AIRPORTS AUTHORITY OF INDIA

Corporate Safety Management System Manual (C-SMSM) - 2024

Document Number: **AAI-SAF-001**	
Issue Number: 4 – Revision: 0	**Effective Date: 15/01/2024**

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भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

Corporate Safety Management Manual
C-SMSM (Issue 4, Revision 0) - 2024

Document Number: **AAI-SAF-001**		
Accepted by: DGCA, India	*Approved by:* Chairman Airports Authority of India	*Prepared by:* Executive Director (AVS) Airports Authority of India
Effective Date: **15/01/2024**		

Government of India
Ministry of Civil Aviation
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New Delhi – 110003

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संदर्भ सं./Reference No.: DGCA-21030/1/2022-ANS
दिनांक/Dated: 22.12.2023

सेवा में,

अध्यक्ष
भारतीय विमानपत्तन प्राधिकरण,
राजीव गांधी भवन, सफदरजंग हवाई अड्डा,
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[ध्यानाकर्षण: श्री राजीव मेहता, कार्यपालक निदेशक (उडान सुरक्षा)]
[Kind attention: Sh.Rajeev Mehta, Executive Director (Aviation Safety)]

विषय: निगमित सुरक्षा प्रबंधन प्रणाली नियमावली संस्करण-4, संशोधन-0 स्वीकृति पत्र।
Sub: Acceptance of Corporate SMS Manual Issue-4, Rev-0.

महोदय/Sir,

कृपया आपसे प्राप्त दिनांक २०.१२.२०२३ ई-मेल एवम उपर्युक्त विषय का संदर्भ लें। आपके द्वारा प्रस्तुत भारतीय विमानपत्तन प्राधिकरण निगमित सुरक्षा प्रबंधन प्रणाली नियमावली संस्करण-4, संशोधन-0 प्रभावी तिथि १५.०१.२०२४ को इस कार्यालय द्वारा नागरिक उड्डयन विनियमन अनुभाग 1, शृंखला C, भाग I के अनुसार जांच कर स्वीकार कर लिया गया है। / Kindly refer your email dated 20.12.2023 on the subject mentioned above. Corporate Safety Management System (SMS) Manual of Airports Authority of India Issue 4 Rev 0 effective date 15.01.2024 submitted by you has been examined as per CAR Section 1 Series C Part I and same is accepted by this office.

भारतीय विमानपत्तन प्राधिकरण को यह सुझाव दिया जाता है कि भविष्य में इस कार्यालय को सूचित करते हुए इस नियमावली संस्करण को समय - समय पर नवीनतम नियम, नागरिक उड्डयन विनियमन और परिपत्र संशोधन सम्मिलित कर अद्यतन रखा जाये। Airports Authority of India is advised to keep the manual updated and incorporate all the latest amendments w.r.t. Rules, CAR, Circulars etc. issued from time to time in future under the intimation to this office.

भवदीय,

(रविंदर सिंह जामवाल)
निदेशक (प्रचालन)(एएनएसएस)
कृते महानिदेशक, नागर विमानन

PREFACE

The Airports Authority of India (AAI) provides Airport Operations services at various Airports and Air Navigation Services in entire Indian Administered Air Space in a safe manner. AAI ensures implementation of the Safety Management System (SMS) in line with ICAO and DGCA guidelines to meet the safety requirements.

A Safety Management System (SMS) is a systematic approach to manage safety in any organization by following four components and twelve elements of ICAO framework. Airports Authority of India had developed its first Corporate Safety Management System Manual (C-SMSM) in the year 2005 based on best industry practices then prevailing.

Subsequently, AAI revised its Corporate Safety Management System Manual and issued various C-SMSM version in year 2009, 2012, 2013 and 2015 harmonizing with standards and recommended practices issued by ICAO and DGCA from time to time.

ICAO adopted the Annex 19 (Safety Management), II edition in year 2016 and there after published Safety Management Manual (Doc 9859), edition-IV in year 2018.

The National Aviation Safety plan (NASP) for year 2018-2022 was issued by DGCA on 30th August 2018 and the State Safety Plan (SSP), edition-II in June' 2021. The DGCA CAR, Issue-III on SMS was revised and issued on 24th March 2022 as per which, the service providers were made responsible for implementation of SMS in their respective organizations.

As AAI is the sole ANSP and airport operator at several airports in India, hence, the Corporate SMS Manual is now updated as C-SMSM issue -4 , Revision-0 in line with guidelines contained in above cited documents.

The purpose of this manual is to provide complete guidance to all stakeholders in AAI for complying with the national and international regulations on SMS. It details practices and procedures to meet these regulations and contain relevant templates and forms as well.

I am sure that with the continued compliance of the provisions and guidance in this document, the sky and the Indian airports will be much safer for the passengers and all stakeholders. Let us focus on **"SAFETY FIRST".**

Sanjiv Kumar

(Sanjeev Kumar)
Chairman

AMENDMENT RECORD

On receipt of each new amendment to this document, the holder must complete all details on the amendment record sheet below.

Amendment Number	Section Amended	Page no.	Effective date	Amended by
Version 1- Issue 1	Initial Issue		25/11/2005	
Version 2 – Issue 1	Second edition		20/05/2009	ASD
Version 3 – Issue 1	Third Version		12/06/2012	ASD
Version 3 – Issue 2	Issue-2		20/05/2013	ASD
Version 3 – Issue 3	Issue-3		28/10/2015 (submitted to DGCA for acceptance)	ASD
			18/11/2015 (DGCA observations incorporated)	ASD
Issue 4 – Revision 0	Manual revised	All pages	15/01/2024	ASD

CORPORATE SAFETY MANAGEMENT DOCUMENTATION LIST

Document Number	Title	Description
000 Series 001-099 and 300 onwards.	Safety Management System Manuals [Corporate Safety Management System Manual (C-SMSM) and Safety Management System Manuals (SMSM) of Licensed Aerodromes, Civil Enclave and/or Unit/Location]	To be Registered by Aviation Safety Directorate
100 Series 100-199	Corporate Safety Management Documents and Forms	To be Registered by Aviation Safety Directorate
200 Series 200-299	Other Corporate Documents	To be Registered by Aviation Safety Directorate

Series 001-099	Safety Management System Manual (SMSM)	Description
AAI-SAF-0XX	SMSM <<Unit/Location>>	Safety Management System Manual-<<Unit/Location>>
AAI-SAF-001	Corporate SMS Manual	Corporate Safety Management System Manual
AAI-SAF-002	S-SMSM ATS Mumbai	
AAI-SAF-003	Spare	
AAI-SAF-004	S-SMSM ATS IGI Airport – Delhi	
AAI-SAF-005	Spare	
AAI-SAF-006	S-SMSM Airside Operation, NSCBI Airport Kolkata	
AAI-SAF-007	S-SMSM ATS, NSCBI Airport, Kolkata	
AAI-SAF-008	S-SMSM ATS, Chennai	
AAI-SAF-009	S-SMSM Airside Operations, Chennai Airport	
AAI-SAF-010	S-SMSM (ANS) Nagpur	
AAI-SAF-011	Spare	
AAI-SAF-012	S-SMSM ATS, Ahmedabad	
AAI-SAF-013	S-SMSM ATS and Airport Operations, Coimbatore	
AAI-SAF-014	S-SMSM ATS, Guwahati	

AAI-SAF-015	S-SMSM ATS, Jaipur	
AAI-SAF-016	S-SMSM ATS and Airport Operations, Hyderabad (Begumpet)	
AAI-SAF-017	S-SMSM ATS, Mangalore	
AAI-SAF-018	S-SMSM ATS and Airport Operations, Agartala	
AAI-SAF-019	S-SMSM ATS and Airport Operations, Safdarjung Airport (Spare)	
AAI-SAF-020	S-SMSM ATS and Airport Operations, Trivandrum	
AAI-SAF-021	S-SMSM ATS and Airport Operations, Imphal	
AAI-SAF-022	S-SMSM ATS, Lucknow	
AAI-SAF-023	S-SMSM ATS and Airport Operations, Dimapur	
AAI-SAF-024	S-SMSM ATS and Airport Operations, Udaipur	
AAI-SAF-025	S-SMSM ATS and Airport Operations, Varanasi	
AAI-SAF-026	S-SMSM ATS Cochin	
AAI-SAF-027	S-SMSM ATS, Bangalore	
AAI-SAF-028	S-SMSM ATS and Airport Operations, Bhubaneshwar	
AAI-SAF-029	S-SMSM ATS and Airport Operations, Amritsar	
AAI-SAF-030	S-SMSM ATS and Airport Operations, Calicut International Airport	
AAI-SAF-031	S-SMSM ATS and Airport Operations, Raipur	
AAI-SAF-032	S-SMSM ATS and Airport Operations, Indore	
AAI-SAF-033	S-SMSM ATS and Airport Operations, Gaya	
AAI-SAF-034	S-SMSM ATS and Airport Operations, Bhopal	
AAI-SAF-035	S-SMSM ATS and Airport Operations, Trichy	
AAI-SAF-036	S-SMSM ATS and Airport Operations, Dibrugarh	
AAI-SAF-037	S-SMSM ATS and Airport Operations, Patna	
AAI-SAF-038	Spare	
AAI-SAF-039	S-SMSM ATS and Airport Operations, Mysore	

