers of technical and engineering resources
- Airlines,
- Communication service providers such as SITA, and others
- Post and Telecommunications Department of Ministry of Telecommunications, Posts and Telegraphs

4.4 Composition

Led by a safety orientated senior executive, with an engineering/technical focus with the relevant experience and qualifications;

Supported by qualified technical staff at DCA Headquarter and stations, expert in delivering engineering, project management, installation and maintenance services, organized by customer, geography and function.

Also supported by staff needed for business support (finance, staff management, industrial relations and planning).

Staff who understands the competitive telecommunications environment and how that can be best exploited to reduce DCA costs.

4.5 Job Description

Job description of key CNS (Operation and Maintenance) executives is given in chapter 10.

Chapter - 10

Job Description of CNS Division

1. Director (CNS)

(i) Title: D (CNS)

(ii) Job Summary:

He is head of CNS-Operation and Maintenance department and is placed at headquarter building of DCA, Myanmar. He monitors daily Un-serviceability reports of CNS facilities and directs corrective action. He reviews maintenance policies of all CNS facilities installed at Aeronautical Communication Stations and requirement of CNS personnel for existing and planned facilities, coordinate for timely procurement of spares, finalize annual training plan of CNS personnel for training at CATI. He recommends proposal for annual transfer of CNS personnel to various ACS. He exercises administrative and financial powers as per delegation of power.

(iii) Duties and Responsibilities:

Maintenance and operation

- Framing of maintenance policies and supervision to ensure maintenance of CNS /ATM systems and Airport Security Systems is according to the requirements of the DCA MCARs, ICAO SARPS and DCA's CNS Manual;
- Establishing effective system for identifying, reporting, tracking and removal of faults in CNS Systems and Airport Security Systems to ensure timely restoration of the facility;
- Ensuring that maintenance policies, procedures and systems are in place to guide and support the field level CNS personnel by issuance of CNS circular to this effect;
- Yearly review of CNS manuals;
- Initiation of corrective action for reported shortcomings in CNS/ATM systems;
- Monitoring and follow up action to ensure availability, reliability, continuity and integrity of CNS/ATM systems as per their performance target;
- Coordination and issuance of direction for timely procurement of spares for CNS systems;
- To ensure provision of reliable telecommunications system for Voice and Data communication required as per DGCA CARS, ICAO SARPS and DCA requirements for safe and efficient ATM either internally or through external telecommunication service providers;
- Co-ordination with ICAO and its Regional office for implementation of Regional Air Navigational Plans and Frequency management in co-ordination with WPC Wing, Department of Telecommunication;

- Coordinate for Civil Aviation frequency protection/requirements in National Frequency Allocation Plan (NFAP) and ITU World Radio Conference through WPC Wing, Department of Telecommunication;
- Advance Planning for replacement/ augmentation of CNS/ATM facilities based on the life cycle of systems, availability of manufacturer support and change of technology;
- To Ensure adherence to safety management requirements of the CNS/ATM systems and Airport Security systems;

Training and Proficiency

- finalize annual training plan of CNS personnel for training at CATI
- Supervision of Proficiency scheme of CNS personnel.

Administrative Action

- To recommend proposal for transfer of CNS personnel as per operational requirement and DCA's transfer policy;
- To takes actions to promote harmonious relation among the employee;
- To take administrative action to maintain discipline.

(iv) Financial Activities

- To exercise financial requirement to accord administrative and expenditure sanctions to support maintenance of CNS facilities;
- To recommend proposals which are beyond his powers and forward to superior authorities for obtaining expeditious approval;
- To ensure preparation of annual budget of various sections functioning under CNS branch.
- To follow vigilance guidelines and promote culture of honesty and transparency in discharging official function;

(v) Additional works

To carry out additional works assigned to him by superior authorities.

2. Deputy Director (CNS)

(v) **Title: DD (CNS)**

(v) **Job Summary:** He is entrusted with the task of ensuring maintenance and operation of Communication systems, Navigational Aids, Surveillance systems, according to Civil Aviation Requirement of DGCA, ICAO Annex 10 and maintenance of ATC Automation system, Airport Security and equipments. Monitors daily Un-serviceability reports of CNS facilities installed at Aeronautical Communication Stations and project requirement of CNS personnel for existing and planned facilities, initiate for timely procurement of spares. Assist in finalizing annual training plan of CNS personnel for training at CATI. Associate in preparation of proposal for annual transfer of CNS Technical and Electronics discipline personnel within CNS wing to various ACS. Carry out related administrative and exercises financial powers as per delegation of power.

(v) **Duties and Responsibilities:-**

Maintenance and operation

- Assist in framing of CNS maintenance policies and supervision systems to ensure maintenance of Communication, Navigation and Surveillance systems according to the requirements of the CAR of DGCA, ICAO SARPS and DCA's CNS Manual;
- Monitoring and follow up action to ensure availability, reliability, continuity and integrity of Communication, Navigation, surveillance, ATC Automation and airport security systems.
- Associate in preparation of CNS circulars to provide suitable guidelines to station maintenance personnel.
- Associate in yearly review of CNS manuals.
- Initiation of corrective action for reported shortcomings in Communication, Navigation Surveillance, ATM automation systems and Airport Security systems.
- Coordinate for calculation of MTBF for total population of each model of Communication, Navigation, Surveillance equipment, reliability and availability of CNS facilities;
- Co-ordination with ICAO and its Regional office for implementation of Regional Air Navigational Plans;
- Recommendation for replacement/ augmentation of Communication, Navigation, Surveillance, ATM automation systems and Airport Security systems based on the life cycle of systems, availability of manufacturer support and change of technology;
- Scrutinize proposal for issuance of No Objection certificate for construction of all structures in the vicinity of airports from CNS point of view;
- Ensure adherence to safety management requirements of the CNS/ATM systems;
- Ensuring CNS operations and performance related issues are reported in a timely manner to the D (CNS).

Training and Proficiency

- Preparation of annual training plan of CNS personnel for training at CATI;
- Initiating action for written and oral test for award of Proficiency of CNS personnel;
- Review performance of proficient personnel for their ability to perform maintenance job;

Administrative Action

- Recommend proposal for transfer of Technical and Electronics personnel as per operational requirement and DCA's transfer policy.
- Takes actions to promote harmonious relation among the employee.
- Takes administrative action in CNS Directorate to maintain discipline.

