

Controlled Copy

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Manual Number: 1.3.3.

Issue Date: 23 Nov 2017

Revision: Initial

Copyright © 2017 by the Public Authority of Civil Aviation (PACA), Oman

All rights reserved. No part of this publication may be stored in a retrieval system, transmitted, or reproduced in any way, including but not limited to photo-copy, magnetic or other record, without the prior agreement and written permission of the CEO, for PACA, Oman

INTENTIONALLY LEFT BLANK

Table of Contents

Foreword	6
Corrigendum of Amendments.....	6
FOREWORD.....	7
Glossary of Terms	9
1. GENERAL.....	11
1.1. Requirements	11
1.2. Implementation.....	11
1.3. Objectives	11
1.4. Influencing Elements	11
2. AERONAUTICAL TELECOMMUNICATION / RADIO NAVIGATION FACILITIES.	13
2.1. Facilities	13
2.2. Communications.....	13
2.3. Radio Navigation Aids.....	13
2.4. Surveillance	14
2.5. Automated Systems	14
3. MAINTENANCE ACTIVITIES	15
3.1. Maintenance Recording	15
3.2. History of Facilities	15
3.3. Planning	15
3.4. Implementation.....	15
3.5. Preventative Maintenance	16
3.6. Corrective Actions	16
4. MAINTENANCE LEVEL.....	17
4.1. Levels of Maintenance.....	17
4.2. Preventative Maintenance	17
4.3. Minor Corrective Maintenance	17
4.4. Moderate Corrective Maintenance.....	17
4.5. Severe Corrective Maintenance	18
4.6. Maintenance Methodology & Flow Charts	18
5. FAILURE CATEGORY	19
5.1. Categories.....	19
5.2. Category 1.....	19
5.2.1. Rectification	19

5.3. Category 2	19
5.3.1. Provisions	19
5.4. Category 3	19
5.4.1. Rectification.....	19
6. FACILITY LOG BOOK	21
6.1. Recording	21
7. MAINTENANCE EVALUATION.....	23
7.1. Evaluation	23
7.2. Categorization.....	23
8. REPORT.....	25
8.1. Periodic Reports.....	25
8.2. Special Reports.....	25
8.3. Formats of Reports	25
Appendix 1	27
Appendix 2	29
Appendix 2A.....	47
Appendix 3	77
Appendix 4	79
Appendix 5	81
Appendix 6	87
Appendix 6A.....	89
Appendix 6B.....	91
Appendix 6C.....	93

List of Effective Pages

Page No.	Rev No.	Date of Issue	Page No.	Rev No.	Date of Issue	Page No.	Rev No.	Date of Issue
1	Initial	23 Nov 17	49	Initial	23 Nov 17	97		
2	Initial	23 Nov 17	50	Initial	23 Nov 17	98		
3	Initial	23 Nov 17	51	Initial	23 Nov 17	99		
4	Initial	23 Nov 17	52	Initial	23 Nov 17	100		
5	Initial	23 Nov 17	53	Initial	23 Nov 17	101		
6	Initial	23 Nov 17	54	Initial	23 Nov 17	102		
7	Initial	23 Nov 17	55	Initial	23 Nov 17	103		
8	Initial	23 Nov 17	56	Initial	23 Nov 17	104		
9	Initial	23 Nov 17	57	Initial	23 Nov 17	105		
10	Initial	23 Nov 17	58	Initial	23 Nov 17	106		
11	Initial	23 Nov 17	59	Initial	23 Nov 17	107		
12	Initial	23 Nov 17	60	Initial	23 Nov 17	108		
13	Initial	23 Nov 17	61	Initial	23 Nov 17	109		
14	Initial	23 Nov 17	62	Initial	23 Nov 17	110		
15	Initial	23 Nov 17	63	Initial	23 Nov 17	111		
16	Initial	23 Nov 17	64	Initial	23 Nov 17	112		
17	Initial	23 Nov 17	65	Initial	23 Nov 17	113		
18	Initial	23 Nov 17	66	Initial	23 Nov 17	114		
19	Initial	23 Nov 17	67	Initial	23 Nov 17	115		
20	Initial	23 Nov 17	68	Initial	23 Nov 17	116		
21	Initial	23 Nov 17	69	Initial	23 Nov 17	117		
22	Initial	23 Nov 17	70	Initial	23 Nov 17	118		
23	Initial	23 Nov 17	71	Initial	23 Nov 17	119		
24	Initial	23 Nov 17	72	Initial	23 Nov 17	120		
25	Initial	23 Nov 17	73	Initial	23 Nov 17	121		
26	Initial	23 Nov 17	74	Initial	23 Nov 17	122		
27	Initial	23 Nov 17	75	Initial	23 Nov 17	123		
28	Initial	23 Nov 17	76	Initial	23 Nov 17	124		
29	Initial	23 Nov 17	77	Initial	23 Nov 17	125		
30	Initial	23 Nov 17	78	Initial	23 Nov 17	126		
31	Initial	23 Nov 17	79	Initial	23 Nov 17	127		
32	Initial	23 Nov 17	80	Initial	23 Nov 17	128		
33	Initial	23 Nov 17	81	Initial	23 Nov 17	129		
34	Initial	23 Nov 17	82	Initial	23 Nov 17	130		
35	Initial	23 Nov 17	83	Initial	23 Nov 17	131		
36	Initial	23 Nov 17	84	Initial	23 Nov 17	132		
37	Initial	23 Nov 17	85	Initial	23 Nov 17	133		
38	Initial	23 Nov 17	86	Initial	23 Nov 17	134		
39	Initial	23 Nov 17	87	Initial	23 Nov 17	135		
40	Initial	23 Nov 17	88	Initial	23 Nov 17	136		
41	Initial	23 Nov 17	89	Initial	23 Nov 17	137		
42	Initial	23 Nov 17	90	Initial	23 Nov 17	138		
43	Initial	23 Nov 17	91	Initial	23 Nov 17	139		
44	Initial	23 Nov 17	92	Initial	23 Nov 17	140		
45	Initial	23 Nov 17	93	Initial	23 Nov 17	141		
46	Initial	23 Nov 17	94			142		
47	Initial	23 Nov 17	95			143		
48	Initial	23 Nov 17	96			144		

Corrigendum of Amendments

FOREWORD

- A. This Document, Maintenance and Reporting Procedure for Aeronautical Telecommunication Facilities has been issued by the Public Authority for Civil Aviation of Oman (hereinafter referred as PACA) under the provisions of the Civil Aviation Regulation (CAR) 171 Aeronautical Telecommunication/ Radio Navigation Service.
- B. This Document sets out:
1. Guidance in carrying out maintenance of Aeronautical Telecommunication Facilities; and
 2. Guidance in maintenance reporting system to PACA; and
- C. The following standards have been basis for this Document:
1. Civil Aviation Law, The Sultanate of Oman.
 2. ICAO Annex 10 (Standards and Recommended Practices for Aeronautical Telecommunications).
 3. ICAO Doc 8071 (Manual on Testing of Radio Navigation Aids)
 4. CAR 171 (Aeronautical Telecommunication / Radio Navigation - Certification)
- D. The editing practices used in this document are as follows:
1. 'Shall' is used to indicate a mandatory requirement and may appear in CARs.
 2. 'Should' is used to indicate a recommendation.
 3. 'May' is used to indicate discretion by the AUTHORITY the industry or the applicant, as appropriate.
 4. 'Will' indicates a mandatory requirement and is used to advise of action incumbent on the Authority

INTENTIONALLY LEFT BLANK

Glossary of Terms

The following terms or acronyms may be used in any manual or document published by PACA. Reproduction in part or whole is allowed without prior approval. The Document Control Office reserves the rights to include such a listing in any PACA manual or document prior to publishing.

ACC	Area control center of an aeronautical telecommunication/radio navigation facility certificate.
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunication Network
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
ATC	Air Traffic Control
AT/RN	Aeronautical Telecommunication/Radio Navigation
AUTHORITY	<u>Public Authority for Civil Aviation</u>
CAT II	Category II landing procedure
DME	Distance Measuring Equipment
FDPS	Flight Data Processing System
ICAO	International civil aviation organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
NDB	Non-Directional Beacon
PAR	Precession Approach Radar
PSR	Primary Surveillance Radar
RCC	Rescue Coordination Center
RDPS	Radar Data Processing System
RMU	Remote Monitoring Unit
SSR	Secondary Surveillance Radar
UHF	Ultra High Frequency
UPS	Uninterrupted Power Supply
VDL	VHF Digital Link
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	Very High Frequency Omni Directional Radio Range.

INTENTIONALLY LEFT BLANK

1. GENERAL

1.1. Requirements

Each Aeronautical Telecommunication / Radio Navigation (hereinafter referred as AT/RN) Service Provider shall maintain Aeronautical Telecommunication/ Radio Navigation Facilities.

1.2. Implementation

In implementing of maintenance activity, service provider may cooperate with other Aeronautical Telecommunication Facilities Maintenance Organization approved by PACA.

1.3. Objectives

The objectives of maintenance activity in paragraph 1.1 are:

- (a) prevent equipment not functioning according to standard;
- (b) prevent failure of operation;
- (c) prevent major failure to the equipment;
- (d) guarantee availability of equipment (Availability);
- (e) ensure operational reliability of equipment by extending Mean Time Between Failure (MTBF);
- (f) shorten the repair time or Mean Time To Repair (MTTR);
- (g) extend the life of the equipment operation;
- (h) reduce repair costs;
- (i) Increasing direct and indirect support for aviation security and safety.