AAI-SAF-040	S-SMSM ATS and Airport Operations, Shimla	
AAI-SAF-041	S-SMSM ATS and Airport Operations, Kullu (Bhuntar)	
AAI-SAF-042	S-SMSM ATS and Airport Operations, Pantnagar	
AAI-SAF-043	S-SMSM ATS and Airport Operations, Kangra	
AAI-SAF-044	S-SMSM ATS and Airport Operations, Kolhapur	
AAI-SAF-045	S-SMSM ATS and Airport Operations, Tirupati	
AAI-SAF-046	S-SMSM ATS and Airport Operations, Madurai	
AAI-SAF-047	S-SMSM ATS and Airport Operations, Ranchi	
AAI-SAF-048	S-SMSM ATS and Airport Operations, Tuticorin	
AAI-SAF-049	S-SMSM ATS and Airport Operations, Barapani (Shillong)	
AAI-SAF-050	S-SMSM ATS and Airport Operations, Surat	
AAI-SAF-051	S-SMSM ATS and Airport Operations, Jalgaon	
AAI-SAF-052	S-SMSM ATS and Airport Operations, Rajahmundry	
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AAI-SAF-057	S-SMSM ATS and Airport Operations, Bhavnagar	
AAI-SAF-058	S-SMSM ATS and Airport Operations, Selam	
AAI-SAF-059	S-SMSM ATS and Airport Operations, Porbandar	
AAI-SAF-060	S-SMSM ATS and Airport Operations, Kishangarh	
AAI-SAF-061	S-SMSM ATS and Airport Operations, Pakyong	
AAI-SAF-062	S-SMSM ATS and Airport Operations,	

	Jagdalpur	
AAI-SAF-063	S-SMSM ATS and Airport Operations, Solapur	
AAI-SAF-064	S-SMSM ATS and Airport Operations, Juhu	
AAI-SAF-065	S-SMSM ATS and Airport Operations, Aurangabad	
AAI-SAF-066	S-SMSM ATS and Airport Operations, Keshod	
AAI-SAF-067	S-SMSM ATS and Airport Operations, Diu	
AAI-SAF-068	S-SMSM ATS and Airport Operations, Tezu	
AAI-SAF-069	Spare	
AAI-SAF-070	SSMM ATS, Shamshabad	
AAI-SAF-071	S-SMSM ATS and Airport Operations, Kadapa	
AAI-SAF-072	S-SMSM ATS and Airport Operations, Khajuraho	
AAI-SAF-073	S-SMSM ATS and Airport Operations, Hubballi	
AAI-SAF-074	S-SMSM ATS and Airport Operations, Jabalpur	
AAI-SAF-075	S-SMSM ATS and Airport Operations, Coach Behar	
AAI-SAF-076	S-SMSM ATS and Airport Operations, Civil Aerodrome Belgaum	
AAI-SAF-077	S-SMSM ATS and Airport Operations, Agatti	
AAI-SAF-078	S-SMSM ATS and Airport Operations, Vijayawada	
AAI-SAF-079	S-SMSM ATS and Airport Operations, Lilabari	
AAI-SAF-080	S-SMSM, Tezpur (Civil Enclave)	
AAI-SAF-081	S-SMSM, Jammu (Civil Enclave)	
AAI-SAF-082	S-SMSM, Vishakhapatnam (Civil Enclave)	
AAI-SAF-083	S-SMSM, Srinagar International Airport (Civil Enclave)	
AAI-SAF-084	S-SMSM ATS and Airport Operations, Rupsi Airport	
AAI-SAF-085	S-SMSM, Jamnagar Airport (Civil Enclave)	
AAI-SAF-086	S-SMSM ATS and Airport Operations, Kalburgi Airport	

AAI-SAF-087	S-SMSM ATS and Airport Operations, Kushinagar Airport	
AAI-SAF-088	S-SMSM, Bhuj Airport (Civil Enclave)	
AAI-SAF-089	S-SMSM ATS and Airport Operations, Deogarh Airport	

Series 100-199 Corporate Safety Management Documents & Forms		
Document No.	**Title**	**Description**
AAI-SAF-101	Voluntary/Confidential Reporting Form	Voluntary Report
AAI-SAF-102	Left Blank	
AAI-SAF-103	Safety Case Assessment and Reporting System Form	SCARS Form
AAI-SAF-104	Preparation of Safety Case and safety Plan	
AAI-SAF-104A & B	Safety Plan & Safety Case Template-All phases	
AAI-SAF-105	Hazard Identification & Analysis Form	HAZID Form
AAI-SAF-106	Left Blank	
AAI-SAF-107	SMS Gap Analysis	
AAI-SAF-108	Aviation Safety Module in AIMS	AIMS portal
AAI-SAF-109	SMS Implementation Plan	Phase-wise SMS Implementation Plan

Series 100-199 Corporate Safety Management Documents & Forms		
Document No.	**Title**	**Description**
AAI-SAF-110	Form for communicating with DGCA Refer DGCA AD AC 1 of 2012	Undertaking to DGCA
AAI-SAF-111	Project/Operational Risk Register	PRR/ORR
AAI-SAF-112	Left Blank	
AAI-SAF-113	Left Blank	
AAI-SAF-114	Left Blank	
AAI-SAF-115	Left Blank	
AAI-SAF-116	Left Blank	
AAI-SAF-117	Left Blank	
AAI-SAF-118	Left Blank	
AAI-SAF-119	Left Blank	
AAI-SAF-120	Left Blank	
AAI-SAF-121	Audit Notification Form	Audit notification form
AAI-SAF-122	Audit opening /closing meeting format	Audit Meeting form
AAI-SAF-123	Audit Report	Audit Report
AAI-SAF-124	Audit Request for Corrective Action (RCA) form	Request for Corrective Action form
AAI-SAF-125	Audit Feedback form	Audit Feedback
AAI-SAF-126	Quarterly report on RCA	Quarterly Report on RCA
AAI-SAF-127	Hazard Register (HAZLOG)	HAZLOG
AAI-SAF-128	SPT/SPI package format of AAI	

DISTRIBUTION LIST - CORPORATE SMS MANUAL

The list below describes the persons and organizations receiving the C-SMS Manual issued by CHQ in hard copy and soft controlled copy: -

A. Controlled Copy

Master Copy	Executive Director (Aviation Safety)	
1.	DGCA, New Delhi	
2.	Chairman, AAI, New Delhi	
3.	Member (ANS)	
4.	Member (Ops.)	
5.	Member (Planning)	
6.	Member (HR)	
7.	Member (Finance)	
8.	Executive Director (ATM)	
9.	Executive Director (ATM-CAP)	
10.	Executive Director (ATM-ASM)	
11.	Executive Director (ATM-ATFM)	
12.	Executive Director (CNS-OM)	
13.	Executive Director (Aerodrome Planning)	
14.	Executive Director (CNS-Planning)-I	
15.	Executive Director (CNS-Planning)-II	
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17.	Executive Director (Engineering) All regions	
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21.	Regional Executive Director (WR)	
22.	Regional Executive Director (SR)	
23.	Regional Executive Director (ER)	
24.	Regional Executive Director (NER)	

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Annexures

GLOSSARY OF TERMS

ABBREVIATIONS		
1.	AAI	Airports Authority of India
2.	AAIB	Aircraft Accident Investigation Bureau
3.	ACS	Aeronautical Communication Station
4.	ADS	Automatic Dependent Surveillance
5.	ADP	Airport Driving Permit
6.	ADREP	Accident/Incident data reporting
7.	AEMC	Aerodrome Environment Management Committee
8.	AFTN	Aeronautical Fixed Telecommunication Network
9.	AGA	Aerodromes & Ground Aids
10.	AIP	Aeronautical Information Publication
11.	AIMS	Airport Information Management System
12.	AIRAC	Aeronautical Information Regulations and Control
13.	AIS	Aeronautical Information Service
14.	ALARP	As Low As Reasonability Practicable
15.	AMSS	Automatic Message Switching System
16.	ANS	Air Navigation Services
17.	ARFF	Airport Rescue & Fire Flighting
18.	ASMGCS	Advance Surface Movement Guidance and Control System
19.	ATCAS	Air Traffic Control Automation System
20.	ATCO	Air Traffic Control Officer
21.	ATM	Air Traffic Management
22.	ATS	Air Traffic Services
23.	ATSEP	Air Traffic Safety Electronic Personnel
24.	AVS	Aviation Safety
25.	CANSO	Civil Air Navigation Services Organization
26.	CAR	Civil Aviation Requirements
27.	CBA	Cost benefit Analysis
28.	CDM	Collaborative decision making
29.	CNS	Communication, Navigation and Surveillance
30.	CPDLC	Controller Pilot Data Link Communication
31.	C-SMSM	Corporate Safety Management System Manual
32.	DGCA	Director General of Civil Aviation
33.	DME	Distance Measuring Equipment
34.	DMS	Data Management System
35.	DVOR	Doppler VHF Omni Range
36.	DVTR/DVR	Digital Voice Tape Recorder/Digital Voice Recorder
37.	ECRP	Emergency Contingency Response Plan
38.	FDA	Flight Data Analysis
39.	FIR	Flight Information Region

40.	FIU	Flight Inspection Unit
41.	FMEA	Failure Mode and Effects Analysis
42.	FOD	Foreign Object Debris
43.	FSTC	Fire Service Training Center
44.	FTC	Fire Training Center
45.	GLF	Ground Lighting Facilities
46.	HAZLOG	Hazard Log or Data Base or Electronic Data Base of Hazards
47.	HAZID	Hazard Identification
48.	HIRM	Hazard Identification and Risk Management
49.	ICAO	International Civil Aviation Organisation
50.	ILS	Instrument Landing System
51.	IMD	India Meteorological Department
52.	LOA	Letter of Agreement
53.	LVP	Low Visibility Procedures
54.	MATS	Manual of Air Traffic Services
55.	MET	Meteorology
56.	MSSR	Monopulse Secondary Surveillance Radar
57.	NOC	No Objection Certificate
58.	NOTAM	Notice to Airmen
59.	OPS	Operations
60.	ORA	Operational Risk Assessment
61.	PBN	Performance Based Navigation
62.	PHA	Preliminary Hazard Analysis
63.	PIR	Post Implementation Review
64.	RADAR	Radio Detection and Ranging
65.	RCA	Request for Corrective Action
66.	RVR	Runway Visual Range
67.	SARPS	Standards and Recommended Practices
68.	SAR	Search and Rescue
69.	SCARS	Safety Case Assessment and Reporting System
70.	SD	Standard Deviation
71.	SDCPS	Safety data collection and processing systems
72.	SME	Subject Matter Expert
73.	SMS	Safety Management System
74.	SMSM	Safety Management System Manual
75.	SPI	Safety Performance Indicator
76.	SPT	Safety Performance Target
77.	SQMS	Standards, Quality Management & Safety
78.	SRM	Safety Risk Management
79.	SSO	Shift Supervisory Officer
80.	SSP	State Safety Policy
81.	SSR	Secondary Surveillance Radar
82.	TX/RX	Transmitter/Receiver

83.	VCCS	Voice Control and Communication System
84.	WSO	Watch Supervisory Officer

Definitions

When the following terms are used in the manual, they have the meanings indicated below.