(v) Financial Activities

- To exercise financial requirement to accord administrative and expenditure sanctions to support maintenance of CNS facilities;
- To recommend proposals which are beyond his powers and forward to superior authorities for obtaining expeditious approval;
- To ensure preparation of annual budget of various sections functioning under CNS branch.
- To follow vigilance guidelines and promote culture of honesty and transparency in discharging official function;

(v) Additional works

Carry out additional works assigned to him by superior authorities

3. **Executive Engineer (Communication)**

(i) Title: EE (Communication)

(ii) Job Summary:- He is entrusted with preparation of maintenance schedule, monitoring of preventive and break down maintenance reports of Communication Systems received from stations, coordinate for projection of requirement of spares of Communication Systems for their timely procurement, working out Communication personnel deployment as per DCA transfer policy, carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-

Maintenance

- To initiate action for preparation of preventive maintenance schedules of newly procured and installed communication Systems at the stations and after the approval of maintenance schedule, disseminating of same to the concerned stations for implementation;
- To initiate action for CNS circulars to be issued from time to time to the stations for all the issues which require uniform implementation related to Communication Systems;
- Carry out review of faults report in respect of communication Systems being received from stations and to take up suitable preventive/corrective action.
- To take action for keeping the Availability of communication Systems at all Stations.
- To initiate timely actions for renewal of maintenance contracts of Communication Systems facilities.
- Carry out annual evaluation of the performance of communication Systems in respect of all stations and recommend to DD (CNS) actions to improve their performance or replace them if service life exceeds its specified life time;
- To assist DD (CNS) in taking further action on survey reports of decommissioned and discarded Communication Systems.
- To take action for early commissioning of newly installed communication systems at stations.
- To take action on the reports received from stations and to present relevant reports to DD (CNS);
- To initiate corrective actions on the aviation safety reports of field stations
- Ensuring Communication system operations and performance related issues are reported in a timely manner to the DD (CNS).

Training

- Organize actions to work out requirement of annual training for maintenance personnel of communication Systems.

Administrative Functions

- To initiate proposal for transfer of Communication (Operational) discipline personnel as per operational requirement and transfer policy of DCA and submit same to DD (CNS).
- If required, takes administrative action on the personnel working under him to maintain discipline.

(iv) Financial activities

- Report Project requirements of Communication Systems to DD (CNS) for incorporation in annual budget.
- Follow vigilance guidelines and promote culture of honesty and transparency in discharging official functions.

(v) Additional works

Carry out additional works assigned by superior authorities.

(vi) Knowledge, experience, skills and abilities

- Posses proficiency or trained at concept level on communication Systems;
- Should have working experience of at least two years on Communication Systems;
- Have knowledge of all maintenance schedules and CNS circulars related to Communication Systems;
- Possess sound knowledge of Annex 10 Vol. II, III, IV, V and relevant ICAO Docs. and related Civil Aviation Requirement (CAR) of DGCA;
- Have the working knowledge of DCA disciplinary and appeal rules;
- Should be able to dictate letters in English;
- Have ability to carry out correspondence in English through E-mail;
- Have good knowledge of working with computer and able to use window operating system and utilities like MS office and internet for obtaining information of interest;
- Have the ability to clearly express his views in English;
- Able to make presentation, preferably through power point of related topics to higher authorities and to gatherings;
- Maintain good working relationship with higher authorities;
- Should have understanding and knowledge about basic ATC operations;
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them.

4. **Executive Engineer (Navigation)**

(i) **Title: Executive Engineer (Navigation)**

(ii) **Job Summary :-** Initiating preparation of maintenance policies, maintenance schedules, monitoring of preventive and break down maintenance reports of Navigational Aids received from stations, coordinate for projection of requirement of spares of Navigation Aids for their timely procurement, carry out associated administrative functions and any other works assigned to him.

(iii) **Duties and Responsibilities:-**

Maintenance

- To initiate action for preparation of Preventive maintenance schedules of newly procured and installed Navigation Aids and after the approval of maintenance schedule, disseminating of same to the concerned for implementation;
- To initiate action for CNS circulars to be issued from time to time to the stations to all the issues which require uniform implementation related to Navigation-Aids;
- Carry out review of faults report analysis in respect of Navigation-Aids being received from stations and to take up suitable preventive/corrective action, e.g. with manufacturer for recurring faults at all the stations, change in maintenance practices etc. in consultation with DD (CNS);
- To assist DD (CNS) in taking action for keeping the Availability of Navigation-Aids at all stations as per availability target by:
 - (a) monitoring the repair of Modules of the Navigation – Aids for all stations
 - (b) monitoring dispatch of required spares to stations from HQ;
- Carry out annual evaluation of the performance of Navigational facilities in respect of all stations and recommend to DD (CNS) actions to improve their performance or replace them if service life exceeds its specified life time;
- To assist DD (CNS) in taking further action on survey reports of decommissioned and discarded Navigational Aids equipment.
- To review the flight inspection periodicity of all Navigation - aids and to take up with FIU in consultation with DD (CNS) for timely completion of flight check.
- To take action at HQ for early commissioning of installed Navigation - aids at stations.
- To supervise that current data base regarding Navigation - aids is maintained at HQ in all aspect;.
- To take action on the reports received from stations/regions and analyze the same and to present relevant data and report to DD (CNS);
- To participate in Technical evaluation committees, Technical specifications committees and other technical committees in respect of Navigation – Aids and other CNS Systems;
- To initiate corrective action on the aviation safety reports of field stations received from DCA/Aviation Safety Directorate in respect of Navigation aids.
- In case of Major break down of Navigation - Aid at the stations to coordinate with Navigational maintenance persons and FIU for early restoration of facility.
- Ensuring Navigational system operations and performance related issues are reported in a timely manner to the DD (CNS).

Training

- Organize actions to work out requirement of annual training for maintenance personnel of Navigation Aids at the stations and present relevant data.

Administrative Functions

- Conducts interactive meeting with Navigation Aid staff at least once every month and take follow up action to implement actionable points of the minutes of meeting.
- If required, takes administrative action on the employees working under him to maintain discipline.

Financial activities

- Projected requirements of Navigational aid to DD (CNS) for incorporation in annual budget of CNS Directorate.
- Follow vigilance guidelines and promote culture of honesty and transparency in discharging official functions.

(iv) Additional works

Carry out additional works assigned by superior authorities.

(v) Accountability

He is accountable to DD (CNS).

(vi) Knowledge, experience, skills and abilities

- Posses proficiency or trained at concept level on Navigation – aid facilities.
- Should have working experience of at least two years on Navigation – aid facilities.
- Have knowledge of all maintenance schedules and CNS circulars related to Navigation Aids.
- Possess sound knowledge of Annex 10 Vol I , Vol V, Doc 8071 and related Myanmar Civil Aviation Requirement (MCAR) of DCA, Myanmar.
- Have working knowledge of DCA financial management system
- Should be able to dictate letters in English
- Have ability to carry out correspondence in English through E-mail
- Have good knowledge of working with computer and able to use window operating system and utilities like MS office and internet for obtaining information of interest.
- Have the ability to clearly express his views in English
- Able to make presentation, preferably through power point of related topics to higher authorities and to gatherings.
- Should have understanding and knowledge about basic ATC.
- Maintain good working relationship with higher authorities.
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them.