1.4. Influencing Elements

In order to achieve the maintenance objectives of AT/RN facilities as referred to in paragraph 1.3, it is necessary to provide the following elements:

- (a) human resources in accordance with adequate quality and quantity;
- (b) equipment maintenance fund;
- (c) work tools, measuring tools, testing equipment, spare parts (modules and / or consumables) and technical documents;
- (d) Maintenance guidelines.

INTENTIONALLY LEFT BLANK

2. AERONAUTICAL TELECOMMUNICATION / RADIO NAVIGATION FACILITIES.

2.1. Facilities

Aeronautical Telecommunication/ Radio Navigation Facilities, consist of:

- (a) Communication Facilities;
- (b) Radio Navigation Aids;
- (c) Surveillance Facilities;
- (d) Automation System.

2.2. Communications

Communication Facilities as referred to paragraph 2.1. (a) covers:

- (a) Automatic Message Handling System (AMHS);
- (b) High Frequency - Single Side Band (HF-SSB);
- (c) AFTN;
- (d) Direct Speech (DS);
- (e) Transmission System (Radio Link, VSAT, Fiber Optic);
- (f) Voice Switching Communication System (VSCS);
- (g) VHF Data Link;
- (h) Integrated Remote Control and Monitoring System (IRCMS);
- (i) Very High Frequency Air Ground Communication (VHF-A/G);
- (j) Automatic Terminal Information Service (ATIS);
- (k) High Frequency Air Ground Communication (HF-A/G);
- (l) Voice Recorder.

2.3. Radio Navigation Aids

Radio Navigation Aid Facilities as referred to paragraph 2.1. (b) covers:

- (a) Non Directional Beacon (NDB);
- (b) Very High Frequency Omni Directional Range (VOR);
- (c) Distance Measuring Equipment (DME);
- (d) Precision Approach Radar (PAR);
- (e) Global Navigation Satellite System (GNSS) and the augmentation system.

2.4. Surveillance

Surveillance Facilities as referred to paragraph 2.1. (c) covers:

- (a) Primary Surveillance Radar (PSR);
- (b) Secondary / Mono-pulse Surveillance Radar (SSR/MSSR);

2.5. Automation Systems

Automation System as referred to paragraph 2.1. (d) covers:

- (a) Automatic Dependent Surveillance (ADS),
- (b) Controller Pilot Data Link Communication (CPDLC) Processing;
- (c) Radar Data Processing System (RDPS);
- (d) Flight Data Processing System (FDPS);
- (e) Aeronautical Information System (AIS).

3. MAINTENANCE ACTIVITIES

3.1. Maintenance Recording

The maintenance activities of AT/RN not limited to:

- (a) establishment of history of AR/RN Facilities;
- (b) maintenance planning of AT/RN facilities;
- (c) implementation of maintenance of AT/RN facilities;

3.2. History of Facilities

The history of AT/RN facilities as referred to paragraph 3.1. (a) shall include:

- (a) date / month / year of equipment procurement / installation;
- (b) repair / replacement of units / parts / equipment modules;
- (c) recondition / overhaul equipment;
- (d) Repair / replacement of software.

The historical format of AT/RN Facilities as referred to in paragraph 3.2 (a) to (d) shall be contained in Attachment 1 to this Document.

3.3. Planning

Planning for maintenance of AT/RN facilities as referred to paragraph 3.1 (b) shall include the following elements:

- (a) the planning of the technician's provision includes:
 - (1) quality and quantity of technicians;
 - (2) Training program.
- (b) budget planning to finance equipment maintenance;
- (c) planning of providing work tools, measuring tools, testing tools and calibration laboratory of measuring tools for improvement;
- (d) Planning of spare parts procurement.

3.4. Implementation

Implementation of maintenance of AT/RN facilities as referred to paragraph 3.1. (c) shall cover the following activities:

- (a) preventive maintenance;
- (b) corrective maintenance;
- (c) Maintenance evaluation.

3.5. Preventative Maintenance

Preventive maintenance as referred to paragraph 3.5. (a) aims to maintain performance of equipment, which activities include:

- (a) daily maintenance;
- (b) weekly maintenance;
- (c) monthly maintenance;
- (d) quarterly maintenance;
- (e) semi-annual maintenance;
- (f) annual maintenance

A list of preventative maintenance activities and the implementation of prevention maintenance activities as referred to in paragraph 3.6 (a) to (f) shall be contained in Appendix 2 and 2A of this Document.

3.6. Corrective Actions

Corrective Maintenance as referred to paragraph 3.5. (b) aims to return equipment that is experiencing in disruption / failure back to normal conditions, which the activities include:

- (a) analysis of equipment failure;
- (b) re-adjustment of equipment;
- (c) replacement of components / modules / parts / units of equipment;
- (d) repair of modules / parts / unit's / equipment software;
- (e) equipment modification;
- (f) recondition or overhaul equipment.

4. MAINTENANCE LEVEL

4.1. Levels of Maintenance

Based on the level of difficulties, maintenance of the AT/RN facilities is divided into:

- (a) Maintenance level 1 (Preventative);
- (b) Maintenance level 2 (Minor Corrective Maintenance);
- (c) Maintenance level 3 (Moderate Corrective Maintenance);
- (d) Maintenance level 4 (Severe Corrective Maintenance).

4.2. Preventative Maintenance

Maintenance level 1 as referred to paragraph 4.1. (a) is a preventive maintenance that is carried out periodically with the following activities:

- (a) cleaning of the room;
- (b) cleaning equipment, units / parts of equipment or modules;
- (c) inspection of equipment, unit / equipment parts or equipment modules;
- (d) meter measurement and indicator light tests;
- (e) measurement and recording of equipment's parameter;
- (f) replacement of indicator lights, safety components and other consumables

4.3. Minor Corrective Maintenance

Maintenance level 2 as referred to paragraph 4.1. (b) consists of:

- (a) preventive maintenance that is carried out periodically, with the following activities:
 - (1) trials on equipment, unit / piece of equipment;
 - (2) view and target observation;
 - (3) Checking the output of equipment, unit / parts of equipment.
- (b) corrective maintenance for minor abnormalities / failure / failure, the activities as follows:
 - (1) failure analysis;
 - (2) adjustment of equipment parameters;
 - (3) replacement and adjustment of defective equipment units / parts / modules.

4.4. Moderate Corrective Maintenance

Maintenance level 3 as referred to paragraph 4.1. (c) is corrective maintenance if the equipment is interrupted / failure moderately, with the following activities:

- (a) failure analysis;
- (b) repair and re-adjustment of defective unit / part / module of.

4.5. Severe Corrective Maintenance

Maintenance of level 4 as referred to paragraph 4.1. (d) is corrective maintenance if the equipment is subject to severe failure, with the following activities:

- (a) failure analysis;
- (b) repair of software system of the equipment;
- (c) repair and re-adjustment of unit / part / module of equipment with complex failure by using external measuring instruments;
- (d) modification and re-adjustment of equipment units / parts / modules;
- (e) recondition or overhaul equipment

4.6. Maintenance Methodology & Flow Charts

Maintenance of equipment in accordance with the levels of difficulty referred to paragraph 4.1, shall be carried out in accordance with the flowcharts as contained in Appendix 3 of this document.

5. FAILURE CATEGORY

5.1. Categories

Failure to equipment is categorized as follows:

- (a) category 1 (one);
- (b) category 2 (two);
- (c) category 3 (three)

5.2. Category 1

Failure category 1 (one) equipment as referred to paragraph 5.1. (a), shall constitute a breakdown causing the discontinuation / cessation of equipment operation (main and standby).

5.2.1. Rectification

Rectification works of failure category 1 (one) shall be done not later than 8 (eight) hours since the occurrence of failure.

5.3. Category 2

Failure category 2 as referred to paragraph 5.1. (b), shall constitute a failure which causes the decrease of equipment's performance but not cause the discontinuation / cessation of equipment's operation. Upgrades to Cat 1 if not returned by due time.

5.3.1. Provisions

Failure category 2 (two) as referred to in paragraph 5.3, occurs when the equipment has decreased in coverage or the emitted frequency is unstable.

5.4. Category 3

Failure category 3 as referred to paragraph 5.1. (c), shall constitute equipment failure occurring on the supporting equipment but shall not affect the performance of equipment and If not corrected may turn into failure Category 1 or Category 2 (with specific date/time for restoration).

5.4.1. Rectification

Rectification works of failure category 3 (three) shall be made not later than 24-72 hours after failure occurs.

INTENTIONALLY LEFT BLANK

6. FACILITY LOG BOOK

6.1. Recording

Each maintenance activities as referred to paragraph 3.5. (a) and (b) shall be recorded in the facility log book.

This facility logbook is shown in Appendix 4 of this Document.

INTENTIONALLY LEFT BLANK

7. MAINTENANCE EVALUATION

7.1. Evaluation

Evaluation of maintenance as meant in paragraph 3.4. (c), is conducted every 1 year for the determination of repair planning, provision of spare parts and equipment replacement.

The procedure of evaluation as intended in paragraph 7.1 is shown in Appendix 5 of this Document.

7.2. Categorization

The evaluation results of AT/RN facilities as meant in paragraph 7.1 shall be categorized into 3 groups as follows:

- (a) a group of equipment that is very often disrupted / failure with availability <70%;
- (b) a group of equipment that often experience disrupted / failure with availability 70% <A <95%;
- (c) any group of equipment with very rare disruption / failure with 95% availability.

INTENTIONALLY LEFT BLANK

8. REPORT

8.1. Periodic Reports

Each maintenance activity of AT/RN shall be reported to the Air Navigation Safety Department periodically.