Accident. An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:
a) a person is fatally or seriously injured as a result of:
— being in the aircraft, or
— direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
— direct exposure to jet blast,
except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
b) the aircraft sustains damage or structural failure which:
— adversely affects the structural strength, performance or flight characteristics of the aircraft, and
— would normally require major repair or replacement of the affected component,
except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or
c) the aircraft is missing or is completely inaccessible.

Acceptable level of safety performance (ALoSP): The minimum level of safety performance of civil aviation in a State, as defined in its State safety programme, or of a service provider, as defined in its safety management system, expressed in terms of safety performance targets and safety performance indicators.

Accountable executive: A single, identifiable person having responsibility for the effective and efficient performance of the State's SSP or of the service provider's SMS.

Accountability – A relationship that exists between two people or groups of people, the person held accountable and the person to whom they are accountable. Accountability exists where:

- An outcome is defined,
- Responsibility is clear and Appropriate authority is granted.

Accountability versus Responsibility – An employee is responsible for his/her actions in performing an activity whereas they are accountable to someone for the outcome of the activity being performed.

Air Navigation Services (ANS) – Means air traffic services; communication, navigation and surveillance services; meteorological services for air navigation; and aeronautical information services.

Air Navigation Services Units - means units providing Air Navigation Services (Air Traffic Services and CNS services)

Authority – The power to give orders, directions and to make key decisions.

Change management: A formal process to manage changes within an organization in a systematic manner, so that changes which may impact identified hazards and risk mitigation strategies are accounted for, before the implementation of such changes.

Consequence of Hazard - The potential outcome (or outcomes) of a hazard.

Controlled copy – is a current copy of the document that is managed through a Document Management System.

Defences: Specific mitigating actions, preventive controls or recovery measures put in place to prevent the realization of a hazard or its escalation into an undesirable consequence.

Errors: An action or inaction by an operational person that leads to deviations from organizational or the operational person's intentions or expectations.

Event Report – **(Internal Report)**

An event is defined as an occurrence that is not an accident or incident which if left untreated:

- could lead to an accident or incident; or
- has the ability to compromise the integrity of the ATS and Airports system.

Gap analysis: A gap analysis is basically an analysis of the safety arrangements already existing within the organization as compared to those necessary for SMS function

Hazard. A condition or an object with the potential to cause or contribute to an aircraft incident or accident (Annex 19, 2nd edition).

Hazard Identification and Analysis Form (HAZID Form-AAI-SAF-105): A form where hazards, their consequences, risks & controls are recorded.

Hazard Register (HAZLOG) – An electronic application or a paper-based system for the storage of active hazard, their source, consequences, safety risk assessment, existing and potential risk measures, residual risk accepting authority, review period, etc. In AAI, it is HAZLOG template in AAI-SAF-127 format.

Incident. An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Positive Safety Culture: It is a culture in which personnel are not punished for actions, omissions or decisions taken by them which are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.

Master copy – is the signed approved hardcopy of the document, to be stored on an official AAI file.

Master electronic copy - is the electronic copy of the master document that is stored on the network, in the format in which it was developed to be available to facilitate future revisions.

Operational personnel: Personnel involved in aviation activities who are in a position to report safety information.
Note.— Such personnel include, but are not limited to: flight crews; air traffic controllers; aeronautical station operators; maintenance technicians; personnel of aircraft design and manufacturing organizations; cabin crews; flight dispatchers, apron personnel and ground handling personnel.
Operational Risk Assessment (ORR) register (AAI-SAF-111): A Risk register for the operational phase of the project where the residual risks of project (concept, design, Execution & commissioning phase) are transferred and new hazard identified during the continuation of operations by operational personnel are recorded and thereafter periodically reviewed by the Safety Manager.
Responsibility –The state of ownership resulting from the performance of an activity or action.
Risk mitigation: The process of incorporating defences or preventive controls to lower the severity and/or likelihood of a hazard's projected consequence.
Safety. The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.
Safety Audit: A systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.
Safety Case - A structured document that provides an argument supported by evidence that a major change will be safe to implement
Safety data. A defined set of facts or set of safety values collected from various aviation related sources, which is used to maintain or improve safety.
Note. — Such safety data is collected from proactive or reactive safety-related activities, including but not limited to:
a) accident or incident investigations, b) safety reporting, c) continuing airworthiness reporting, d) operational performance monitoring, e) inspections, audits, surveys or f) safety studies and reviews
S**afety information:** Safety data processed, organized or analysed in a given context so as to make it useful for safety management purposes.
Safety Plan - A written plan of all the safety management activities that are planned to occur prior to introducing the change
Safety Risk -The predicted probability and severity of the consequences or outcomes of a hazard (Annex 19, 2nd edition).
Safety Risk Control - Measures to address the hazard and bring the assessed risk under organizational control.
Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.
Safety oversight. A function performed by a State to ensure that individuals and organizations performing an aviation activity comply with safety-related national laws and regulations.
Safety performance. A State or a service provider's safety achievement as defined by its safety performance targets and

safety performance indicators.

Safety performance indicator. A data-based parameter used for monitoring and assessing safety performance.

***Safety performance target*.** The State or service provider's planned or intended target for a safety performance indicator over a given period that aligns with the safety objectives.

State safety programme (SSP). An integrated set of regulations and activities aimed at improving safety.

Confidential Report

Confidential reporting systems aim to protect the identity of the reporter. This is one way of ensuring that the voluntary reporting system is non-punitive. Confidentiality is achieved by de-identification of the report. Confidential reports return to the user without the identifying part of the reporting form and no record are kept of these details. Confidential reporting system facilitates the disclosure of human errors, enabling others to learn from mistakes made, without fear of
retribution or embarrassment.

Process Owner: A Process Owner is the one who is responsible for managing and overseeing the objectives and performance of a process. He / She has the authority to make required changes related to achieving process objectives. In many cases Process owner is also the proposer / initiator of the change.

- In the airport context, the process owners will be HODs (Head of Department) of ATM, CNS and Airside Operations (OPS). Since ARFF (Airport Rescue and Fire Fighting) is technically under OPS section, Head-ARFF is not considered as a separate Process Owner.

Project Manager: A Project Manager is the person responsible for leading a project from its inception to execution. This includes planning, execution and managing the people, resources and scope of the project.

Project manager has the responsibilities to satisfy the process owner regarding achievement of the process objectives (Operational Requirements)

For example, Airside Operations project, the Project Manager can be from Civil Engineering (runway extension), Electrical Engineering (Installation of Cat II approach Lights), ARFF (upgradation of RFF category from 7 to 8), Electronics (optical fibre cabling in the operational area), OPS (closure of Runway / Apron) etc.

Reportable Occurrence: Any incident which endangers or which, if not corrected, would endanger an aircraft, its occupants or any other person.

A. Purpose of the Manual

The purpose of this document is to provide guidance for the establishment of Safety Management System in Airports Authority of India in accordance with ICAO and DGCA regulations and guidelines. This manual sets safety requirements which must be met to achieve this objective. It also details the processes and procedures to achieve these safety requirements, which are essential for the safe and efficient Air Navigation Services & Airport Operations in Indian administered air space and at airports, where services are provided by AAI. It is published for the use and guidance of AAI personnel.

B. Scheme of Safety Manuals in AAI

Corporate SMS Manual has been developed for the AAI and is applicable at all its locations/aerodromes and Air Navigation Services Centres. The safety accountabilities, responsibilities and authorities of top management including Board Members of AAI have been documented in Corporate SMS Manual.

Each licensed aerodrome, aerodrome applying for Aerodrome license, Civil Enclaves and Air Navigation Service centres are required to develop their Safety Management System (SMS) Manual. SMS Manual should document Safety Accountabilities, responsibilities and authorities of top Management of the aerodrome/location including all HODs. It may also include all local practices to improve and enhance safety that are being practiced at aerodrome/location.

Where AAI is providing both air navigation services and aerodrome operations, a single Safety Management System Manual covering both the aspects, may be developed. For larger aerodromes / locations separate Safety management System Manuals, one for Air Navigation Services and another for Aerodrome operations may be developed. Since some of the functions in the both Safety management System manuals may overlap, it shall be advisable to make these manuals compatible to each other.

At Civil Enclaves managed by AAI, the safety accountabilities, responsibilities and authorities of local management should be documented in S-SMS manual of the civil enclave for the operational area under the jurisdiction of Airports Authority of India. All guidelines contained in Corporate Management System Manual shall be followed.