5. Executive Engineer (Surveillance)

(i) Title: Executive Engineer (Surveillance)

(ii) **Job Summary** :- Initiating preparation of maintenance schedule, monitoring of preventive and break down maintenance reports of Surveillance Systems received from stations, coordinate for projection of requirement of spares of Surveillance Systems for their timely procurement, carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-

Maintenance

- To initiate action for preparation of preventive maintenance schedules of newly procured and installed Surveillance Systems at the stations and after the approval of maintenance schedule disseminating of same to the concerned stations for implementation;
- To initiate action for CNS circulars to be issued from time to time to the stations to all the issues which require uniform implementation related to Surveillance Systems;
- Carry out review of faults report in respect of Surveillance Systems being received from stations and to take up suitable preventive/corrective action e.g. with manufacturer for recurring faults at all the stations, change in maintenance practices etc. in consultation with DD (CNS);
- To take action for keeping the Availability of Surveillance Systems at all stations.
- Carry out annual evaluation of the performance of Surveillance Systems in respect of all stations and recommend to DD (CNS) actions to improve their performance or replace them if service life exceeds its specified life time;
- To assist DD (CNS) in taking further action on survey reports of decommissioned and discarded Surveillance Systems for processing at HQ level;
- To take action for early commissioning of newly installed Surveillance Systems at stations by coordinating at HQ level;
- To supervise that current data base regarding Surveillance Systems is maintained at HQ in all aspects;
- To take action on the reports received from stations and to present relevant data and reports to DD (CNS);
- To participate in Technical evaluation committees, Technical specifications committees in respect of Surveillance and other CNS Systems;
- In case of Major break down of Surveillance systems at the stations to coordinate with HQ and external agencies/contractors for technical help for early restoration of facility.
- Ensuring Surveillance system operations and performance related issues are reported in a timely manner to the DD (CNS).

Training

- Organize actions to work out requirement of annual training for maintenance personnel of Surveillance Systems at the field stations.

Administrative Functions

- To initiate proposal for transfer of CNS Technical and Electronics discipline personnel as per operational requirement and transfer policy of DCA, Myanmar and submit to DD (CNS).
- If required, takes administrative action on the personnel working under him to maintain discipline.

Financial activities

- Project requirements of Surveillance Systems to DD (CNS) for incorporation in annual budget of CNS Directorate.
- Follow vigilance guidelines and promote culture of honesty and transparency in discharging official functions.

(iv) Additional works

Carry out additional works assigned by superior authorities.

(v) Accountability

He is accountable to DD (CNS).

(vi) Knowledge, experience, skills and abilities

- Posses proficiency or trained at concept level on Surveillance Systems;
- Should have working experience of at least two years on Surveillance Systems;
- Have knowledge of all maintenance schedules and CNS circulars related to Surveillance Systems;
- Possess sound knowledge of Annex 10 Vol. I, III, IV, Doc 8071 and related Civil Aviation Requirement (CAR) of DGCA;
- Have working knowledge of DCA, Myanmar financial management system;
- Should be able to dictate letters in English;
- Have ability to carry out correspondence in English through E-mail;
- Have good knowledge of working with computer and able to use window operating system and utilities like MS office and internet for obtaining information of interest;
- Have the ability to clearly express his views in English;
- Able to make presentation, preferably through power point of related topics to higher authorities and to gatherings;
- Maintain good working relationship with higher authorities;
- Should have understanding and knowledge about basic ATC;
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them.

6. Executive Engineer (Maintenance)**(i) Title: - EE (Maintenance)**

(ii) Job Summary:- Supervision of preventive and break down maintenance of CNS/ATM system facilities, Airport Security equipments and associated facilities of Aeronautical Communication Stations and Airports, timely procurement of spares, working out training requirement of CNS personnel's working under him for training at CATI , carry out associated administrative function and financial activities like preparation of annual budget, exercise of financial powers and any other function assigned to him.

(iii) Duties and Responsibilities:-**Maintenance**

- To ensure availability of Preventive maintenance schedules of CNS and Airport Security equipments installed at the ACS and Airports and CNS circulars issued from time to time to the units;
- To ensure availability of relevant ICAO Annex and documents at all ACS;
- To ensure availability of technical manuals to the ACS for module level maintenance;
- To supervise for strict adherence to preventive maintenance schedules, their related documentation and guidelines of the CNS circulars in respect of CNS/ATM systems and security equipments;
- Carry out annual review of preventive maintenance schedules in consultation with his subordinates and provide his inputs to corporate headquarter and advise remedial action to ACS;
- To keep main and standby channel of a facility always serviceable at the Stations under his control by:-
 - a) Organize timely actions to procure adequate spare parts/modules within his power;
 - b) Project requirements of spare modules/parts sufficiently in advance to head quarter;
- To take adequate advance actions for renewal of maintenance contracts under his delegation of powers, if required.
- Carry out annual evaluation of the performance of CNS facilities and;
 - (i) Advise station for corrective action
 - (ii) Recommend to HQ actions to improve their performance or replace them if service life exceeds its specified life time;
- To organize preparation of survey reports of decommissioned and to be discarded CNS and Airports security equipment within a time frame of one month from the date of decommissioning;
- To monitor the performance of HF communication channels, and AFTN channels and take action for upgrading or additional channels if congestion is above DCA/ICAO limits;

- To organize with all concerned for annual physical verification of CNS assets.
- To monitor that MIS and other reports are regularly received from the stations and take action based on these reports.
- To generate and forward MIS and other reports/returns to HQ on regular basis.
- Yearly review of Station CNS manuals under his control.
- Ensure adherence to safety management requirements of the CNS/ATM systems and Airport security equipments at ACS and airports within his control.
- Ensuring corrective is taken on the aviation safety reports of field stations received from DGCA/Aviation Safety Directorate in respect of CNS/ATM facilities and Airport Security equipments and to bring into notice of HQ, requiring action at HQ level.

Training

- To deploy trained or proficient manpower for the maintenance works by:-
 - a) Organize actions to work out requirement of annual training of station maintenance personnel after transfers preferably in the month of August and forward the requirement to CATI and HQ;
 - b) To nominate CNS personnel for training in CATI as per approved training calendar;

Administrative function

- Conducts interactive meeting with staff once every month and take follow up action to implement actionable points of the minutes of meeting;
- To inspect ACS under his control as and when required and to advise/take remedial action on the shortcomings noticed during inspection;
- To recommend transfer of CNS personnel within region as per operational requirement and transfer policy of DCA;
- Takes actions to promote harmonious relation among the employee;
- Takes administrative action to maintain discipline.