The above periodic report will consist of:

- (a) Monthly report, containing the following:
 - (1) the performance of AT/RN facilities;
 - (2) list of equipment and conditions.
- (b) Annual report, containing the activities of the corrective maintenance of AT/RN equipment.

8.2. Special Reports

Special Reports shall contain failure and corrective maintenance reports on AT/RN facilities that suffered Category - 1 and Category - 2 failures that required the issuance of NOTAMs.

8.3. Formats of Reports

The format of periodic reports and special reports are contained in Appendix 6 - 6A, 6B, 6C and 6D of this Document.

INTENTIONALLY LEFT BLANK

Appendix 1

HISTORY LOG SHEET
AERONAUTICAL TELECOMMUNICATION/RADIO NAVIGATION FACILITIES

AIRPORT NAME :
FACILITY :
EQUIPMENT NAME :
BRAND / TIPE :
SERIAL NUMBER :

NO.	DATE	DESCRIPTION	REMARK
1	2	3	4

C.N.S Director

.....

INTENTIONALLY LEFT BLANK

Appendix 2

LIST OF PREVENTIVE MAINTENANCE ACTIVITY AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : COMMUNICATION

EQUIPMENT : AUTOMATIC MESSAGE HANDLING SYSTEM
(AMHS)

MAINTENANCE ACTIVITIES						REMARK
DAILY 1	WEEKLY 2	MONTHLY 3	QUARTERLY 4	SEMESTER 5	YEARLY 6	
1. General -	1. General a. Check main supply output b. Clean the entire room of the equipment	1. General a. Check the output power supply voltage of UPS / Stabilizer	1. General a. Inspect all connectors	1. General -	1. General a. Clean the dust on the UPS and Stabilizer b. Replace battery of UPS if necessary	
2. Supervisory a. Check the brightness b. Check the paper supplies in the printer c. Check the printer ribbon	2. Supervisory a. Check the printer display introductory function	2. Supervisory a. Check the keyboard function	2. Supervisory a. Check interconnection system	2. Supervisory a. Check the software function	2. Supervisory a. Check the cooling fan function of the rack	
3. Reject Edit a. Check the brightness b. Check the paper supplies in the printer c. Check the printer ribbon	3. Reject Edit a. Check printer output	3. Reject Edit a. Check the keyboard function	3. Reject Edit a. Check interconnection system	3. Reject Edit a. Check the software function	3. Reject Edit a. clean filter cooling system CPU	

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

LIST OF PREVENTIVE MAINTENANCE ACTIVITY
AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : COMMUNICATION

PERALATAN : DIRECT SPEECH (DS)

MAINTENANCE ACTIVITIES						REMARK
DAILY 1	WEEKLY 2	MONTHLY 3	QUARTERLY 4	SEMESTER 5	YEARLY 6	
-	a. Check the cleanliness of iPOS and indicators	a. Check physical equipment condition	a. Check the connection with the related section/unit	-	-	

Note: *If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.*

LIST OF PREVENTIVE MAINTENANCE ACTIVITY
AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : COMMUNICATION

EQUIPMENT : VOICE SWITCHING COMMUNICATION SYSTEM
(VSCS)

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
1. General -	1. General a. Clean the entire equipment from dust / dirt b. Check the room temperature	1. General -	1. General a. Export the Monitor And Control Station configuration for backup	1. General -	1. General a. Replace the Fan Filter of the cabinet or rack	
2. System Management a. Check the monitor brightness	2. System Management a. Check the event Log b. Check the cleanness of the rack	2. System Management a. Check the power supply voltage of PLN / Genset b. Check the output power supply voltage of UPS / Stabilizer	2. System Management a. -	2. System Management a. -	2. System Management a. -	
3. Position Control a. Check the monitor brightness b. Check the Monitor and Control Station - Status Display c. Check the status of RAID (if Applicable) d. Check the status of Duplicated MCS -Server (if Applicable)	3. Position Control a. Cek Monitor/function Indicator b. Check the Touch Screen Panel c. Clean the touch Panel	3. Position Control a. Clean the MCS screen	3. Position Control a. -	3. Position Control a. -	3. Position Control a. -	

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

Initial

FACILITY : COMMUNICATION

EQUIPMENT : VERY HIGH FREQUENCY AIR GROUND COMMUNICATION (VHF-A/G)

MAINTENANCE ACTIVITIES						
DAILY 1	WEEKLY 2	MONTHLY 3	QUARTERLY 4	SEMESTER 5	YEARLY 6	REMARK 7
1. General a. Check the TX room temperature b. Check the power supply voltage out of the Stabilizer and UPS	1. General a. Clean the entire Shelter of the equipment	1. General a. Check the power supply voltage out of the Stabilizer and UPS b. Check Obstacle around the shelter c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration	1. General a. Clean all equipment thoroughly	1. General	1. General a. Check lightning protection and grounding system. b. Check condition of supply cable and control cable	
2. Transmitter a. Check all indicators b. Check LCD / Main Screen Display.	2. Transmitter a. Check meter reading based on BITE b. Check Change over switch function	2. Transmitter a. Perform performance check as per approved form b. Check operational equipment using backup power supply	2. Transmitter a. Perform Transmitter Power calibration b. Check VSWR c. Measure DC level terminal with ON equipment condition	2. Transmitter a. Check the coverage range by plane	2. Transmitter a. Check all the external connector s are securely fitted b. Perform frequency measurement using frequency counter c. Perform a BIT Interruptive Test d. Perform an AC and DC Change over check (if both supplies are connected)	
3. Receiver a. Check all indicators b. Check LCD / Main Screen Display.	3. Receiver a. Check meter reading based on BITE b. Check Change over switch function	3. Receiver a. Perform performance check as per approved form b. Check operational equipment using backup power supply	3. Receiver a. Measure DC level terminal with ON equipment condition	3. Receiver	3. Receiver a. Check all the external connector s are securely fitted	

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
4. Antenna a. -	4. Antenna a. -	b. Adjust Squelch to eliminate noise c. Do recording parameter 4. Antenna	4. Antenna	4. Antenna a. Perform antenna inspection	b. Perform frequency measurement using frequency counter c. Perform a BIT Interruptive d. Perform an AC and DC Change over check (if both supplies are connected) 4. Antenna	

Note: *If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.*

**LIST OF PREVENTIVE MAINTENANCE ACTIVITY
AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES**

FACILITY : COMMUNICATION

**EQUIPMENT : AUTOMATIC TERMINAL INFORMATION
SERVICE (ATIS)**

MAINTENANCE ACTIVITIES						REMARK
DAILY 1	Weekly 2	MONTHLY 3	QUARTERLY 4	SEMESTER 5	YEARLY 6	
1. General a. Check the TX room temperature 2. Console a. Check the monitor's brightness setting b. Check the Indicator of each Unit of Equipment 3. Transmitter a. Check the fan (fan) air conditioner b. Check all indicator lights	1. General a. Clean the entire equipment from dust / dirt b. Check the power supply voltage 2. Console a. Check the connection system between units 3. Transmitter a. Check the transmitter indicators locally and remotely	1. General a. Check the backup power supply system (UPS) 2. Console a. Check the keyboard function b. Check the mouse function 3. Transmitter a. Test switch over unit to play to standby and vice versa	1. General 2. Console a. Check the recording function b. Check the play back function 3. Transmitter a. Measure DC level terminal with equipment condition "ON"	1. General a. Clean the dust on the UPS and Stabilizer 2. Console a. Clean air circulation filter (fan) 3. Transmitter a. Checking the transmitter working frequency	1. General a. Check Battery of UPS, do replacement if necessary 2. Console a. Check system operation thoroughly 3. Transmitter a. Measurement of power output b. VSWR measurement	

Note: *If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.*

LIST OF PREVENTIVE MAINTENANCE ACTIVITY
AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : COMMUNICATION

EQUIPMENT : VOICE RECORDER

KEGIATAN YANG DILAKSANAKAN						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
1. General a. Check the TX room temperature	1. General a. Clean the equipment room b. Clean the equipment, unit / part of equipment or module c. Check main power supply d. Check output UPS/backup supply	1. General a. Check UPS's battery	1. General a. -	1. General a. -	1. General a. -	
2 Management System a. Check recording file b. Check channel status indicator	2 Management System a. Check all events in the event log file	2 Management System a. Do hard disk data back up	2 Management System a. Do hard disk data cloning, if necessary	2 Management System a. Check performance of voice recorder software	2 Management System a. Check the connection from server to hardware b. Check replay function	
3 Work Station a. Check hardware status	3 Work Station a. Check mouse and keyboard function	3 Work Station a. Clean screen display	3 Work Station a. Perform audio quality measurements of recorded items	3 Work Station a. Check the PC function	3 Work Station a. Check interconnection from server to hardware b. Perform replacement of hard disk, if needed	

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

LIST OF PREVENTIVE MAINTENANCE ACTIVITY AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : RADIO NAVIGATION AIDS

EQUIPMENT : VERY HIGH FREQUENCY OMNI DIRECTIONAL
RANGE (VOR)

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
1 General a. Check the TX room temperature b. Check the power supply voltage out of the Stabilizer and UPS	1 General a. Check the input power supply voltage of Main Supply or Genset	1 General a. Clean the entire Shelter of the equipment b. Check Obstacle around the shelter c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration	1 General a. Clean all equipment thoroughly	1 General	1 General a. Check lightning protection and grounding system. b. Check condition of supply cable and control cable	
2 Transmitter a. Check all indicators b. Check all Monitor Indicators c. Check Tone Identification	2 Transmitter a. Record meter reading on VOR system b. Perform Change Over Unit	2 Transmitter a. Perform Ground Check/inspection as per approved Ground Check Form b. Check operational equipment using backup power supply	2 Transmitter a. Check Auto Transfer b. Reassign Main /Standby Transmitter	2 Transmitter a. Check Carrier output power b. Check Station Ident c. Check Antenna VSWR d. Check carrier frequency e. Check operating frequency f. Verify BITE Wattmeter Calibration g. Verify BITE Frequency Counter Calibration h. Verify BITE VSWR Calibration	2 Transmitter a. Check Audio Frequency	