D. Scope of the Manual

This Corporate SMS Manual of AAI is applicable at all aerodromes/locations and Air Navigation Service centres managed by AAI. It applies to all AAI employees, and AAI's various directorates whose activities may directly or indirectly have a bearing on the safety of Air Navigation Services or Aerodrome Operations

E. Limitations to the Scope of SMS

This SMS Manual is NOT specifically designed to cover issues outside the scope of aviation hazards; such as occupational health and safety requirements, security requirements, or other non-airside activities such as terminals. However, any facet of Terminal Building e.g. Aerobridges, design or structure which may directly or indirectly affect aircraft safety, shall be covered by this SMS.

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

संरक्षा नीति

हम, भारतीय विमानपत्तन प्राधिकरण में संरक्षा को अपनी व्यावसायिक प्राथमिकता मानते हैं। हम अपने संगठन में सुरक्षा के उच्चतम उचित मानक सुनिश्चित करने के लिए रणनीतियों और प्रक्रियाओं को विकसित करने, लागू करने, बनाए रखने और लगातार सुधार करने के लिए प्रतिबद्ध हैं।

बिना किसी अपवाद के हमारे सभी कर्मचारी अपनी सेवा प्रदान करते समय संरक्षा के लिए जवाबदेह और जिम्मेदार हैं।

हमारी प्रतिबद्धता है:

- अंतरराष्ट्रीय और राष्ट्रीय मानकों के विनियमों और आवश्यकताओं का **अनुपालन** करना और जहाँ भी संभव हो उसे बेहतर करना और संरक्षा पर सर्वोत्तम उद्योग प्रथाओं को अपनाना ।
- संरक्षा के कार्यान्वयन और प्रबंधन का समर्थन करने के लिए आवश्यक मानव और वित्तीय, दोनों उपयुक्त संसाधन **प्रदान** करना।
- प्रबंधन के सभी सदस्यों सहित अपने सभी कर्मचारियों की संरक्षा जवाबदेही, जिम्मेदारियों और प्राधिकारों को पूरे संगठन में **परिभाषित**, आलेखित और संप्रेषित करना ।
- **यह सुनिश्चित** करना कि हमारे सभी कर्मचारी अपनी भूमिकाओं और जिम्मेदारियों के लिए पर्याप्त रूप से और उचित रूप से प्रशिक्षित हैं, संरक्षा मामलों में सक्षम हैं और ऐसा बने रहते हैं, और उन्हें केवल उनके कौशल के अनुरूप कार्य आबंटित किए जाते हैं ।
- सकारात्मक संरक्षा संस्कृति को **पोषित** करना, जिसमें हमारे कर्मचारियों को किसी दंडात्मक कार्रवाई के डर के बिना उनकी संरक्षा चिंताओं या त्रुटियों को रिपोर्ट करने के लिए प्रोत्साहित किया जाता है, हालांकि, संरक्षा नियमों और विनियमों की घोर लापरवाही या जानबूझकर या स्वेच्छा से अवहेलना करने का कार्य अनुशासनात्मक कार्रवाई के अधीन है।
- हमारे संरक्षा निष्पादन में निरंतर सुधार लाने के लिए खतरों, घटनाओं और दुर्घटनाओं पर आंकड़ों की रिपोर्टिंग, संग्रह, विश्लेषण और भंडारण के लिए व्यापक प्रक्रिया की **स्थापना और प्रचालन** करना ।
- नियमित रूप से निगरानी और वास्तविक संरक्षा निष्पादन संकेतकों और संरक्षा निष्पादन लक्ष्यों के मापन के माध्यम से हमारे संरक्षा निष्पादन में **लगातार सुधार** करना ।
- **यह सुनिश्चित करना** कि बाहरी आपूर्तिकर्ताओं या ठेकेदारों द्वारा प्रदान की गई सुविधाएं, उपकरण और सेवाएं हमारे संगठन के संरक्षा निष्पादन मानकों और आवश्यकताओं को पूरी करती हों ।
- विमानन संरक्षा में सुधार करने के लिए सभी हितधारकों के साथ हमारी आंतरिक रिपोर्टिंग प्रणाली द्वारा तैयार संरक्षा जानकारी को **साझा** करना ।
- हमारे निर्धारित संरक्षा निष्पादन संकेतकों और लक्ष्यों की समय-समय पर प्रभावकारिता, संरक्षा प्रबंधन प्रणाली और संरक्षा नीति की **समीक्षा** करना ताकि हमारे संगठन को बदलते संरक्षा वातावरण के अनुकूल बनाया जा सके।

संजीव कुमार

(संजीव कुमार)
अध्यक्ष

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

SAFETY POLICY

We, in Airports Authority of India regard safety as one of our core business functions. We are committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure highest reasonable standard of safety within our organization.

All our employees without any exception are accountable and responsible for safety while delivering our service.

Our commitment is to:

- Comply with and wherever possible exceed international and national standards, regulations & requirements and adopt best industry practices on safety.
- Provide appropriate resources both human and financial necessary to support the implementation & management of safety.
- Define, document and communicate throughout the organization the safety accountabilities, responsibilities and authorities of all its employees including all members of management.
- Ensure that all our employees are adequately & appropriately trained for their roles & responsibilities, are competent in safety matters and continue to remain so, and are allocated only tasks commensurate with their skills.
- Foster positive safety culture in which our employees are encouraged to report their safety concerns or errors without the fear of any punitive action. However, an act of gross negligence or deliberate or wilful disregard of safety rules and regulations shall be subject to disciplinary action.
- Establish & Operate a comprehensive procedure for reporting, collection, analysing and storing of data on Hazards, incidents and accidents to achieve continuous improvement in our safety performance.
- Continuously improve our safety performance through regular monitoring and measurement of realistic safety performance indicators and safety performance targets.
- Ensure that the facilities, equipment and services provided by external suppliers or contractors meet the safety performance standards and requirements of our organization.
- Share safety information generated by our internal reporting mechanism with all stake holders to improve aviation safety.
- Review periodically efficacy of our set Safety Performance Indicators & Targets, Safety Management System, and Safety Policy to enable our Organization to adapt to changing safety environment.

Sanjiv Kum

(Sanjeev Kumar)
Chairman

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

संरक्षा उद्देश्य

भारतीय विमानपत्तन प्राधिकरण द्वारा :

- सुनिश्चित करना कि, विमान यातायात सेवाओं को इस तरीके से निष्पादित किया जाए जहां किसी भी विमान दुर्घटना / घटना का जोखिम कम हो या विमान यातायात की अधिकता के बावजूद इसे जहां तक व्यावहारिक रूप से उचित स्तर तक या उससे कम बनाए रखा जाए ।
- सुनिश्चित करना कि सभी दिक्चालन, संचार और निगरानी सहायक कार्य डिजाइन विनिर्देशों के अनुसार कार्य करते हैं और उचित प्राधिकारी द्वारा परिभाषित विश्वसनीयता और उपलब्धता के आवश्यक स्तर को पूरा करते हैं ।
- सुनिश्चित करना कि एयरसाइड प्रचालन में उचित स्तर पर संरक्षा बनाए रखी जाए, जिसमें सभी एयरोड्रोम पर कार्गो प्रचालन शामिल हैं और प्रचालन क्षेत्र में खतरों की पहचान और प्रबंधन करना ताकि विमान संचालन के लिए जोखिम न्यूनतम स्वीकार्य स्तर तक ही रहे ।
- सुरक्षित एप्रन के लिए प्रयास करना कि जहां यातायात में वृद्धि के बावजूद दुर्घटना और घटनाओं को कम से कम रखा जाए ।
- सुनिश्चित करना कि सभी विजुयल एड्स को स्थापित मानकों और प्रक्रियाओं के अनुसार बनाए रखा जाए।
- सभी उपयोगकर्ताओं को उनकी आवश्यकता के अनुसार सटीक एयरोनॉटिकल डेटा और सूचना प्रदान की जाए ।
- विमान को नुकसान पहुंचाने वाले किसी पक्षी एवं वन्य जीव से विमानक्षेत्र के आसपास के वातावरण को मुक्त बनाए रखना ।
- कुशल और प्रभावी तरीके से आपातकाल के दौरान खोज और बचाव समन्वय का संचालन किया जाना ।
- आपातकाल के दौरान कुशल विमानक्षेत्र अग्निशमन और बचाव प्रतिक्रिया प्रदान करना ।
- सुनिश्चित करना कि सभी कर्मचारियों को पर्याप्त और उचित पुनश्चर्या प्रशिक्षण द्वारा उनके सक्षमता स्तर को बनाए रखा जाए।

संजीव कुमार

(संजीव कुमार)
अध्यक्ष

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

SAFETY OBJECTIVES

Airports Authority of India shall:

- Ensure that Air Navigation Service is delivered in a manner where risk of any aircraft accident/incident is reduced to and maintained at or below as low as reasonably practicable irrespective of the volume of air traffic.
- Ensure that all navigational, communications and surveillance aids function as per design specifications and meet the required level of reliability and availability as defined by appropriate authority.
- Ensure that safety is maintained at appropriate level in airside operations, including cargo operations at all aerodromes and identify & manage hazards in the operational area to keep risks to aircraft operations at minimum acceptable level.
- Strive for safe apron operation where an accident and incidents are kept at minimum in spite of increase in traffic.
- Ensure that all visual aids are maintained as per established standards and procedures.
- Deliver accurate aeronautical data and information to all the users as and when they require.
- Maintain the environment around the aerodrome to keep it free from any birds and wildlife that may cause damage to the aircraft.
- Conduct search and rescue coordination during emergency in an efficient and effective manner.
- Provide an efficient Aerodrome Fire and Rescue response during emergencies.
- Ensure that the competency level of all employees is maintained by adequate and appropriate refresher training.