Financial Activities

- Exercises financial power as per DOP to accord administrative and expenditure sanctions to support maintenance of CNS facilities;
- Takes actions for preparation of proposals which are beyond his powers and forward to superior authorities for obtaining expeditious approval;
- Takes timely action to prepare annual budget of CNS and forward to concerned department;
- Follow vigilance guidelines and promote culture of honesty and transparency in discharging official functions.

(iv) Additional works

Carry out additional works assigned to him by superior authorities.

(v) Accountability

He is accountable to DD (CNS).

(vi) Knowledge, experience, skills and abilities

- Posses proficiency or trained at concept level on communication Systems;
- Should have working experience of at least two years on Communication Systems;
- Have knowledge of all maintenance schedules and CNS circulars related to Communication Systems;
- Possess sound knowledge of Annex 10 Vol. II, III, IV, V and relevant ICAO Docs. and related Civil Aviation Requirement (CAR) of DGCA;
- Have the working knowledge of DCA disciplinary and appeal rules;
- Should be able to dictate letters in English;
- Have ability to carry out correspondence in English through E-mail;
- Have good knowledge of working with computer and able to use window operating system and utilities like MS office and internet for obtaining information of interest;
- Have the ability to clearly express his views in English;
- Able to make presentation, preferably through power point of related topics to higher authorities and to gatherings;
- Maintain good working relationship with higher authorities;
- Should have understanding and knowledge about basic ATC operations;
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them .

7. Assistance Engineer (Navigation Systems)

(i) Title: Asst: Engineer (Navigation Systems)

(ii) Job Summary

Supervision of preventive and break down maintenance of Navigation Systems, Coordinate for projection of requirement of spares of Navigation Systems for their timely procurement and carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-

Maintenance

- Supervise to ensure strict adherence to preventive maintenance schedules, their related documentation and guidelines of the CNS circulars.
- Coordinating with other agencies like MCC (Myanmar Construction Cooperation) for maintaining critical and sensitive area of Nav-aid Equipment.
- Carry out annual review of preventive maintenance schedules in consultation with his subordinates and provide inputs to Executive Engineer (Navigation) in charge of the facility.
- To take regular debriefing reports for facilities and take remedial action accordingly.
- Carry out flight inspection of the facility and to take coordination action so that flight inspection is carried out within the stipulated time.
- To go through the shift log books of maintenance staff on regular basis and take remedial measures for the problems maintenance difficulties encountered by shift staff and bring the same in the notice of Executive Engineer (Navigation).
- To visit field units regularly at least once daily.
- To keep main and standby channel of a facility always serviceable and
 - (i) Provide effective guidance to his subordinates.
 - (ii) Take actions for immediate change of unserviceable modules with serviced modules and repair unserviceable modules.
- To bring into notice of Executive Engineer (Maintenance) for renewal of maintenance contracts of NAVIGATION Systems, if required.
- Helping Executive Engineer (Navigation) in carrying out annual evaluation of the performance of NAVIGATION Systems.
- Initiate action of preparation of survey reports of decommissioned and to be discarded NAVIGATION Systems within a time frame of two months from the date of decommissioning.
- Ensure availability of work instructions and suitable test equipment's for carrying out monitoring and maintenance activities.
- Ensure there is a effective control on the monitoring and measurement and all the related system documents.
- Ensuring there is an effective control on non conforming products like old software version, u/s hardware and obsolete documents and prevent its unintended use.

- Ensure there is a continual improvements in handling failures by doing fault analysis, improving maintenance philosophy , and taking timely corrective and maintenance actions.
- Improving the effectiveness and efficiency by reducing system failures or waste in material and time.
- Ensure well documented procedure exists for logging all maintenance activities

Administrative Functions

- Conducts interactive meeting with NAVIGATION Systems maintenance personnel at least once every week and take follow up action with Executive Engineer (Navigation) to implement actionable points of the minutes of meeting.
- Takes actions to promote harmonious relation among the NAVIGATION Systems Unit personnel.
- If required to bring into notice of Executive Engineer (Navigation) for initiating administrative action to maintain discipline.

Financial activities

- Helping Executive Engineer (Navigation) in projecting budget requirements of NAVIGATION unit for incorporation in annual budget of CNS.
- Follow vigilance guidelines and promote culture of honesty and transparency in discharging official functions.

Additional works

Carry out additional works assigned by superior authorities.

(iv) Accountability

He is accountable to Executive Engineer (Navigation) in charge of the concerned unit.

(v) Knowledge, experience, skills and abilities

- Posses proficiency and trained at concept level and equipment level on NAVIGATION unit
- Should have working experience of at least two years in NAVIGATION unit.
- Have knowledge of all maintenance schedules and CNS circulars related to NAVIGATION unit
- Possess sound knowledge of Annex 10 Vol. 1, Vol. V, DOC 8071 Vol. I and related Myanmar Civil Aviation Requirements.
- Ability to independently carry adjustment of NAVIGATION unit.
- Have working knowledge of DCA financial management system.
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them.
- Should have familiarity of working with ATC functionalities, ATC terminologies and basic understanding of Air Traffic control.

8. Asst. Engineer (Surveillance Systems)**(i) Title: Asst. Engineer (Surveillance Systems)****(ii) Job Summary:**

Supervise proper functioning of all facilities/ equipment, test equipment etc. in the Unit. Ensure and carry out preventive maintenance schedule. Ensure corrective maintenance / repair action for faulty equipment. Ensure NOTAM action when facility is off the air. Check and ensure proper maintaining of logbooks. Ensure upkeep of the inventory. Carry out associated administrative function and any other function assigned to him.

(iii) Duties and Responsibilities:-**Maintenance**

- Ensure proper maintenance and serviceability of main and standby channels of Surveillance facilities
- Supervise all preventive maintenance and maintain records of maintenance of the surveillance facilities as per prescribed maintenance schedule
- Ensure pre-monsoon maintenance
- Ensure special maintenance on Antenna, Rotating Assembly, Motor Drive Assembly by greasing, lubricating and changing oil as prescribed manufacturer's manuals.
- To initiate all corrective/ breakdown maintenance and keep Executive Engineer (Maintenance) informed of the un-serviceability.
- If required to coordinate with outside agencies in consultation with Executive Engineer (Surveillance) to carryout special repair works and to develop indigenous substitute of imported items.
- Take NOTAM action incase when facility goes off the air in consultation with Executive Engineer (Surveillance) and DD (CNS).
- To discuss and analyze the cause of breakdown with other officers and staff of the unit, to avoid similar problem from reoccur in the future.
- Check the unit logbook on routine basis and initiates appropriate corrective action.
- To brief the concerned Executive Engineer (Surveillance) regarding the status of the unit on daily basis.
- To coordinate with Civil/Electrical Department and other concerned for smooth functioning of the unit.
- To make arrangements for calibration of all critical Test equipment pertaining to the Surveillance Unit.
- To make arrangements for inspections/ audit of internal or external parties as and when instructed by concerned Executive Engineer (Surveillance).
- To supervise maintenance of all records and spares related to the Unit.
- To project requirements of routine / regular/ special items well in advance for carrying out maintenance and replacement incase of expiry of its life, like battery, oil etc.