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
3 RCSU a. Check RCSU/RSU panel indicator b. Check RCSU/RSU alarm indicator	3 RCSU	3 RCSU a. Clean RCSU/RSU front panel	3 RCSU a. Visual Inspection b. RCSU Operational Check c. Station Alarm Check	3 RCSU	3 RCSU a.	
1	2	3	4	5	6	7
4 Antenna	4 Antenna	4 Antenna	4 Antenna a. Perform Inspection of field monitor Antenna b. Clean the field monitor antenna from debris	4 Antenna	4 Antenna a. Perform Inspection of antenna system (carrier and sideband)	

Note: *If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.*

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

LIST OF PREVENTIVE MAINTENANCE ACTIVITY AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : RADIO NAVIGATION AIDS

EQUIPMENT : DISTANCE MEASURING EQUIPMENT (DME)

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
1 General a. Check the TX room temperature b. Check the power supply voltage out of the Stabilizer and UPS	1 General a. Check the input power supply voltage of Main Supply or Genset	1 General a. Clean the entire Shelter of the equipment b. Check Obstacle around the shelter c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration	1 General a. Clean all equipment thoroughly b.	1 General	1 General a. Check lightning protection and grounding system. b. Check condition of supply cable and control cable	
2 Transmitter a. Check all indicators b. Check all Monitor Indicators c. Check Tone Identification	2 Transmitter a. Check meter reading on DME system b. Perform Change Over Unit	2 Transmitter a. Perform Ground Check/inspection as per approved Ground Inspection Form b. Check operational equipment using backup power supply	2 Transmitter a. Perform Remote DME Certification Check b. Reassign Mian /Standby Transmitter	2 Transmitter a. Perform Transmitter Frequency Performance Check b. Receiver frequency performance check c. Interrogator frequency performance check d. Transmitter pulse performance check e. Transmitter power output performance check f. Receiver and Decoder performance check	2 Transmitter a. Perform Local full Diagnostics	

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
<p>3 RCSU</p> <p>a. Check RCSU/RSU panel indicator</p> <p>b. Check RCSU/RSU alarm indicator</p> <p>4 Antenna</p>	<p>3 RCSU</p> <p>4 Antenna</p>	<p>3 RCSU</p> <p>a. Clean RCSU/RSU front panel</p> <p>4 Antenna</p>	<p>3 RCSU</p> <p>a. Visual Inspection</p> <p>b. RCSU Operational Check</p> <p>c. Station Alarm Check</p> <p>4 Antenna</p>	<p>g. Transponder reply delay performance check</p> <p>h. Identification frequency performance check</p> <p>i. Monitor Interrogation performance check</p> <p>j. Monitor shutdown/transfer control performance check</p> <p>k. Monitor alarm integrity performance check</p> <p>3 RCSU</p> <p>4 Antenna</p> <p>a. Perform Inspection of Antenna</p> <p>b. Clean the antenna from debris</p>	<p>3 RCSU</p> <p>a. -</p> <p>4 Antenna</p>	

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

LIST OF PREVENTIVE MAINTENANCE ACTIVITY AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : SURVEILLANCE

EQUIPMENT : PRIMARY SURVEILLANCE RADAR (PSR)
SECONDARY SURVEILLANCE RADAR/
MONOPULSE SECONDARY SURVEILLANCE RADAR
(SSR/MSSR)

MAINTENANCE ACTIVITIES						REMARK
DAILY 1	WEEKLY 2	MONTHLY 3	QUARTERLY 4	SEMESTER 5	YEARLY 6	
1 General a. Check the TX room temperature	1 General a. Clean the entire Shelter of the equipment b. Check the input power supply voltage of Main Supply or Genset c. Check the power supply voltage out of the Stabilizer and UPS	1 General a. Check Obstacle around the shelter b. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration	1 General a. Clean all equipment thoroughly b. Check battery function by simulating a power failure	1 General	1 General	
2 Antenna	2 Antenna	2 Antenna a. Check Oil Level and evidence of oil leaks b. Check for abnormal noise or vibration c. Visual inspection of Moving part	2 Antenna	2 Antenna a. Check for Grease rotation antenna mechanism	2 Antenna a. Check state of guides visually for oxidation of flanges b. Check VSWR at the guide input c. Check losses in the guide	
3 Transmitter a. Check all indicators	3 Transmitter a. Record meter reading based on BITE	3 Transmitter a. Perform Ground Check / Inspection as per approved ground inspection form	3 Transmitter	3 Transmitter a. Calibrate all meters and indicators	3 Transmitter	

Initial

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

LIST OF PREVENTIVE MAINTENANCE ACTIVITY
AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : AUTOMATION

EQUIPMENT : ATC SYSTEM

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
a. Check ATC System input status (AFTN, AMHS, etc) b. Check Radars input status c. Check server status d. Check CWP's/nodes status e. Check reply status f. Check other related system status (i.e. simulator, traces file, billing file tape recorder, etc)	a. Check operational of Air Situation Display (ASD) reply b. Check working light and maping light of console desk c. Clean ATC system display	a. Clean outpart of console and CPU of ATC System b. Clean outpart of console and CPU of ATC System replay c. Change over server of ATC system d. Restart CWP's/nodes of ATC system	a. Reboot server of ATC system b. Reboot CWP's / Nodes of ATC system c. reboot Server and CWP's of ATC system	a. Update layout of ATC System b. Update network connection of ATC system c. Update layout of ATC replay System d. Update network connection of ATC	a. clean inner part of CPU's server of ATC system b. Clean inner part of CPU and keyboard of CWP's /Nodes c. Clean inner part of CPU and keyboard of replay's server	

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

LIST OF PREVENTIVE MAINTENANCE ACTIVITY
AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : AUTOMATION

EQUIPMENT : ATC SIMULATOR AND CBT

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	7
1 ATC SIMULATOR a. -	1 ATC SIMULATOR a. Check Simulator Status b. Check working light and console light	1 ATC SIMULATOR a. Clean CPU on Simulator server rack b. Clean console and CPU simulators c. Clean simulator displays d. Restart server and CWP - Sim Part	1 ATC SIMULATOR a. Reboot server and CWP of Sim part	1 ATC SIMULATOR a. Update layout of Simulator b. Update network connection of Simulator	1 ATC SIMULATOR a. clean inner part of CPU's server and keyboard of simulator b. Clean inner part of CPU and keyboard of CWP's /Nodes c. Clean inner part of CPU and keyboard of replay's server	
2 CBT a. -	2 CBT a. -	2 CBT a. Clean display server and Client CBT	2 CBT a. -	2 CBT a. Update layout of CBT b. Update network connection of CBT	2 CBT a. Clean inner part of CPU's server and keyboard of CBT	

Note: If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

LIST OF PREVENTIVE MAINTENANCE ACTIVITY AERONAUTICAL TELECOMMUNICATION /RADIO NAVIGATION FACILITIES

FACILITY : RADIO NAVIGATION AIDS

EQUIPMENT : INSTRUMENT LANDING SYSTEM

MAINTENANCE ACTIVITIES						REMARK
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	
1	2	3	4	5	6	
1 General a. Check the TX room temperature b. Check the power supply voltage out of the Stabilizer and UPS	1 General a. -	1 General a. Clean the entire Shelter of the equipment b. Check Obstacle around the shelter c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration	1 General a. Clean all equipment thoroughly b.	1 General a. -	1 General a. Check lightning protection and grounding system. b. Check condition of supply cable and control cable	Perform Phase Modulation every 3 years
2 Localizer a. Check all indicators b. Check Monitor Indicators c. Check alarm indicator d. Check Tone Identification	2 Localizer a. Check meter reading on Localizer system b. Perform Change Over Unit	2 Localizer a. Perform Ground Check/inspection as per approved Ground Inspection Form b. Check operational equipment using backup power supply	2 Localizer a. Check Spurious Modulation b. Check Coverage c. Check Auto Transfer d. Reassign Main /Standby Transmitter	2 Localizer a. Check unwanted Modulation	2 Localizer a. Check polarization b. Check frequency synthesizer for carrier /and clearance frequency. c. Check transmitter signals with respect to further parameters like harmonics or spurious d. Take a complete memory readout of all possible parameters	
3 Glide Path a. Check all indicators b. Check Monitor Indicators	3 Glide Path a. Check meter reading on Glide path system b. Perform Change Over Unit	3 Glide Path a. Perform Ground Check/inspection as per approved Ground Inspection Form b. Check operational equipment using backup power supply	3 Glide Path a. Check Spurious Modulation b. Check Coverage	3 Glide Path a. Check unwanted Modulation	3 Glide Path a. Check polarization b. Check frequency synthesizer for carrier /and clearance frequency.	