Sanjiv Kumar

(Sanjeev Kumar)
Chairman

Chapter – 1 Document Control

1.1 Introduction

This chapter describes Document Management system for all operational safety-related documents.

1.2 Document Management System

1.2.1. General procedures

Each Directorate shall implement a method of document management for operational safety-related documents which are prepared or distributed by Airports Authority of India. These documents shall be managed in a manner that ensures:

- The document is approved by the relevant authority before issuance;
- The document is reviewed periodically, updated and approved as necessary;
- Changes and the current status of documents are identified;
- Current versions of all applicable documents are available at their point of use;
- Documents remain legible and readily identifiable;
- Unintended use of obsolete and superseded documents is prevented, and suitable identification is applied to them if they are retained for any purpose;
- Appropriate document information is displayed on the document (e.g. version, date and document approval details) on the document;
- The master copy (electronic and physical version) must be kept in safe custody by the issuing directorate and the location of the local document shall be listed in the Station SMS Manual and made known and accessible to all concerned AAI personnel requiring access to controlled documentation in the execution of their duties;
- The documents developed by various directorates shall reflect appropriately that safety management system shall be applicable in their processes wherever required; and
- The relationship of the station level documents with those of other departments will be specified in the footnote of the hard copy and will be hyperlinked to the available sourced data in the soft copy version.

1.3 Documents of Aviation Safety Directorate

1.3.1 Corporate Safety Management System (C-SMS) Manual

Corporate Safety Management System (C-SMS) Manual is developed and maintained by Directorate of Aviation Safety, AAI CHQ.

1.3.1.1 Upkeep of the Manual

Directorate of Aviation Safety is responsible for the design, implementation, application, integrity and the ongoing updating of the Corporate Safety Management System Manual.

C-SMS manual shall be prepared by ED, Aviation safety, approved by Chairman AAI and accepted by DGCA.

Contents of the C-SMS manual follow the guidance provided by DGCA SSP circular 02/2018 and other applicable DGCA circular.

It is the responsibility of all AAI personnel to notify the Aviation Safety Directorate of any errors, omissions or problems encountered in applying the provision contained in the Corporate Safety Management System Manual (C-SMSM)

The errors, omissions or problems encountered should be addressed to:

Executive Director (Aviation Safety)
Airports Authority of India,
Rajiv Gandhi Bhawan, Block – A,
Safdarjung Airport New Delhi – 110 003
(E-mail-edas@aai.aero)

1.3.1.2 Review of the Manual

The Corporate Safety Management System (C-SMS) Manual (including all annexures/ forms) shall be reviewed **every three years**. The review period of **three** years will start from the effective date.

However, any changes at CHQ, before the review period shall be incorporated in SMS manual by the Accountable Executive, as per the procedure established in the document management system.

This review of the C-SMS manual shall be conducted by Aviation Safety Directorate and shall consider the following points:

- Status of the overall safety culture and safety achievements of the organization in the preceding years;
- DGCA amendments, new rules and observations be incorporated in the next version of the SMS Manual to achieve the aim of continuous improvement in Safety Management system.
- Feedback received in the preceding years concerning the Safety Management System;

- Assessment of Safety impact upon introduction of any changes in Air Navigation Services (ANS) and Aerodrome operations in the preceding years; and
- Arrange for a review of the Safety Management System (SMS) Manuals of all licensed Aerodromes, civil enclaves and ANS centers in coordination with their Safety Managers to identify:
  - any local safety issue in the SMS Manual that needs to be addressed;
  - any local deviation from the Corporate SMS Manual that is worthy of being incorporated into the Corporate SMS Manual;

1.3.2 Station Safety Management System (S-SMS) Manual:

All Licensed Aerodromes/ANS Centers / Civil Enclaves of AAI will mandatorily develop and maintain Station Safety Management System (S-SMS) Manual of Station.

Station Safety Management System Manual shall communicate the local safety procedures applicable at the station.

Contents of the S-SMS manual should follow the guidance provided by DGCA SSP circular 02/2018 and other applicable DGCA circulars.

Station Safety Management System manual shall be in coherence with Safety policy, objectives, procedures and practices prescribed in C- SMS manual, CHQ circulars or instructions issued from time to time. Any deviation from CHQ policy /procedures shall have prior approval of ED (Aviation safety).

S-SMS manual shall be prepared by Safety Manager, approved by Accountable Executive (APD/CIC/OIC) and endorsed by ED, Aviation safety.

The station Safety Management System (S-SMS) manual shall be reviewed **every three years.** The review period of three years will start from the effective date.

However, any changes at station level, before the review period shall be incorporated in SMS manual by the Accountable Executive of the Airport, as per the procedure established in the document management system.

All Station SMS Manuals shall be registered by Aviation Safety Directorate and a document number shall be generated. This shall be conveyed to the station in writing and a database of all registered safety documents shall be maintained in Aviation Safety Directorate, CHQ.

It is the responsibility of all AAI personnel to notify the Aviation Safety Directorate of any errors, omissions or problems encountered in applying the provision contained in the Station Safety Management System Manual (S-S-MSM).

It is preferable to report errors, omissions or problems encountered, to the concerned Safety Manager or Jt. GM/DGM (Aviation Safety) at Regional level in the first instance and if not satisfactorily addressed, then to:

Executive Director (Aviation Safety)
Airports Authority of India,
Rajiv Gandhi Bhawan, Block – A,
Safdarjung Airport New Delhi – 110 003
(E-mail-edas@aai.aero)

1.3.3 Aviation Safety Circulars

(a) Aviation Safety Circulars are issued under the signature of Chairman, AAI, containing information, guidance, directions and instructions on the following:

- Safety Management System Structure and Policy
- Directions to implement a Safety Plan/Policies
- Development of safety culture

(b) Aviation Safety Circulars are issued serially numbered annually. At the beginning of every year, a check list of current Aviation Safety Circulars shall be issued.

1.3.4 Aviation Safety Advisory Circulars

a) Aviation Safety Advisory Circulars are issued under the signature of Executive Director (Aviation Safety), containing recommendations, Safety awareness and Safety education material on the following:

- Reiteration of existing rules, standards, policies which are not being fully followed
- Case studies of accident/incidents
- Recommendations of Court of Inquiries
- General areas of weakness discovered during audit/investigation and recommendations thereon.
- Introduction of new /changes to existing SMS procedures /systems

b) Aviation Safety Advisory Circulars are issued serially numbered annually.

c) At the beginning of every year, a check list of current Aviation Safety Advisory Circulars shall be issued.

1.3.5 Newsletters and Safety Bulletins

Aviation Safety Directorate may also issue Newsletters and Safety Bulletins to highlight safety issues concerning our organization.

1.4 Document Owner Guidelines

A master electronic copy must be kept on a network directory by ED (Aviation Safety) for CHQ and Accountable executives at Airports/ Units, so that, if required, it is available to form the basis of the next version.

1.5 Distribution Control

Where documents are distributed electronically, printed documents must be clearly labelled as:

"UNCONTROLLED HARDCOPY. **The currency of this document must be checked against master index before use"**

The current version of C-SMS Manual, current Aviation safety Circulars, Aviation Safety Advisory Circulars and other relevant Safety documents are made available on AAI website www.aai.aero under link > Public Information >Public Documents as well as under link >Employee login>Circulars and Orders.

The current version of C-SMS Manual , current Aviation safety Circulars , Aviation Safety Advisory Circulars and other relevant Safety documents can also be accessed on "AIMS for Aviation Safety Module" .

A downloaded copy of Corporate SMS Manual from this portal shall be an uncontrolled copy and responsibility of its currency shall lie on the holder of that copy.

1.6 User Guidelines

- Users shall have access to all safety-related documents and indexes relevant to their activities;
- Users have the responsibility to ensure the currency of documentation before use;
- Where a document is distributed electronically, the electronic version becomes the approved version for use; and
- Once an electronic document has been printed it must be considered to be an uncontrolled document, as once printed it may become out of date.

Chapter – 2 SMS Regulatory Requirements

2.1 Introduction

This chapter provides information to comply with current SMS regulations and to provide guidance for the implementation of Safety Management System in Airports Authority of India in accordance with DGCA regulations.

2.2 Regulatory Requirements

2.2.1 ICAO Annex 19(Safety Management), 2nd edition, July 2016, specifies that "**The standards and Recommended practices contained in this Annex shall be applicable to safety management functions related to, or in direct support of, the safe operation of aircraft**".

Rule 29D of the Aircraft Rules, 1937 requires the service providers to implement a Safety Management System (SMS), which is acceptable to the State.

CAR Section 1 Series C Part I dated 24th March 2022, prescribes the detailed requirements for establishing Safety Management System (SMS) and its phased-wise implementation.

The above referred CAR is Applicable to organizations **"engaged in the operation of an aerodrome licensed under rule 78" and "An air traffic service provider"** along with other aviation organizations.

2.2.2 The above referred CAR vide para 2 specifies that, "Service provider shall develop, establish, maintain and adhere to a safety management system commensurate with the size and the complexity of its aviation products or services. The safety management system shall be established in accordance with the framework elements contained in this civil aviation requirements."

SMS framework shall incorporate four components and twelve key elements as described in para 3.2.3 chapter 3 of this manual.

2.2.3 Additionally, State Safety Programme, National Aviation Safety Plan, AD AC Circulars and SSP Circulars issued by DGCA are also as applicable w.r.t. SMS implementation.

2.3 Safety Management System in AAI

In compliance of the DGCA CAR Section 1 Series C Part I dated 24th March 2022 provisions, State Safety Programme, National Aviation Safety Plan, AD AC Circulars and SSP Circulars issued by DGCA (as applicable w.r.t. SMS), AAI has implemented SMS in the provision of Air Navigation Services and Airport Operations at all AAI Airports /ANS centres and Civil Enclaves.