- To timely dispatch all routine operational and administrative reports and also as and when required.
- To coordinate with all concerned for annual physical verification of assets as decided by DD (CNS).
- To project requirements for spares and test equipment in consultation with the Executive Engineer (Surveillance).
- To ensure serviceability of remote links between site and ATS building.
- Ensure upkeep of the inventory
- Ensure availability of work instructions and suitable test equipment's for carrying out monitoring and maintenance activities.
- Ensure there is a effective control on the monitoring and measurement and all the related system documents.
- Ensuring there is an effective control on non conforming products like old software version, u/s hardware and obsolete documents and prevent its unintended use.
- Ensure there is a continual improvements in handling failures by doing fault analysis, improving maintenance philosophy , and taking timely corrective and maintenance actions.
- Improving the effectiveness and efficiency by reducing system failures or waste in material and time.
- Ensure well documented procedure exists for logging all maintenance activities

Training

- To access the training needs for staff and officers working directly under him and recommend training to Executive Engineer (Surveillance).

Administrative function

- To prepare the duty roster for the unit in consultation with Executive Engineer (Surveillance)
- To recommend leaves of all Staff of the unit for approval by the concerned Executive Engineer (Surveillance).
- To maintain and preserve attendance/leave registers and all files/records pertaining to the Surveillance Unit.
- To coordinate, if assigned with additional responsibility, with all concerned for project related work pertaining to Surveillance and brief the same to concerned Executive Engineer (Surveillance).
- Ensure attendance for staff and officers
- Ensure wearing of uniform by staff and officers
- Takes actions to promote harmonious relation among the employee.
- To groom/ guide Staff under him to take independent responsibilities in future on promotion
- Additional responsibilities, if assigned.

Financial Activities

- Assist Executive Engineer (Surveillance), DD (CNS) in preparation of annual budget of Surveillance Unit/ CNS wing;
- Maintain Impress account.

(iv) Additional works

- Carry out additional works assigned to him by superior authorities, such as:
 - i. Installation
 - ii. Stock verification

(v) Accountability

He reports to Executive Engineer (Surveillance)

(vi) Knowledge, experience, skills and abilities

- Posses proficiency or trained at concept level and equipment on surveillance equipment
- Have knowledge of all maintenance schedules and CNS circulars related to Surveillance facilities
- Maintain good working relationship with higher authorities and subordinates.
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them.

9. Assistant Engineer (Communication)**(i) Title: Assistant Engineer (Communication)****(ii) Job Summary:-**

Supervision of various units of Communication units in CNS and all Aeronautical communication facilities in all Regions and field stations, working out training requirement of employees working under him, carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:**Maintenance and operation**

- Supervision of various units in Communication Directorate of CNS.
- Monitoring the serviceability performance of Aeronautical Communication facilities/channels/circuits/lines.
- Responsible for deployment of suitable manpower in communication directorate of CNS.
- Responsible for the immediate restoration of services mentioned.
- Responsibility for maintaining record of scheduled returns and scrutiny of such returns from all the stations.
- Responsible to maintain record in respect of letter of agreement frequencies use in DCA, communication (HF/VHF).
- Coordinate with EE (Communication) / DD (CNS) to carryout regular evaluation of performance of communication facilities as per ICAO norms.
- As branch head responsible for preparation of duty schedule for personnel deployed in OPS.
- To monitor progress of implementation of new circuits and facilities.

Training

- To deploy trained and/or proficient manpower in various positions according to ICAO guidelines.
- Propose nomination of personnel according to the norms of CATI to meet operational requirements.

Administrative functions:

- Organizing regular interactive meetings with staff and take action for the implementation of decisions taken for better performance of various services in Communication Operations.
- Streamline the entire system of operation/administration to avoid any procedural lapse.
- Responsible for bringing to the notice of employees, all ICAO notifications/amendments/CNS circulars/Administrative circulars.
- Make available relevant Manuals/Annexes/documents in operational units of all stations for ready reference.
- Responsible for updating of AFS Manual/Manual of Frequency Management System/Telephone Directory.

Financial activities

Project the Modernisation/Up gradation/New installation requirements to EE (Communication) /DD(CNS) for incorporation in annual budget of CNS.

Additional works

Carry out additional works as and when assigned by Superior authorities.

(iv) Accountability

Accountable to EE (Com).

(v) Knowledge, experience, skills and abilities

- Possesses proficiency and/or trained at different levels in one of the services mentioned above.
- Having working experience in all the units.
- Having knowledge of provisions contained in relevant ICAO Annexes and Documents, AFS Manual, FASID table and Myanmar Civil Aviation Requirements (MCAR) published by DCA.
- Having good communication skills in English
- Having ability to coach and impart training to subordinates.

10. Assistant Engineer (AMSS)**(i) Title :- Assistant Engineer (AMSS)**

(ii) Job Summary :- Supervision of preventive and break down maintenance of Automatic Message switching System (AMSS), Long Distance HFRT communication, International Notam Office, Message Room, Briefing and other Com-Ops Units, Leasing of national and international data and voice circuits required for providing ATS and coordination with the telecommunication service providers. Coordinate for projection of requirement of spares of AMSS for their timely procurement, working out training requirement of employees both operational and technical working under him; carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-**Maintenance**

- Make available Preventive maintenance schedules of Automatic Message Switching System and CNS circulars issued from time to time to the units.
- Make available technical manuals to the units for module level maintenance
- Supervise to ensure strict adherence to preventive maintenance schedules, their related documentation and guidelines of the CNS circulars.
- Carry out annual review of preventive maintenance schedules in consultation with his subordinates and provide inputs to EE (Com).
- To keep main and standby channel of a facility always serviceable.
- Provide effective guidance to his subordinates.
- Carry out annual evaluation of the performance HFRT Channels, AFTN Channels and recommend to EE (Com) actions to improve their performance or upgrade them.
- Ensure availability of work instructions and suitable test equipment's for carrying out monitoring and maintenance activities.
- Ensure there is a effective control on the monitoring and measurement and all the related system documents.
- Ensure there is a continual improvements in handling failures by doing fault analysis, improving maintenance philosophy , and taking timely corrective and maintenance actions.
- Improving the effectiveness and efficiency by reducing system failures or waste in material and time.
- Ensure well documented procedure exists for logging all maintenance activities.
- Ensure that HFRT operation is strictly as per ICAO ANNEX 10 Vol II and only standard phraseology is used.
- Ensure availability of work instructions and suitable test equipment's for carrying out monitoring and maintenance activities.
- Ensuring there is an effective control on non conforming products like old software version, u/s hardware and obsolete documents and prevent its unintended use.