MAINTENANCE ACTIVITIES						
DAILY	WEEKLY	MONTHLY	QUARTERLY	SEMESTER	YEARLY	REMARK
1	2	3	4	5	6	7
c. Check alarm indicator			c. Check Auto Transfer		c. Check transmitter signals with respect to further parameters like harmonics or spurious	
			d. Reassign Main /Standby Transmitter		d. Take a complete memory readout of all possible	
4 RCSU	4 RCSU	4 RCSU	4 RCSU	4 RCSU	4 RCSU	
a. -	a. -	a. Clean RCSU/RSU front panel	a. Visual Inspection		a. UPS Battery Check	
			b. RCSU Operational Check			
			c. Station Alarm Check			
5 Antenna	5 Antenna	5 Antenna	5 Antenna	5 Antenna	5 Antenna	
a. -	a. -	a. Perform Inspection of Antenna				
		b. Clean the antenna from debris				

Note: *If there are measurement parameters in the equipment manual that are not included in the above measurement table, then it can be inserted into maintenance activity table.*

INTENTIONALLY LEFT BLANK

Appendix 2A

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Radio Navigation Aids
Equipment : VHF Omni Range (VOR)

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Daily Maintenance																																
1 General																																
a. Check the TX room temperature																																
b. Check the power supply voltage out of the Stabilizer and UPS																																
2 Transmitter																																
a. Check all indicators																																
b. Check all Monitor Indicators																																
c. Check Tone Identification																																
3 RCSU																																
a. Check RCSU/RSU panel indicator																																
b. Check RCSU/RSU alarm indicator																																
4 Antenna																																
a. -																																
Weekly Maintenance																																
1 General																																
a. Check the input power supply voltage of Main Supply or Genset																																
2 Transmitter																																
a. Check meter reading on VOR system																																
b. Perform Change Over Unit																																
3 RCSU																																
a. -																																
4 Antenna																																
a. -																																
Monthly Maintenance																																
1 General																																
a. Clean the entire Shelter of the equipment																																
b. Check Obstacle around the shelter																																
c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

ACTIVITIES	DATE																																	REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
2 Transmitter																																		
a. Perform Ground Check/inspection as per approved Ground Check Form																																		
b. Check operational equipment using backup power supply																																		
3 RCSU																																		
a. Clean RCSU/RSU front panel																																		
4 Antenna																																		
a. -																																		
Technician /Engineer																																		
Chief/Supervisor																																		

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Radio Navigation Aids
Equipment : VHF Omni Range (VOR)

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. Clean all equipment thoroughly													
2. Transmitter													
a. Check Auto Transfer													
b. Reassign Main /Standby Transmitter													
3. RCSU													
a. Visual Inspection													
b. RCSU Operational Check													
c. Station Alarm Check													
4. Antenna													
a. Do Inspection of field monitor Antenna													
b. Clean the field monitor antenna from debris													
Semester Maintenance													
1. General													
a. -													
2. Transmitter													
a. Check Carrier output power													
b. Check Station Ident													
c. Check Antena VSWR													
d. Check carrier frequency													
e. Check operating frequency													
f. Verify BITE Wattmeter Calibration													
g. Verify BITE Frequency Counter Calibration													
h. Verify BITE VSWR Calibration													
3. RCSU													
a. -													
4. Antenna													
a. -													
Yearly Maintenance													
1. General													
a. Check lightning protection and grounding system.													
b. Check condition of supply cable and control cable													
2. Transmitter													
a. Check Audio Frequency													
3. RCSU													
a. UPS Battery Check													
4. Antenna													
a. Do Inspection of antenna system (Carrier and Sideband)													
Technician /Engineer													
Chief/Supervisor													

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Radio Navigation Aids
Equipment : Distance Measuring Equipment (DME)

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Daily Maintenance																																	
1 General																																	
a. Check the TX room temperature																																	
b. Check the power supply voltage out of the Stabilizer and UPS																																	
2 Transmitter																																	
a. Check all indicators																																	
b. Check all Monitor Indicators																																	
c. Check Tone Identification																																	
3 RCSU																																	
a. Check RCSU/RSU panel indicator																																	
b. Check RCSU/RSU alarm indicator																																	
4 Antenna																																	
a. -																																	
Weekly Maintenance																																	
1 General																																	
a. Check the input power supply voltage of Main Supply or Genset																																	
2 Transmitter																																	
a. Check meter reading on DME system																																	
b. Perform Change Over Unit																																	
3 RCSU																																	
a. -																																	
4 Antenna																																	
a. -																																	
Monthly Maintenance																																	
1 General																																	
a. Clean the entire Shelter of the equipment																																	
b. Check Obstacle around the shelter																																	
c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration																																	

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
2 Transmitter																																
a. Perform Ground Check/inspection as per approved Ground Inspection Form																																
b. Check operational equipment using backup power supply																																
3 RCSU																																
a. Clean RCSU/RSU front panel																																
4 Antenna																																
a. -																																
Technician /Engineer																																
Chief/Supervisor																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Radio Navigation Aids
Equipment : Distance Measuring Equipment (DME)

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. Clean all equipment thoroughly													
2. Transmitter													
a. Perform Remote DME Certification Check													
b. Reassign Mian /Standby Transmitter													
3. RCSU													
a. Visual Inspection													
b. RCSU Operational Check													
c. Station Alarm Check													
4. Antenna													
a. -													
Semester Maintenance													
1. General													
a. -													
2. Transmitter													
a. Perform Transmitter Frequency Performance Check													
b. Receiver frequency performance check													
c. Interrogator frequency performance check													
d. Transmitter pulse performance check													
e. Transmitter power output performance check													
f. Receiver and Decoder performance check													
g. Transponder reply delay performance check													
h. Identification frequency performance check													
i. Monitor Interrogation performance check													
j. Monitor shutdown/transfer control performance check													
k. Monitor alarm integrity performance check													
3. RCSU													
a. -													
4. Antenna													
a. Perform Inspection of Antenna													
b. Clean the antenna from debris													
Yearly Maintenance													
1 General													
a. Check lightning protection and grounding system.													
b. Check condition of supply cable and control cable													

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
3. RCSU													
a. -													
4 Antenna													
a. -													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Radio Navigation Aids
Equipment : Instrument Landing System (ILS)

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Daily Maintenance																																
1 General																																
a. Check the TX room temperature																																
b. Check the power supply voltage out of the Stabilizer and UPS																																
2 Localizer																																
a. Check all indicators																																
b. Check all Monitor Indicators																																
c. Check Alarm Indicator																																
d. Check Tone Identification																																
3 Glide Path																																
a. Check all indicators																																
b. Check all Monitor Indicator																																
c. Check Alarm Indicator																																
4 RCSU																																
a. -																																
5 Antenna																																
a. -																																
Weekly Maintenance																																
1 General																																
a. -																																
2 Localizer																																
a. Check meter reading on Localizer system																																
b. Perform Change Over Unit																																
3 Glide Path																																
a. Check meter reading on Glide path system																																
b. Perform Change Over Unit																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
4 RCSU																																
a. -																																
5 Antenna																																
a. -																																
Monthly Maintenance																																
1 General																																
a. Clean the entire Shelter of the equipment																																
b. Check Obstacle around the shelter																																
c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration																																
2 Localizer																																
a. Perform Ground Check/inspection as per approved Ground Inspection Form																																
b. Check operational equipment using backup power supply																																
3 Glidepath																																
a. Perform Ground Check/inspection as per approved Ground Inspection Form																																
b. Check operational equipment using backup power supply																																
4 RCSU																																
a. Clean RCSU/RSU front panel																																
5 Antenna																																
a. Perform Inspection of Antenna																																
b. Clean the antenna from debris																																
Technician /Engineer																																
Chief/Supervisor																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility :
Equipment :
Radio Navigation Aids :
Instrument Landing System (ILS) :

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. Clean all equipment thoroughly													
2. Localizer													
a. Check Spurious Modulation													
b. Check Coverage													
c. Check Auto Transfer													
d. Reassign Main /Standby Transmitter													
3. Glide Path													
a. Check Spurious Modulation													
b. Check Coverage													
c. Check Auto Transfer													
d. Reassign Main /Standby Transmitter													
4 RCSU													
a. Visual Inspection													
b. RCSU Operational Check													
c. Station Alarm Check													
5 Antenna													
a. -													
Semester Maintenance													
1. General													
a. -													
2. Localizer													
a. Check unwanted Modulation													
3. Glide Path													
a. Check unwanted Modulation													
4 RCSU													
a. -													
5 Antenna													
a. -													
Yearly Maintenance													
1 General													
a. Check lightning protection and grounding system.													

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
b. Check condition of supply cable and control cable													
2. Localizer													
a. Check polarization													
b. Check frequency synthesizer for carrier /and clearance frequency.													
c. Check transmitter signals with respect to further parameters like harmonics or spurious													
d. Take a complete memory readout of all possible parameters													
3. Glide Path													
a. Check polarization													
b. Check carrier frequency													
c. Take a complete memory readout of all possible parameters													
4 RCSU													
a. UPS Battery Check													
5 Antenna													
a. -													
Technician /Engineer													
Chief/Supervisor													

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Surveillance Facilities
Equipment : Primary Surveillance Radar, Secondary Surveillance Radar and Monopulse Secondary Surveillance Radar.