In implementation of SMS in AAI, standards and recommended practices specified in Annex 19 and advisory / guidance material provided in ICAO Doc 9859 have been followed as applicable.

Along with compliance of the Safety Management system related requirements or standards, the provision of Air Navigation Services and Airport Operations at all AAI Airports /ANS centres and Civil Enclaves is conducted in accordance with ICAO standards and recommended practices, compliance of relevant DGCA CARs, Circulars and applicable National /local regulations.

2.4 Phase-wise Implementation of SMS

In compliance with the Annex 19, DGCA has developed Phase wise SMS implementation plan vide Civil Aviation Requirements (CAR) SECTION 1 – GENERAL SERIES 'C' PART I Issue III, 24th March 2022. Airport operator (AAI), ANSP are responsible for the Phase-wise implementation of a Safety Management System (SMS).

Chapter-3 Scope and Integration of the Safety Management System

3.1 Introduction

This chapter describes the scope and extent of AAI's aviation-related operations and facilities within which the SMS shall apply.

It deals with the scope of the processes, equipment and operations deemed eligible for the organization's Hazard Identification and Risk Management (HIRM) programme.

It also shows the functional chart of the organization. It describes the external interfaces and the environment in which the system operates.

3.2 Safety Management Fundamentals

3.2.1 Concept of Safety:-

Safety is "When operations are being managed safely so that risk are kept to acceptable level.
Safety is not absence of accidents but is tolerance of minor errors and right defenses in place.
Elimination of incidents and accidents may be unachievable but Controlled risk and controlled errors are acceptable in an inherently safe system.
In the context of Aviation Industry, as per ICAO Doc 9859 (Safety Management) 4th edition - Safety is "The state in which risks associated with aviation activities, related to, or in direct support of operation of aircraft, are reduced and controlled to an acceptable level"

3.2.2 Safety Management system: -

SMS is a system with safety as the goal. It is documented, process-based approach to safety with data driven decision making which seeks to proactively mitigate safety risks before they result in aviation accidents and incidents.

As per Doc 9859 – SMS is "A systemic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures."

Through the implementation of safety management system, the organizations can manage their safety activities in a more disciplined, integrative and focused manner. Possessing a clear understanding of its role and contribution to safe operations enables aviation industry, to prioritize safety risks and more effectively manage its resources for the optimal benefit of aviation safety.

As identified in Annex 19 — Safety Management, SMS is developed and maintained by service providers to continuously improve safety performance by identifying hazards, collecting and analyzing data, and continuously assessing and managing safety.

The ICAO Global Aviation Safety Plan (GASP, Doc 10004) objectives call for States to put in place robust and sustainable safety oversight systems and to progressively evolve these into a more sophisticated means of managing safety performance. These objectives align with ICAO's requirements for the implementation of State Safety Programs by States and SMSs by service providers.

3.2.3 Four components and twelve elements of Safety Management System

There are four components of an SMS system:

(I) **Safety Policy and Objectives**

A safety policy helps establish management's commitment to improving safety within the workplace. The policy defines specific practices, methods, processes and organizational structures necessary to achieve set safety goals.
It is composed of five elements: -

- Management commitment
- Safety accountabilities & responsibility
- Appointment of key safety personnel
- Coordination of emergency response planning
- SMS documentation

(II) **Safety Risk Management**

Safety risk management (SRM) includes hazard identification, safety risk management, safety risk mitigation and risk acceptance.

It is composed of two elements :-

- Hazard identification
- Risk assessment and mitigation

(III) **Safety Assurance**

Safety assurance (SA) evaluates the effectiveness of the risk control strategies a organization has implemented to mitigate identified potential hazards. The SA helps organizations feel confident that they are meeting or exceeding their safety goals and requirements.

Safety assurance provides valuable insight and analysis to help businesses improve their safety systems to minimize risk.

It is composed of three elements:-

- Safety performance monitoring & measurement
- The management of change
- Continuous improvement of the SMS.

(IV) **Safety Promotion**

Safety promotion focuses on creating a positive safety culture in the workplace by implementing training, communication and other actions.

Safety promotion helps advocate for a safer workplace, provides training and improves organizational communication.

It is composed of two elements: -

- Training & education
- Safety communication

3.3. Scope and extent of SMS in AAI

3.3.1. In accordance with ICAO Annex 19 (Safety Management) principles, “Annex shall be applicable to safety management functions related to, or in direct support of, the safe operation of aircraft.”

3.3.2. The SMS is applicable in AAI, in the following domains: -

a) Provision of Air Traffic Services in the Indian Airspace including the overseas airspace delegated to India
b) Design, Development, Operation and Maintenance of International / domestic airports and civil enclaves;
c) Control and Management of Indian airspace including overseas Airspace delegated by ICAO;
d) Design and Development of air routes, Instrument Approach Procedures and designation of controlled air space;
e) Development and maintenance of operational area viz. Runways, Aprons, Taxiways etc. and Management of Airside Operations;
f) Construction, Modification and Management of passenger terminals as far as it affects the safety of aircraft operations;
g) Development and Management of cargo terminals at International and domestic airports as far as it affects the safety of aircraft operations;
h) Provision of visual aids at aerodromes;
i) Provision of Communication, Navigation, Surveillance and Air Traffic Automation facilities viz. VHF, VCCS, ILS, DVOR, DME, RADAR, ATS Automation etc. to facilitate Air Navigation Services;
j) Flight operations in relation with calibration of CNS facilities.
k) Provision of Aeronautical Information System including maps and charts;

l) Provision of Aeronautical Surveys;
m) Provision of Search and Rescue Coordination services

Note: Metrological information services to ATS is provided by Indian Metrological Department. IMD is responsible for implementation of SMS in provision of metrological information services.

3.3.3. All directorates/departments, workshops, units and facilities of the AAI which are providing any of the services mentioned in Para 3.3.2. are required to implement the SMS in their domains as applicable.

3.3.4. Applicability of SMS at airports/ ANS centers and Civil Enclaves shall be as per the services being provided by AAI at concerned station. The S-SMS manual shall clearly specify the list of services where SMS is applicable.

3.4 SMS of internal and external interfaces: -

3.4.1. Some of the internal and external interfaces can impact safety through their activities / decisions. Agreements and contracts with external organizations may not necessarily address safety.

Such interfaces have to be identified and considered for their relative criticality and their potential safety risks. Aspects to be considered are:

a) What is being provided;
b) Why it is needed;
c) Whether the organizations involved has an SMS or another management system in place; and
d) Whether the interface involves the sharing of safety data / information.

3.4.2 Assessing the safety impact of interfaces:

All safety issues or safety risks related to the interfaces should be documented and made accessible to each organization for sharing and review.

The coordination between the organizations involved in the interface should include:

a) Clarification of each organization's roles and responsibilities;
b) Agreement of decision on the actions to be taken (e.g. Safety risk control actions and timescales);

3.4.3 All airports, ATS Centers and Civil enclave shall identify the internal and external interfaces including contracted services which may have safety implications on aircraft operation. LOA/SOP shall be developed to define roles, responsibilities and procedures to be followed by the concerned organization/units to address the safety implications.

Concerned HOD's shall be responsible to identify the interfaces affecting the safety of services , develop the LOA/SOP as required .The SOP/LOA should be accepted by concerned HOD and authorized person of external service provider and approved by accountable executive.

3.5. Meteorological Interface Management

3.5.1. Being, the national meteorological service provider (as designated in DGCA CAR Section-9 Series-M Part 1, Section-8 Series-C Part 1), the responsibility of rendering Aeronautical MET Services to AAI vests with India Meteorological Department (IMD).

For this purpose, an institutional arrangement by way of a Memorandum of Understanding (MoU) was signed on 17.7.2006. In addition to it, a Letter of Agreement (LoA) dated 15.11.2007 between AAI and IMD which defines the role and responsibility of both the organizations. As per further addendum to the LoA dated 1.10.2015 defines the calibration of Airport meteorological instrumentation.

The MET service provider for international air navigation, IMD is governed by and adheres to the relevant provisions of following regulatory documents:

DGCA CAR: Section-9 Series-M Part 1, Section-8 Series-C Part 1
SARPs contained under ICAO Annex 3, Annex 11, Annex 14
ICAO Doc: 4444, 8896, 9157, 9837 and 9377
WMO Doc: 49, 1001 and 1083
In addition, IMD has its own Standard Operating Procedures (SOPs) by means of a Manual on Meteorological Services for Aviation in India, the latest edition being 2012, which also provides similar information contained in ICAO Annex 3 with slight changes as applicable to agree upon Regional practices and requirements. IMD also follows WMO guidelines on instrument, observation, reporting and forecasting procedures.

The Central Aviation Meteorology Division (CAMD), which is the specialized division within IMD for supervision of aeronautical Met services, is ISO 9001:2008 (QMS) certified and all the four MET Watch Offices (MWO) functioning at Chennai, Delhi, Kolkata and Mumbai for the effective and efficient conduct of domestic and international flights from / to Chennai, Delhi, Kolkata and Mumbai FIR are also ISO 9001:2008 (QMS) certified.

3.5.2. In order to ensure that those aspects of MET services which have got direct implication on aviation safety, IMD ensures safety in the following aspects:

➢ **Observational Safety**

- Taking routine current weather observations to meet the requirements of air traffic services units as per LoA with AAI;
- Reporting observed meteorological information and disseminating as per schedule prescribed in Annex 3 of ICAO and as per LoA with AAI;
- Issuing appropriate warning as per procedure laid down in Annex 3 of ICAO and as per LoA with AAI.