Training

- To deploy trained or proficient manpower for the AMSS (Technical and Operational), HFRT operation, International Notam Office and Communication Briefing.
- Organize actions to work out requirement of annual training for Communication (Operational) and Technical personnel of the station after transfers, preferably in the month of August and forward the requirement to EE(Com).
- Nominate personnel of (Com – Operational) and technical personnel for training at CATI.

Administrative Functions

- Conducts interactive meeting with staff at least once every month and take follow up action to implement actionable points of the minutes of meeting.
- Takes actions to promote harmonious relation among the personnel.
- If required, takes administrative action to maintain discipline.

Financial activities

- Project requirements of his unit to EE(Com) for incorporation in annual budget of CNS.
- Follow vigilance guidelines and promote culture of honesty and transparency in discharging official functions.

Additional works

Carry out additional works assigned by superior authorities.

(iv) Accountability

He is accountable to EE (Com).

(v) Knowledge, experience, skills and abilities

- Possesses proficiency or trained at concept level on AMSS /HFRT operation;
- Have knowledge of all maintenance schedules and CNS circulars ;
- Possess sound knowledge of Annex 10 Vol. II,III , V, Annex 15,DOC8126,8400,9734 and related Myanmar Civil Aviation Requirement (MCAR) of DCA.;
- Knowledge about computer systems both software and Hardware.;
- Have working knowledge of DCA financial management system.
- Should be able to dictate letters in English;
- Have ability to carry out correspondence in English through E-mail;
- Have good knowledge of working with computer and able to use window operating system and utilities like MS office and internet for obtaining information of interest;
- Have the ability to clearly express his views in English;
- Able to make presentation, preferably through power point of related topics to higher authorities and to gatherings;
- Maintain good working relationship with higher authorities;
- Have the ability to effectively manage human resource working under him and promote harmonious relation among them.

11. Shift Supervisor (SS), Com operation**(i) Title :- Shift Supervisor (SS), Com operation****(ii) Job Summary :**

All the Radio Operator in com-operation (Shift duty) work under the supervision of SS. SS shall be the authority for management of his shift and he will ensure coverage of positions and channels in accordance with guidelines provided by E.E (Com). Supervision of entire operation of services related to AMSS operation. Coordinate for the maintenance of lines/channels, coordination with service providers and carry out associated administrative functions, project training and man power requirement of the unit concerned and any other works assigned to him/her.

(iii) Duties and Responsibilities:**Maintenance and Operation:**

- Supervision of entire operation of AMSS in his shift.
- Responsible for the smooth operation of Aeronautical Fixed Telecommunication Network.
- To arrange deployment of available manpower in all positions of AMSS.
- Responsible for maintaining record of communication and checking operator's log (Written/Electronic).
- As in-charge of the said unit, responsible for maintaining system static files such as Routing directory and site parameters ,OS, System software.
- Responsible for archival of messages and activities for retention according to MCARS/ICAO norms and retrieval of messages in case of Inquiry/Investigation.
- Coordinate with Executive Engineer (COM) to carryout regular evaluation of performance as suggested by ICAO and take actions to improve performance of the unit.

Training :

- To suggest to Executive Engineer (COM) the requirement of training according to the operational requirements of AMSS.
- Chalk out annual schedule for training of manpower as administrative In-charge of AMSS.

Administrative functions :

- Attending regular interactive meeting organized by the head of the branch, projecting requirements of AMSS relating to Aeronautical Fixed services and take action for the implementation of decisions taken for better performance of Aeronautical Fixed Services.
- Streamline the entire system of operation/administration to avoid any procedural lapse.
- Responsible for bringing to the notice of operators of different AMSS units, all ICAO notifications / amendments /CNS circulars /Administrative circulars.
- Make available relevant Manuals/Annexes/documents in all AMSS units for ready reference.

- Coordinate with maintenance officers to ensure continuity of services of AMSS units.
- Coordinate with Telecommunication Service providers to ensure serviceability of all the leased lines and circuits.

Financial activities :

- Project the Modernization /Up gradation /New installation requirements of AMSS to Executive Engineer (COM) for incorporation in annual budget of CNS.

Additional works :

- Carry out any additional works as and when assigned by Superior authorities.

(iv) Accountability :

- Accountable to Executive Engineer (COM).

(v) Knowledge , Experience , Skills and Abilities :

- Having working experience in AMSS (Operation) and AMSS (System Administration), Computer.
- Having knowledge of provisions contained in ICAO Annex.10 Vol.II, III, DOC 8585, 8400, 9705, AERADIO/AFS Manual, Manual of AFTN Planning and Engineering and Civil Aviation Requirements(CAR) published by DCA.
- Having good communication skills in English
- Having ability to coach and impart training to subordinates
- Having ability to represent DCA of Myanmar in Workshops/ Seminars/ Conventions relating to aviation/non-aviation and able to deliver lecture with audio-visual presentation.

12. Senior Technical Officer/Radio Mechanic (Communication Systems)**(i) Title: - STO / RM (Communication Systems)****(ii) Job Summary:**

Carrying out preventive and break down maintenance of VHF/HF communication Systems and other associated systems, keeping maintenance record, Coordinating with other agencies for smooth functioning of VHF/HF communication Systems and carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-**Maintenance**

- Carrying out preventive maintenance schedules of VHF/HF communication Systems and associated facilities as per approved maintenance schedules, their related documentation as per maintenance schedule and related guidelines;
- Carrying out/helping in breakdown maintenance of VHF/HF communication Systems and associated system either alone or as part of maintenance team as the need may arise;
- To check the quality of voice logger recording as per standard procedure;
- Coordinating with other agencies like Civil and Electrical department for maintaining equipment room and effective air-conditioning and to bring into notice of Asst: Engineer pending issues in this regard;
- Helping Unit in charge in carrying out annual review of preventive maintenance schedules of the facilities;
- To take regular debriefing reports for facilities and take remedial action and bring into notice of his superiors accordingly any unresolved issue;
- Maintain Site /Shift log books and to bring out into notice of Asst. Engineer Com and other issues which can not be resolved by him.
- To check the performance of back up systems at least once daily/shift and keep a record of same;
- To bring into notice of Asst. Engineer maintenance contracts issues of VHF/HF communication Systems, if required;
- Helping Asst. Engineer in carrying out annual evaluation of the performance of VHF/HF communication Systems;
- Helping in initiating action of preparation of survey reports of decommissioned and to be discarded VHF/HF communication Systems within a time frame of one month from the date of decommissioning.
- Ensure effective implementation of Maintenance contract wherever applicable and to the extent possible.
- Preparation of fault report of unserviceable modules and repairing of the faulty modules.
- Maintaining inventory of unit.
- When doing shift duty to check operational and environmental parameters of the facilities;

Additional works

- Carry out additional works assigned by superior authorities.