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Daily Maintenance																																
1 General																																
a. Check the TX room temperature																																
2 Antenna																																
a. -																																
3 Transmitter																																
a. Check all indicators																																
b. Check the input voltage of some core modules contained on the panel meter																																
4 Receiver																																
a. Check the input voltage of some core modules contained on the panel meter																																
b. Check recovery time of receiver																																
c. Check noise factor																																
5 Extractor and Processing																																
a. Check all indicators																																
b. Check and observe all targets on the Radar viewer screen																																
6 Radar Maintenance Display																																
a. -																																
Weekly Maintenance																																
1 General																																
a. Clean the entire Shelter of the equipment																																
b. Check the input power supply voltage of Main Supply or Genset																																
c. Check the power supply voltage out of the Stabilizer and UPS																																
2 Antenna																																
a. -																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
3 Transmitter																																
a. Record meter reading based on BITE																																
b. Perform Change Over Unit																																
4 Receiver																																
a. Record meter reading based on BITE																																
b. Perform Change Over Unit																																
5 Extractor and Processing																																
a. Record meter reading based on BITE																																
6 Radar Maintenance Display																																
a. -																																
Monthly Maintenance																																
1 General																																
a. Check Obstacle around the shelter																																
b. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration																																
2 Antenna																																
a. Check Oil Level and evidence of oil leaks																																
b. Check for abnormal noise or vibration																																
c. Visual inspection of Moving part																																
3 Transmitter																																
a. Perform Ground Check / Inspection as per approved ground inspection form																																
b. Check and adjust Transmitter frequency																																
c. Check and Adjust Pulse Repetition Frequency																																
d. Check and Adjust all Pulse Shape																																
4 Receiver																																
a. Perform Ground Check / Inspection as per approved ground inspection form																																
b. Check RF Amplifier Gain																																
5 Extractor and Processing																																
a. -																																
6 Radar Maintenance Display																																
a. Check all indicators																																
b. Check all functions of display switch/button																																
c. Observe the synthetic view/image (track, label, character)																																
d. Check the functionality of the Key board																																
e. Check the function of Mo-use / Trackball																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
f. Check the Brightness of the screen																																
g. Check the transponder test and observe all targets on the monitor screen																																
Technician /Engineer																																
Chief/Supervisor																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name
Site Location
Facility
Equipment

SURVEILLANCE
: PRIMARY SURVEILLANCE RADAR (PSR)
SECONDARY SURVEILLANCE RADAR/
MONOPULSE SECONDARY SURVEILLANCE RADAR (SSR/MSSR)

Brand/Type :
Month :
Year :

Page 1/2

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. Clean all equipment thoroughly													
b. Check battery function by simulating a power failure													
2. Antenna													
a. -													
3. Transmitter													
a. -													
4. Receiver													
a. -													
5. Video Extractor & Processing													
a. -													
6. Radar Maintenance Display													
a. -													
Semester Maintenance													
1. General													
a. -													
2. Antenna													
a. Check for Grease antenna rotation mechanism													
3. Transmitter													
a. Calibrate all meters and indicators													
4. Receiver													
a. Calibrate all meter and indicator													
5. Extractor & Processing													
a. Check all settings of Video Extractor													
6. Radar Maintenance Display													
a. -													
Yearly Maintenance													
1. General													
a. -													
2. Antenna													
a. Check state of guides visually for oxidation of flanges													
b. Check VSWR at the guide input													
c. Check losses in the guide													
3. Transmitter													
a. -													
4. Receiver													
a. -													
5. Extractor & Processing													
a. -													
6. Radar Maintenance Display													
a. Visual inspection and Cleaning													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Automation
Equipment : ATC System

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Daily Maintenance																																
a. Check ATC System input status (AFTN, AMHS, etc)																																
b. Check Radars input status																																
c. Check server status																																
d. Check CWP's/nodes status																																
e. Check reply status																																
f. Check other related system status (I.e. simulator, traces file, billing file tape recorder, etc)																																
Weekly Maintenance																																
a. Check operational of Air Situation Display (ASD) reply																																
b. Check working light and mapping light of console desk																																
c. Clean ATC system display																																
Monthly Maintenance																																
a. Clean outpart of console and CPU of ATC System																																
b. Clean outpart of console and CPU of ATC System replay																																
c. Change over server of ATC system																																
d. Restart CWP's/nodes of ATC system																																
Technician /Engineer																																
Chief/Supervisor																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name
Site Location
Facility
Equipment

AUTOMATION
: ATC SYSTEM

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
a. Reboot server of ATC system													
b. Reboot CWP's / Nodes of ATC system													
c. reboot Server and CWP's of ATC system replay													
Semester Maintenance													
a. Update layout of ATC System													
b. Update network connection of ATC system													
c. Update layout of ATC replay System													
d. Update network connection of ATC replay system													
Yearly Maintenance													
a. Clean Inner part of CPU's server of ATC system													
b. Clean Inner part of CPU and keyboard of CWP's /Nodes													
c. Clean Inner part of CPU and keyboard of replay's server													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : ATC Simulator and CBT

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Daily Maintenance																																	
1 ATC Simulator																																	
a. -																																	
2 CBT																																	
a. -																																	
	Check working light nd console light																																
Weekly Maintenance																																	
1 ATC Simulator																																	
a. Check Simulator Status																																	
b. Check working light nd console light																																	
2 CBT																																	
a. -																																	
Monthly Maintenance																																	
1 ATC Simulator																																	
a. Clean CPU on Simulator server rack																																	
b. Clean console and CPU simulators																																	
c. Clean simulator displays																																	
d. Restart server and CWP - Sim Part																																	
2 CBT																																	
a. Clean display server and Client CBT																																	
Technician /Engineer																																	
Chief/Supervisor																																	

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name
Site Location
Facility
Equipment

AUTOMATION
: ATC SIMULATOR AND CBT

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1 ATC Simulator													
a. Reboot server and CWP of Simulator part													
2 CBT													
a. -													
Semester Maintenance													
1 ATC Simulator													
a. Update layout of Simulator													
b. Update network connection of Simulator													
2 CBT													
a. Update layout of CBT													
b. Update network connection of CBT													
Yearly Maintenance													
1 ATC Simulator													
a. clean inner part of CPU's server and keyboard of simulator													
b. Clean inner part of CPU and keyboard of CWP's /Nodes													
c. Clean inner part of CPU and keyboard of replay's server													
2 CBT													
a. Clean inner part of CPU's server and keyboard of CBT													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Automation
Equipment : Automatic Message Handling Message (AMHS)

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Daily Maintenance																																	
1 General																																	
a. -																																	
2 Supervisory																																	
a. Check the brightness																																	
b. Check the paper supplies in the printer																																	
c. Check the printer ribbon																																	
3 Reject Edit																																	
a. Check the brightness																																	
b. Check the paper supplies in the printer																																	
c. Check the printer ribbon																																	
Weekly Maintenance																																	
1 General																																	
a. Check main supply output																																	
b. Clean the entire room of the equipment																																	
2 Supervisory																																	
a. Check the printer display Introductory function																																	
b. Perform Change Over Unit																																	
3 Reject Edit																																	
a. Check printer output																																	
Monthly Maintenance																																	
1 General																																	
a. Check the output power supply voltage of UPS / Stabilizer																																	
2 Supervisory																																	
a. Check the keyboard function																																	
3 Reject Edit																																	
a. Check the keyboard function																																	
Technician /Engineer																																	
Chief/Supervisor																																	

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : AUTOMATIC MESSAGE HANDLING SYSTEM

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. Inspect all connectors													
2. Supervisory													
a. Check interconnection system													
3. Reject Edit													
a. Check interconnection system													
Semester Maintenance													
1. General													
a. -													
2. Supervisory													
a. Check the software function													
3. Reject Edit													
a. Check the software function													
Yearly Maintenance													
1. General													
a. Clean the dust on the UPS and Stabilizer													
b. Replace battery of UPS if necessary													
2. Supervisory													
a. Check the cooling fan function of the rack													
3. Reject Edit													
a. clean filter cooling system CPU													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : AUTOMATIC TERMINAL INFORMATION SERVICE

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. -													
2. Console													
a. Check the recording function													
b. Check the play back function													
3. Transmitter													
a. Measure DC level terminal with equipment condition "ON"													
Semester Maintenance													
1. General													
a. Clean the dust on the UPS and Stabilizer													
2. Console													
a. Clean air circulation filter (fan)													
3. Transmitter													
a. Checking the transmitter working frequency													
Yearly Maintenance													
1. General													
a. Check Battery of UPS, do replacement if necessary													
2. Console													
a. Check system operation thoroughly													
3. Transmitter													
a. Measurement of power output													
b. VSWR measurement													
Technician /Engineer													
Chief/Supervisor													

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
 Site Location :
 Facility : Communication
 Equipment : Very High Frequency (VHF) Air to Ground
 Transmitter Rack No. :

Brand/Type :
 Month :
 Year :

ACTIVITIES	DATE																															REMARK	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Daily Maintenance																																	
1 General																																	
a. Check the TX room temperature																																	
b. Check the power supply voltage out of the Stabilizer and UPS																																	
2 Transmitter																																	
a. Check all indicator s																																	
b. Check LCD / Main Screen Display.																																	
3 Receiver Rack																																	
a. Check all indicator																																	
b. Check LCD / Main Screen Display.																																	
4 Antenna																																	
a. -																																	
Weekly Maintenance																																	
1 General																																	
a. Clean the entire Shelter of the equipment																																	
2 Transmitter Rack																																	
a. Check meter reading based on BITE																																	
b. Check Change over switch function																																	
3 Receiver																																	
a. Check meter reading based on BITE																																	
b. Check Change over switch function																																	
4 Antenna																																	
a. -																																	
Monthly Maintenance																																	
1 General																																	
a. Check Obstacle around the shelter																																	
b. Check Obstacle around the shelter																																	
c. Perform physical check of shelter inside and out, for any sign of water filtration, damage, or other deterioration																																	

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
2 Transmitter																																
a. Perform performance check as per approved form																																
b. Check operational equipment using backup power supply																																
3 Receiver																																
a. Perform performance check as per approved form																																
b. Check operational equipment using backup power supply																																
4 Antenna																																
a. -																																
Technician /Engineer																																
Chief/Supervisor																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : VERY HIGH FREQUENCY AIR TO GROUND