➢ **Instrumental Safety**

- Design, Sitting, Calibration and Traceability

➢ **Personnel Safety**

- Education, Training and Competency

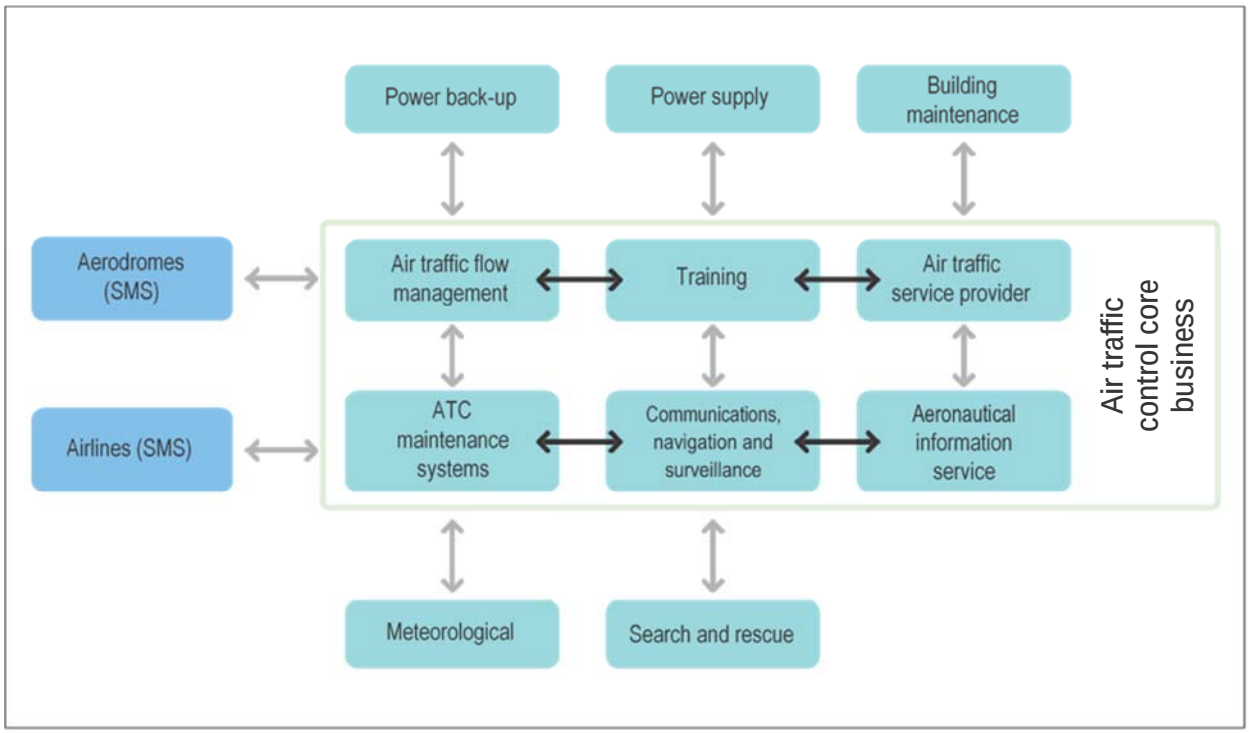
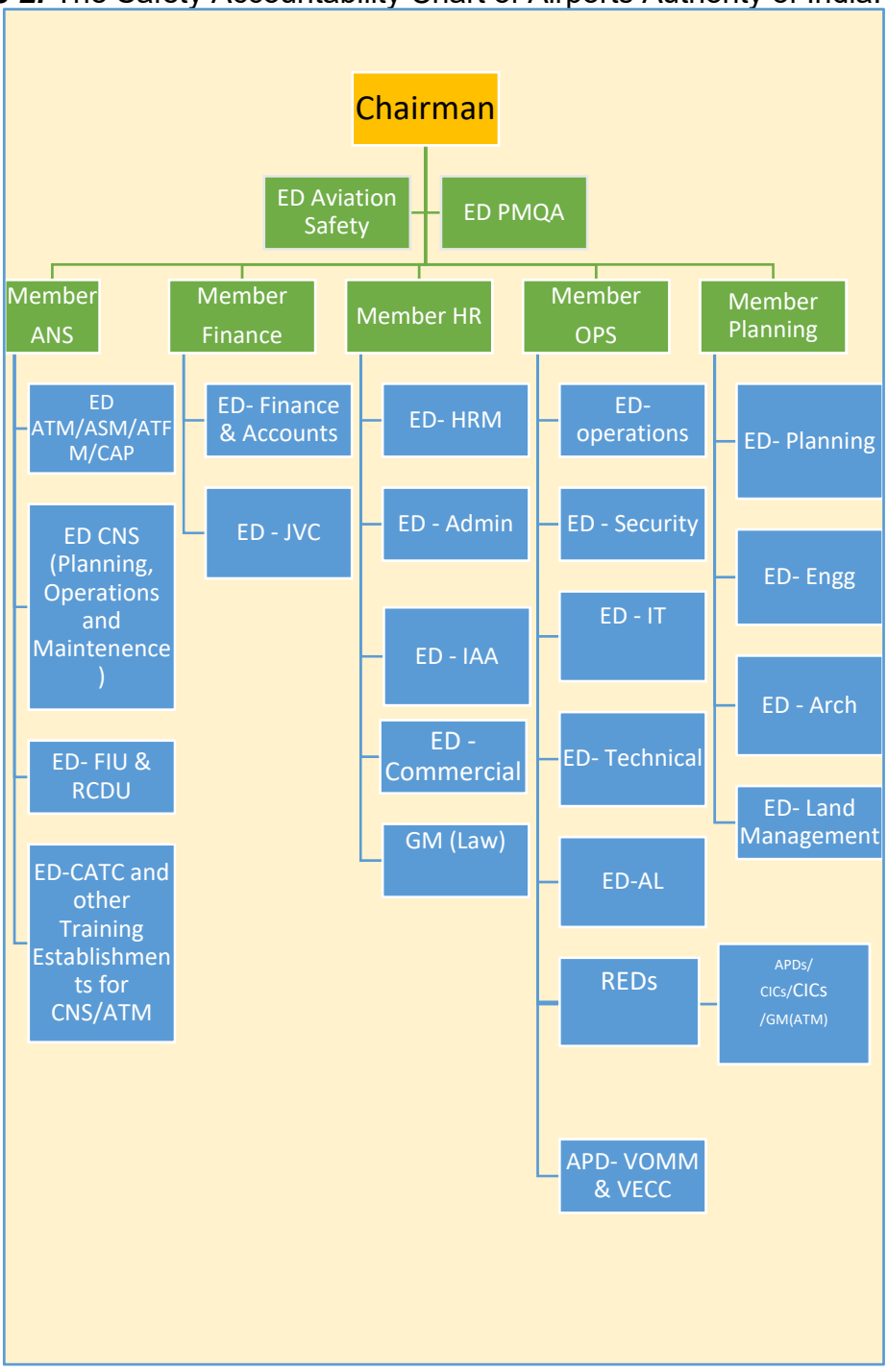


Figure 3-1 Example of Air Traffic Service provider SMS interfaces

Figure 3-2. The Safety Accountability Chart of Airports Authority of India:



3.6. Integration of SMS with other control / Management system:

Wherever applicable, the Safety Management system is integrated with the application of any other control/management system such as QMS, OSHE etc.

3.7. Functions of AAI

Airports Authority of India is a Mini Ratna Public Sector Undertaking under the Ministry of Civil Aviation. It was formed by an Act of Parliament and came into existence on 1st of April, 1995.

Airports Authority of India is entrusted with the responsibility of creating, upgrading, maintaining and managing civil aviation infrastructure both on ground and airspace in the country. The top management of Airports Authority of India consists of Chairman and five Whole Time Board Members.

AAI manages 110 Airports, which include 23 International airports, and 12 Customs airports and 75 domestic Airports. Out of 110 Airports , there are 28 Civil Enclaves at Defense airfields . Administration and operation of these airports is divided into five Regions i.e. North, West, East, South and North-East. Each Region is headed by a Regional Executive Director.

AAI in its endeavor to create capacity, takes up projects of construction, modification, maintenance of passenger & cargo terminals including passenger facilities and related amenities at its terminals and extension / strengthening of Operational infrastructures like Runways, Taxiways, Apron, etc. thereby ensuring safe and secure operations of aircraft, passenger and cargo in the country.

AAI provides Air Navigation Services in air space measuring over 2.8 million square nautical miles which cover entire Indian airspace. Air Navigation Services includes provision of Air Traffic services and installation/maintenance of Communication systems such as VHF TX/RX, HF TX/RX, VCCS and DVTR including navigational and surveillance aids viz. DVOR, DME, ILS, ATC radars, visual aids, etc. The airspace under the jurisdiction of AAI has been divided into five FIR's.

AAI is also responsible for providing Air Navigation Services at Green Field Airports, developed and operated by Private Operators and limited Navigation Services at Defence Airfields used for public transport, in India.

In tune with the global approach to modernization of Air Navigation infrastructure, AAI is striving towards its plan for transition to satellite based Communication, Navigation, Surveillance and Air Traffic Management, phased implementation of

Performance Based Navigation (PBN) etc. AAI has also undertaken GAGAN project in technical collaboration with ISRO, where satellite-based system will be used for navigation.

All major air-routes over Indian landmass are Radar covered (Radar installations), Ground and space-based ADS-B coverage, ASMGCS along with VOR/DVOR coverage, NDB installations and Distance Measuring Equipment (DME). Runways are provided with ILS (Cat-I/II/III) installations with Night landing facilities at most of the airports. Majority of ATS centers are equipped with modern ATS Automation System.

AAI provides Air Navigation Services and Airport Operations through a network of Communication, Navigation and Surveillance facilities throughout the country, by dedicated and appropriately trained and competent personnel, by following processes and procedures, as per the guidelines contained in National and International regulations on civil aviation.