(iv) Accountability

- He is accountable to Unit in charge of the concerned unit or Shift Supervisory officer as the case may be.

(v) Knowledge, experience, skills and abilities

- Posses proficiency and trained at concept level and equipment level on VHF/HF communication Systems ;
- Have knowledge of all maintenance schedules and CNS circulars related to VHF/HF and other associated systems;
- Possess knowledge of Annex 10 Vol. III, V and related DGCA Civil aviation requirements;
- Ability to carrying out Maintenance/adjustment of VHF/HF communication Systems independently or as a part of maintenance team;
- Posses' knowledge about use of general and special purpose test equipments essential for maintenance of VHF/HF communication Systems and associated systems;
- Have knowledge about initiation for Notam action in respect of VHF/HF communication Systems in case of break down or maintenance of the facility;
- Should have familiarity of working with ATC functionalities, ATC terminologies and basic understanding of Air Traffic control;
- Should know about remote control line lay out and electric power distribution of the facilities and in case of breakdown of the mains power supply for the long duration the alternative action to be taken;
- While working in the shift should have effective communication with other shift officers and ATC for debriefing of the facility;
- Should have knowledge about the emergency communication facilities available in the unit;

13. Senior Technical Officer/ Radio Mechanic (Surveillance System)**(i) Title: - STO / RM (Surveillance Systems)****(ii) Job Summary:**

Carrying out preventive and break down maintenance of Surveillance systems and other associated systems, keeping maintenance record, Coordinating with other agencies for smooth functioning of Surveillance systems and carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-**Maintenance**

- Carrying out preventive maintenance schedules of Surveillance systems and associated facilities as per approved maintenance schedules, their related documentation as per maintenance schedule and related guidelines;
- Carrying out/helping in breakdown maintenance of Surveillance systems and associated system either alone or as part of maintenance team as the need may arise;
- To check the quality of voice logger recording as per standard procedure;
- Coordinating with other agencies like Civil and Electrical department for maintaining equipment room and effective air-conditioning and to bring into notice of Asst-Engineer pending issues in this regard;
- Helping Unit in charge in carrying out annual review of preventive maintenance schedules of the facilities;
- To take regular debriefing reports for facilities and take remedial action and bring into notice of his superiors accordingly any unresolved issue;
- Maintain Site /Shift log books and to bring out into notice of Asst. Engineer surveillance and other issues which can not be resolved by him.
- To check the performance of back up systems at least once daily/shift and keep a record of same.
- To bring into notice of Engineer maintenance contracts issues of Surveillance systems, if required;
- Helping Engineer in carrying out annual evaluation of the performance of Surveillance systems;
- Helping in initiating action of preparation of survey reports of decommissioned and to be discarded Surveillance systems within a time frame of one month from the date of decommissioning.
- Ensure effective implementation of Maintenance contract wherever applicable and to the extent possible.
- Preparation of fault report of unserviceable modules and repairing of the faulty modules.
- Maintaining inventory of unit.
- When doing shift duty to check operational and environmental parameters of the facilities.

Additional works

- Carry out additional works assigned by superior authorities.

(iv) Accountability

- He is accountable to Unit in charge of the concerned unit or Shift Supervisory officer as the case may be. .

(v) Knowledge, experience, skills and abilities

- Posses proficiency and trained at concept level and equipment level on Surveillance systems ;
- Have knowledge of all maintenance schedules and CNS circulars related to Surveillance and other associated systems;
- Possess knowledge of Annex 10 Vol. III, IV,V and related DGCA Civil aviation requirements;
- Ability to carrying out Maintenance/adjustment of Surveillance systems independently or as a part of maintenance team;
- Posses' knowledge about use of general and special purpose test equipments essential for maintenance of Surveillance systems and associated systems;
- Have knowledge about initiation for Notam action in respect Surveillance Systems in case of break down or maintenance of the facility;
- Should have familiarity of working with ATC functionalities, ATC terminologies and basic understanding of Air Traffic control;
- Should know about remote control line lay out and electric power distribution of the facilities and in case of breakdown of the mains power supply for the long duration the alternative action to be taken;
- While working in the shift should have effective communication with other shift officers and ATC for debriefing of the facility;
- Should have knowledge about the emergency communication facilities available in the unit;

14. Senior Technical Officer/ Radio Mechanic (NAVIGATION)

(i) Title:-STO / RM (NAVIGATION) :-

(ii) Job Summary:

Carrying out preventive and break down maintenance of NAVIGATION Equipments and other associated systems, keeping maintenance record, coordinating with other agencies for smooth functioning of NAVIGATION Equipments and carry out associated administrative functions and any other works assigned to him.

(iii) Duties and Responsibilities:-

Maintenance

- Carrying out/helping in preventive maintenance schedules of NAVIGATION Equipments NAVIGATION Equipments and associated facilities as per approved maintenance schedules, their related documentation as per maintenance schedule and related guidelines;
- Carrying out/helping in breakdown maintenance of Surveillance systems and associated system either alone or as part of maintenance team as the need may arise;
- Coordinating with other agencies like GFS, Civil and Electrical wing for maintaining critical and sensitive area of DVOR/DME, Equipment room and effective air-conditioning and to bring into notice of EE (Navigation) pending issues in this regard;
- To assist Asst. Engineer during flight check of the facility and to do coordination work in this regard;
- To assist Unit in charge in carrying out annual review of preventive maintenance schedules of the facilities;
- To take regular debriefing reports for facilities and take remedial action and bring into notice of his superiors accordingly any unresolved issue;
- Maintain Site /Shift log books and to bring out into notice of Asst. Engineer unresolved maintenance and other issues. To check the performance of back up systems at least once daily/shift and keep a record of same.
- To bring into notice of Sr. Radio Mechanic maintenance contracts issues of NAVIGATION Equipments.
- Helping Asst. Engineer in carrying out annual evaluation of the performance of NAVIGATION Equipments;
- Helping in initiating action of preparation of survey reports of decommissioned and to be discarded NAVIGATION Equipments within a time frame of one month from the date of decommissioning.
- Ensure effective implementation of Maintenance contract wherever applicable and to the extent possible.
- Preparation of fault report of unserviceable modules and repairing of the faulty modules at the station level.
- Maintaining inventory of unit.
- When doing shift duty to check operational and environmental parameters of the facilities;

Additional works

- Carry out additional works assigned by superior authorities.