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. Clean all equipment thoroughly													
2. Transmitter													
a. Perform Transmitter Power calibration													
b. Check VSWR													
c. Measure DC level terminal with ON equipment condition													
3. Receiver													
a. Measure DC level terminal with ON equipment condition													
4. Antenna													
a. -													
Semester Maintenance													
1. General													
a. -													
2. Transmitter													
a. Check the coverage range by plane													
3. Receiver													
a. -													
4. Antenna													
a. Perform antenna inspection													
Yearly Maintenance													
1. General													
a. Check lightning protection and grounding system.													
b. Check condition of power supply cable and control cable													
2. Transmitter													
a. Check all the external connector s are securely fitted													
b. Perform frequency measurement using frequency counter													
c. Perform a BIT Interruptive Test													
d. Perform an AC and DC Change over check (if both supplies are connected)													
3. Receiver													
a. Check all the external connector s are securely fitted													
b. perform frequency measurement using frequency counter													
c. Perform a BIT Interruptive Test													
d. Perform an AC and DC Change over check (if both supplies are connected)													
4. Antenna													
a. -													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : Direct Speech

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Daily Maintenance																																	
a. -																																	
Weekly Maintenance																																	
a. Check the cleanliness of IPOS and Indicators																																	
Monthly Maintenance																																	
a. Check physical equipment condition																																	
Quarterly Maintenance																																	
a. Check the connection with the related section/unit																																	
Technician /Engineer																																	
Chief/Supervisor																																	

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : Direct Speech

Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
a. Check the connection with the related section/unit													
Semester Maintenance													
a. -													
Yearly Maintenance													
a. -													
Technician /Engineer													
Chief/Supervisor													

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : Voice Recorder

Brand/Type :
Month :
Year :

ACTIVITIES	DATE																															REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Daily Maintenance																																
1 General																																
a. Check the TX room temperature																																
2 Management System																																
a. Check recording file																																
b. Check channel status indicator																																
3 Work Station																																
a. Check hardware status																																
Weekly Maintenance																																
1 General																																
a. Clean the equipment room																																
b. Clean the equipment, unit / part of equipment or module																																
c. Check main power supply																																
d. Check output UPS/backup supply																																
2 Management System																																
a. Check all events in the event log file																																
3 Work Station																																
a. Check mouse and keyboard function																																
Monthly Maintenance																																
1 General																																
a. Check UPS's battery																																
2 Management System																																
a. Do hard disk data back up																																
3 Work Station																																
a. Clean screen display																																
Technician /Engineer																																
Chief/Supervisor																																

MAINTENANCE AND REPORTING PROCEDURE FOR AERONAUTICAL
TELECOMMUNICATION FACILITIES

Initial

PREVENTIVE MAINTENANCE ACTIVITIES CHECKLIST

Airport Name :
Site Location :
Facility : Communication
Equipment : VOICE RECORDER

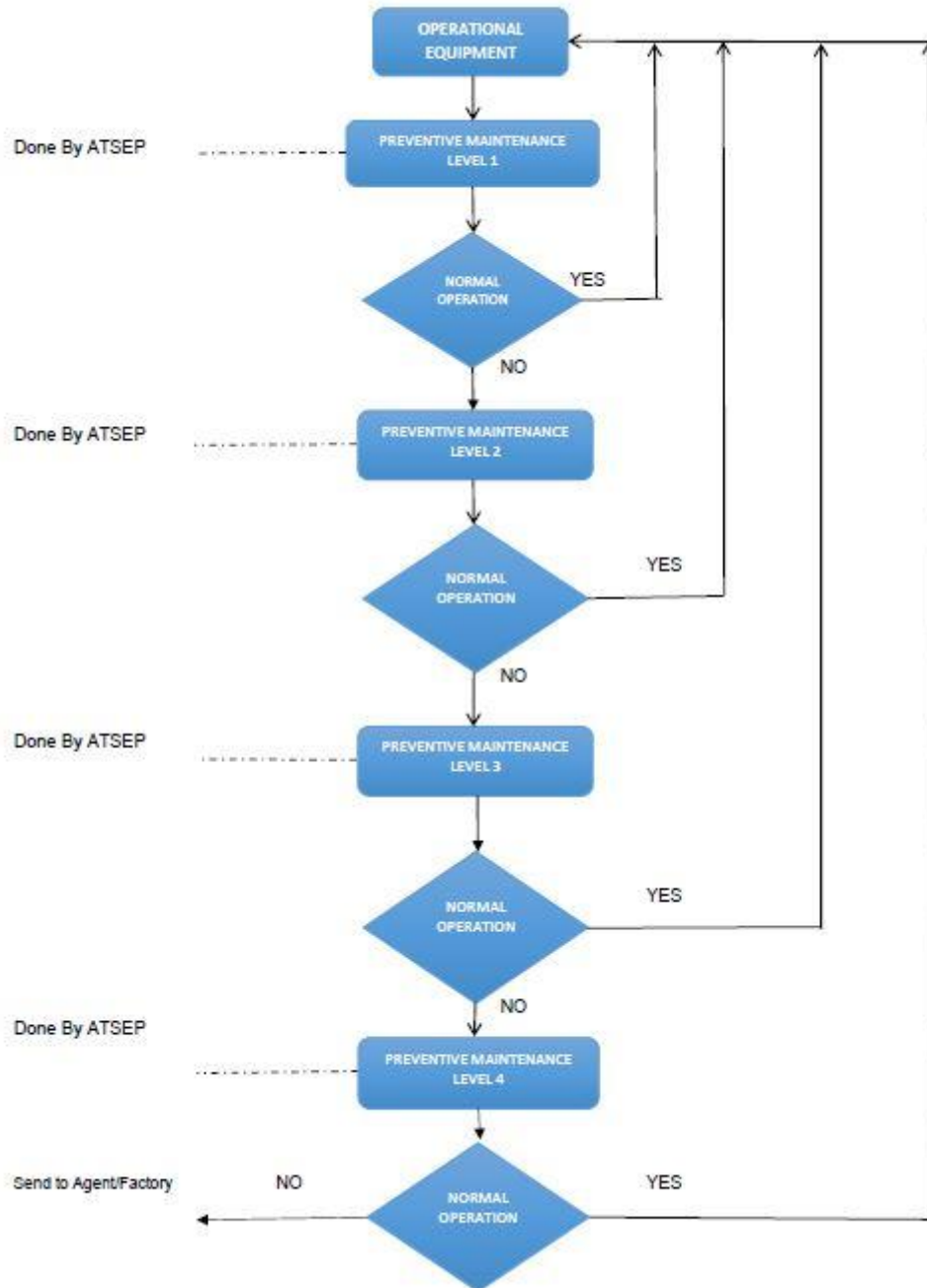
Brand/Type :
Month :
Year :

MAINTENANCE ACTIVITY	MONTH / YEAR												REMARK
	1	2	3	4	5	6	7	8	9	10	11	12	
Quarterly Maintenance													
1. General													
a. -													
2. Management System													
a. Do hard disk data cloning, if necessary													
3. Work Station													
a. Perform audio quality measurements of recorded items													
Semester Maintenance													
1. General													
a. -													
2. Management System													
a. Check performance of voice recorder software													
3. Work Station													
a. Check the PC function													
Yearly Maintenance													
1. General													
a. -													
2. Management System													
a. Check the connection from server to hardware													
b. Check replay function													
3. Work Station													
a. Check interconnection from server to hardware													
b. Perform replacement of hard disk, if needed													
Technician /Engineer													
Chief/Supervisor													

INTENTIONALLY LEFT BLANK

Appendix 3

FLOWCART PREVENTIVE MAINTENANCE AERONAUTICAL TELECOMMUNICATIO/RADIO NAVIGATION FACILITIES



INTENTIONALLY LEFT BLANK

[illegible]

INTENTIONALLY LEFT BLANK

Appendix 5

GUIDANCE ON EQUIPMENT EVALUATION

A. Facility Reliability

Facility Reliability is the probability that the ground installation operates within the specific tolerance.

1. The following formula expresses facility reliability as a percentage:

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

where:

R = reliability (probability that the facility will be operative within the specified tolerances for a time t , also referred to as probability of survival, P_s);

e = base of natural logarithms;

t = time period of interest;

m = mean time between facility failures.

Reliability increases as mean time between failures (MTBF) increases. For a high degree of reliability, and for operationally significant values of t , we must have a large MTBF; thus, MTBF is another more convenient way of expressing reliability

For example:

A navigation equipment has MTBF = 2000 hours, time period t = 1000 hours, then reliability R/ P_s of the equipment is:

$$\begin{aligned} R/P_s &= 100 e^{-1000/2000} \% \\ &= 100 e^{-1/2} \% \\ &= 60,65 \% \end{aligned}$$

2. Factors which affect MTBF and Facility Reliability are:
 - a. Inherent equipment reliability;
 - b. Degree and type of *redundancy*;
 - c. Reliability of serving utilities such as power and telephone or control lines;
 - d. Degree and quality of maintenance;
 - e. Environmental factors such as temperature and humidity.