(iv) Accountability

- He is accountable to Unit in charge of the concerned unit or Shift Supervisory officer as the case may be.

(v) Knowledge, experience, skills and abilities

- Posses proficiency and trained at concept level and equipment level on NAVIGATION Equipments;
- Have knowledge of all maintenance schedules and CNS circulars related to NAVIGATION Equipments and other associated systems;
- Possess knowledge about ground adjustments required during flight check of the facility;
- Possess knowledge of Annex 10 Vol.I, III, IV DOC 8071 and related DGCA Civil aviation requirements;
- Ability to carrying out Maintenance/adjustment of NAVIGATION Equipments independently or as a part of maintenance team;
- Posses' knowledge about use of general and special purpose test equipments essential for maintenance of NAVIGATION Equipments and associated systems;
- Have knowledge about initiation for Notam action in respect of NAVIGATION Equipments in case of break down or maintenance of the facility;
- Should have familiarity of working with ATC functionalities, ATC terminologies and basic understanding of Air Traffic control;
- Should know about remote control line lay out and electric power distribution of the facilities and in case of breakdown of the mains power supply for the long duration the alternative action to be taken;
- While working in the shift should have effective communication with other shift officers and ATC for debriefing of the facility;
- Should have knowledge about the emergency communication facilities available in the unit;

15. Radio Operator (Com - Operations (SHIFT):

(i) Title : Radio Operator (Com-shift)

(ii) Job Summary :

Carrying out preventive and break down maintenance of Lines/Circuits and other associated systems, keeping maintenance/operational record, coordinating with other agencies for smooth functioning of various units , working in various units of Communication Operation and carry out associated administrative functions and any other works assigned to him/her.

(iii) Duties and Responsibilities:

Maintenance and Operation :

- Operation in various units of AMSS (Booking/Supervisor), HFRT (Domestic Circuit), NOTAM, and Briefing and in AHCR covering shifts.
- Monitor the serviceability of Data lines.
- Assisting SS (Com operation) in the preparation of duty schedule/Training Schedule.
- Keeping record of Communication for Long Term /Short Term retention according to MCAR/ICAO Standards.
- Maintaining Statistics of Channel Serviceability/Traffic statistics/Transit time statistics.
- Covering the entire operations in addition to the normal duties allotted in case of extension of watch hours in field stations.
- Preparation of Monthly Communication Return / Half yearly Communication Return.

Additional works :

- Carry out any additional works as and when assigned by Superior authorities.

(iv) Accountability

- He is accountable to Shift in charge

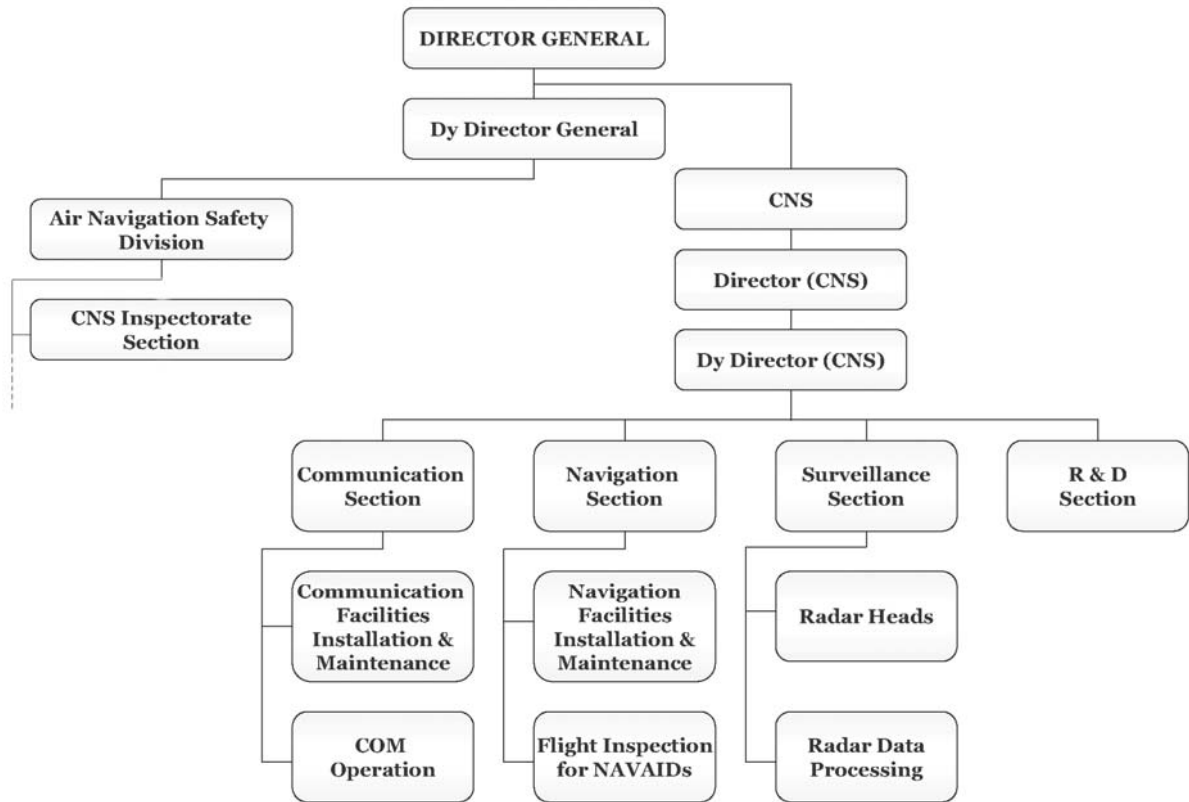
(v) Knowledge, Experience, Skills and Abilities :

- Posses proficiency or trained at different levels in one or more services mentioned above.
- Having working experience in all units.
- Posses knowledge of ICAO Annex.10 Vol II & Vol.V, Doc.8585, 8400, 8126, 7030, 9734, 9705 and Myanmar Civil Aviation Requirement (MCAR).
- Having good communication skills in English.
- Having ability in coaching and impart training to subordinates.
- Able to represent DCA Myanmar in Workshops/Seminars/Conventions relating to aviation/non-aviation fields.

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ATTACHMENT

CNS Organizational Structure



*** End of CNS Manual Vol.I ***