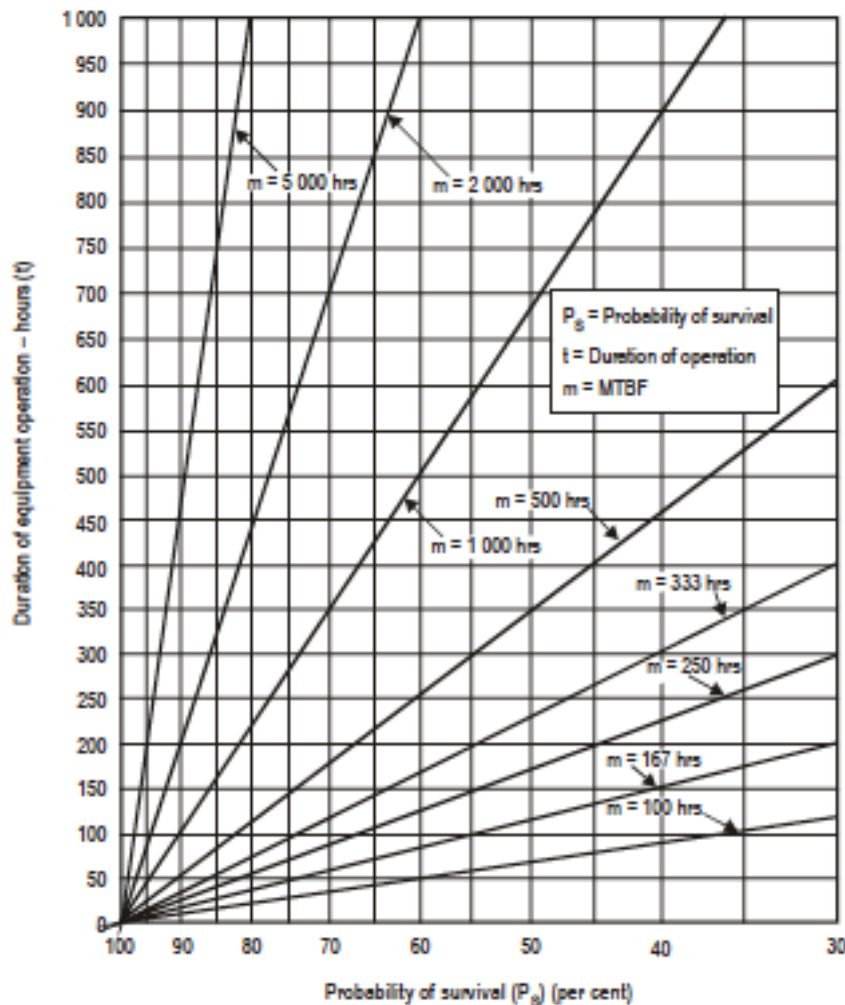


Figure - 1. Graphic $P_s = 100 e^{-t/m}$

B. Availability

1. The availability of equipment indicates the degree of readiness of an equipment or group of equipment to operate. Availability is a comparison between the actual operating time and the time of operation specified in a given period, and expressed in percent.

Expressed in the formula,

$$A = \frac{\text{Actual operating time}}{\text{The specified operating time}} \times 100 \%$$

Example : if a equipment operates normally for 700 hours from 720 hours (24 hours x 30) in a month, availability of the equipment for that month is:

$$A = \frac{700}{720} \times 100 \%$$

$$= 97.2 \%$$

2. Factors which affect the level of equipment availability are:

- facility reliability;
- quick response of maintenance personnel to failure;
- adequate training of maintenance personnel;
- equipment design providing good component accessibility and maintainability;
- efficient logistic support;
- provision of adequate test equipment;
- standby equipment and/or utilities

C. Practical Aspect of reliability and availability

The basic quantity and manner of reliability and availability measurement are indicated in Figure 2.

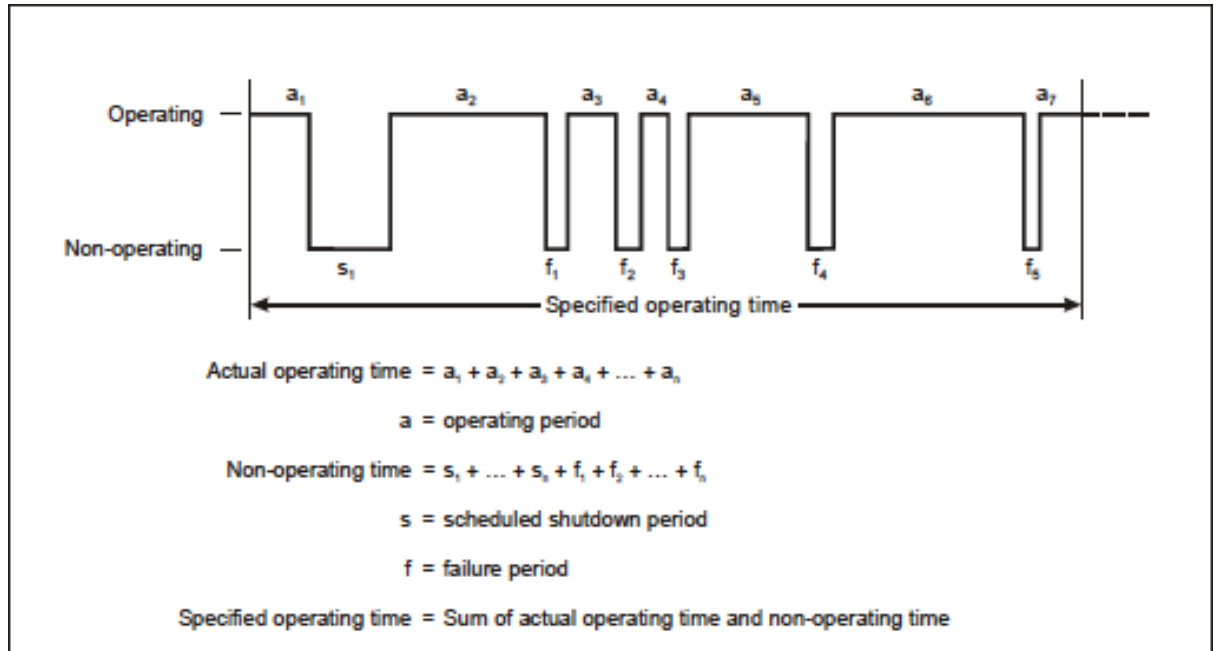


Figure 2. Evaluation of facility availability and reliability

D. Calculation of MTBF and Availability

Referred to figure 2, the calculation of the mean time between failure (MTBF) and availability (A)

Example:

$$a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 = 5540 \text{ hours}$$

$$s_1 = 20 \text{ hours}$$

$$f_1 = 2 \frac{1}{2} \text{ j hours}$$

$$f_2 = 6 \frac{1}{4} \text{ hours}$$

$$f_3 = 3 \frac{3}{4} \text{ hours}$$

$$f_4 = 5 \text{ hours}$$

$$f_5 = 2 \frac{1}{2} \text{ hours}$$

$$\text{Number of failures} = 5 \text{ times}$$

$$\text{The specified operating time} = 5580 \text{ hours}$$

$$\text{MTBF} = \frac{\text{Actual operating time}}{\text{Number of failure}}$$

$$= \frac{\sum_{i=1}^7 a_i}{5}$$

$$= \frac{5540}{5} = 1108 \text{ hours}$$

$$A = \frac{\text{Actual Operating Time}}{\text{Specified Operating Time}} \times 100 \%$$

$$= \frac{\sum_{i=1}^7 a_i \times 100}{\sum_{i=1}^7 a_i + s_1 + \sum_{i=1}^5 f_i}$$

$$= \frac{5540}{5580} \times 100 \% = 99.3 \%$$

E. Calculation of Mean Time To Repair (MTTR)

$$\text{MTTR} = \frac{\text{Total of time the equipment is not operating due to failure}}{\text{Number of Failure}}$$

$$= \frac{\sum_{i=1}^5 f_i}{5}$$

$$= \frac{2 \frac{1}{2} + 6 \frac{1}{4} + 3 \frac{3}{4} + 5 + 2 \frac{1}{2}}{5} = \frac{20}{5} = 4 \text{ hours}$$

INTENTIONALLY LEFT BLANK

Appendix 6

FACILITY PERFORMANCE MONTHLY REPORT

AIRPORT :
FACILITY :
MONTH/YEAR :

NO.	EQUIPMENT NAME	DATE																															TOTAL HOURS OF FAILURE OPERATION	REMARK
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		

Operational Color Indicator :

- | | | |
|--------------------------------------|-------|--------------|
| - Normal Operation | = O / | Green Color |
| - Intermittent / Decrease operation | = - / | Yellow Color |
| - Failure Operation | = X / | Red Color |
| - Disruption on supporting equipment | = V / | Blue Color |



Chief of Facility

INTENTIONALLY LEFT BLANK

Appendix 6A

LIST OF EQUIPMENT

AIRPORT :
FACILITY :
MONTH/YEAR :

[illegible]

NOTE : Condition (%) = (1-age of equipment in years/15)X100%

Chief of Facility

INTENTIONALLY LEFT BLANK

Appendix 6B

LIST OF CORRECTIVE MAINTENANCE ACTIVITY

AIRPORT	100
FACILITY	100
YEAR	100

[illegible]

.....p.....

CHIEF OF FACILITY

INTENTIONALLY LEFT BLANK

Appendix 6C.

FAILURE AND CORRECTIVE ACTION REPORT

NO.	DESCRIPTION	DATA
1.	Date/Month/Year	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
2.	Location/Site Name	<input type="text"/>
3.	Facility	<input type="text"/> <input type="text"/>
4.	Equipment Name	<input type="text"/> <input type="text"/>
5.	Part Of Equipment Name	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
6.	Failure Category	<input type="text"/>
7.	Failure Description	<input type="text"/>
8.	Corrective Action	By <input type="text"/> <input type="text"/> SITE <input type="text"/> FACTORY <input type="text"/> <input type="text"/>
9.	Cause of Failure	<input type="text"/>
10.	Date of Failure	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Time of Failure	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
11.	Date of Corrective Action	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	Time of Corrective Action Complete	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
12.	Total Failure Hours	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
13.	Problem Code	<input type="text"/> <input type="text"/>

Known By

CHIEF OF FACILITY?

Person in Charge of Corrective Action

Signature

Signature