AAI imparts basic induction level as well as professional skill upgradation training through its own dedicated 06 training institutions, i.e. Civil Aviation Training College Allahabad, Training center Hyderabad, NIATAM Gondia, Indian Aviation Academy and two dedicated institutes for training of fire personnel i.e. Fire Service Training School at Kolkata and Fire Training Centre at New Delhi.

AAI has technical collaboration with a number of National & International organizations, thereby regularly interacts with number of organizations, like ISRO, ICAO, FAA, Air Services Australia, NATS, CAAS, Aero Thai, and European Union on civil aviation matters and to improve safety levels. AAI is also a member of global bodies, i.e. ACI (Airport Council International) and CANSO (Civil Air Navigation Services Organization). We are founding Member & partner ANSP of Indian Ocean Strategic Partnership to Reduce Emissions (INSPIRE) Group in CANSO.

AAI maintains coordination with Defense authorities for its civil aircraft operations at defense airfields, flexible use of airspace and for Search & Rescue purposes.

Some of the non-core activities like maintenance, housekeeping etc. are outsourced to external agencies by following the due processes and ensuring that the safety is not compromised.

Chapter-4 Safety Policy

4.1 Introduction

This Chapter lays down the Corporate Safety Policy of AAI, which has been signed by the Accountable Executive of AAI (Chairman, AAI). It shows the commitment of top management of AAI towards the goal of ensuring safety in all its core activities.

4.1.1. Airports Authority of India has defined its Corporate Safety Policy including a clear statement about the provision of necessary resources for its implementation.

4.1.2. The Corporate Safety Policy has been developed and endorsed by senior management, in consultation with Key safety personnel where appropriate.

4.1.3. The Safety Policy and Objectives of AAI shall also be reflected in the station level SMS Manual of all AAI Airports.

4.1.4. Safety Policy shall be visibly endorsed at all AAI airports and ANS units. It shall be communicated to all AAI employees.

4.1.5. The station may define Station Safety policy of AAI controlled airports which shall be derived from Corporate safety policy considering local aspects.

4.1.6. The Safety Policy and Objectives are reviewed along with the Manual by the directorate of aviation safety and draft is put up for comments to all the concerned directorates. Based on the comments/suggestions from various directorates, the revised draft is submitted for approval by the Chairman.

4.1.7 The Safety Policy of AAI has been reviewed following the document review policy and has been approved/signed by Chairman, AAI who is the Accountable Executive of AAI.

4.2 Corporate Safety Policy

We, in Airports Authority regard safety as one of our core business functions. We are committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure highest reasonable standard of safety within our organization.

All our employees without any exception are accountable and responsible for safety while delivering our service.

Our commitment is to:

1) Comply with and wherever possible exceed international and national standards, regulations & requirements and adopt best industry practices on safety.
2) Provide appropriate resources both human and financial necessary to support the implementation & management of safety.
3) Define, document and communicate throughout the organization the safety accountabilities, responsibilities and authorities of all its employees including all members of management.
4) Ensure that all our employees are adequately & appropriately trained for their roles & responsibilities, are competent in safety matters and continue to remain so, and are allocated only tasks commensurate with their skills.
5) Foster positive safety culture in which our employees are encouraged to report their safety concerns or errors without the fear of any punitive action. However, an act of gross negligence or deliberate or willful disregard of safety rules and regulations shall be subject to disciplinary action.
6) Establish & Operate a comprehensive procedure for reporting, collection, analyzing and storing of data on Hazards, incidents and accidents to achieve continuous improvement in our safety performance.
7) Continuously improve our safety performance through regular monitoring and measurement of realistic safety performance indicators and safety performance targets.
8) Ensure that the facilities, equipment and services provided by external suppliers or contractors meet the safety performance standards and requirements of our organization.
9) Share safety information generated by our internal reporting mechanism with all stake holders to improve aviation safety.
10) Review periodically efficacy of our set Safety Performance Indicators & Targets, Safety Management System, and Safety Policy to enable our Organization to adapt to changing safety environment.

Chapter-5 Safety Objectives

5.1 Introduction

This Chapter lays down the Corporate Safety Objectives of AAI.

It shows the commitment of the top management of AAI towards the goal of ensuring safety in all its core activities. The Safety Objectives are derived from AAI Safety Policy and linked to Safety Performance Indicators (SPIs).

Safety objectives are brief, high-level statements of safety achievements or desired outcomes to be accomplished.

Safety objectives provide direction to the organization's activities and are consistent with the safety policy that sets out the organization's high-level safety commitment.

They are also useful to communicate safety priorities to personnel and the aviation community as a whole. Establishing safety objectives provides strategic direction for the safety performance management process and provides a sound basis for safety related decision-making.

AAI encourages and make sure that its Directorates engaged in providing, supporting or engaging personnel, establishments on contract for aviation-related business shall have Safety Performance Indicators, Safety Performance Targets and Action Plans supporting the overall safety objectives set by AAI.

AAI develops Safety Action Plans to achieve the Safety Performance Targets.

The Safety Objectives of AAI shall be reiterated in the Safety Management Manual of all AAI-owned aerodromes and/or ANS Centres along with the plans to achieve them. The Safety Objectives of AAI managed airports may be established in the Station SMS manual based on local safety issues in addition to the Safety objectives of AAI.

The Safety Objectives of AAI have been reviewed by following the document review policy and have been approved/signed by The Chairman, AAI, who is the Accountable Executive of AAI.

5.2 Safety Objectives

Airports Authority of India shall:

a) Ensure that Air Navigation Service is delivered in a manner where risk of any aircraft accident/incident is reduced to and maintained at or below as low as reasonably practicable irrespective of the volume of air traffic.

b) Ensure that all navigational, communications, surveillance and ATS automation facilities function as per design specifications and meet the required level of reliability and availability as defined by appropriate authority.

c) Ensure that safety is maintained at appropriate level in airside operations, including cargo operations at all aerodromes and identify & manage hazards in the operational area to keep risks to aircraft operations at minimum acceptable level.

d) Strive for safe apron operation where an accident and incidents are kept at minimum in spite of increase in traffic.

e) Ensure that all visual aids are maintained as per established standards and procedures.

f) Deliver accurate aeronautical data and information to all the users as and when they require.

g) Maintain the environment around the aerodrome to keep it free from any birds and wildlife that may cause damage to the aircraft.

h) Conduct search and rescue coordination during emergency in an efficient and effective manner.

i) Provide an efficient Aerodrome Fire and Rescue response during emergencies.

j) Ensure that the competency level of all employees is maintained by adequate and appropriate refresher training.

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Chapter-6

Role, Safety Accountability and Responsibility of Personnel Involved in SMS

6.1 Introduction

This chapter defines and document the safety accountabilities, responsibilities and authorities of all whole-time board members of management as well as of all employees of AAI.
This chapter also describes the constitution and functions of various Safety Committees at CHQ and field stations.

- **The Chairman, AAI is the Accountable Executive for AAI.**
- **ED (Aviation Safety) is designated as Safety Manager of the organization** and is the responsible for development, implementation and maintenance of SMS in AAI. ED(AVS) is the nodal person to interact within AAI and with all other external agencies on safety aspects.
- Airports Authority of India has identified the safety accountabilities, responsibilities and authorities of its employees including top management
- Specific safety accountabilities of whole-time members of management have been defined and their role in relation to the SMS reflects how they can contribute towards a positive safety culture.
- Safety accountabilities, responsibilities and authorities of management of AAI Aerodromes/Locations shall be documented in their Station SMS manuals;
- In some cases, specific safety responsibilities shall be documented for executive positions, while in other more generic responsibilities shall be documented for operational personnel;
- Safety Committees have been established at Corporate, Regional and Airport/Location level. The constitution and terms of reference of the Safety Committees at each level are documented.

6.2 Safety Accountability, Safety Responsibility and Authority of AAI personnel

6.2.1 Chairman, AAI

Safety Accountability-

The Chairman, AAI, is accountable to Government of India, for the Safe Management of Airports operated by AAI , Air navigation services within AAI administered airspace and Flight operations related to Nav Aids calibration.

Safety Responsibility-

In discharging this accountability, the Chairman is responsible for-

Accepting a leadership role to ensure commitment throughout the organization, particularly at senior management level, to regard safety as highest consideration and for the implementation of Safety Management System;

Ensuring provision of services for effecting obligations under the Chicago convention towards safe air-navigation services and airport operations;

Approving a safety management policy that indicates AAI safety objectives and commitment to safety,

Ensuring the provision of Manpower, resources and facilities to facilitate safe operation of Aircrafts at Airports and safe navigation of Aircrafts.

Ensuring that Safety Management System and operational performance of AAI are evaluated regularly for effectiveness on defined parameters which are updated timely.

Authority-

As per delegation of Powers,
Final authority over operations (ANS and Aerodrome).

6.2.2 Member (ANS)

Safety Accountability

- Member (ANS), AAI, is accountable to the Chairman of AAI for the safe management of Air Navigation Services within AAI administered Airspace and safety of flight operations related to calibration of Nav-Aids.

Safety Responsibility

Member (ANS) is responsible for;

- Assuming a leadership role to ensure commitment to the safety management policy intent, and safety management system requirements, through the Air Navigation Services;
- Ensuring planning and management of airspace delegated to India and of provision of Air Traffic Services for smooth air traffic operations;

- Ensuring that Air Navigation personnel (CNS and ATM) are aware of and held accountable for their safety performance;
- Ensuring the provision of Air Navigation Services in accordance with the ICAO SARPS and National Regulations;
- Ensuring the planning, procurement, installation, maintenance and operations of ANS infrastructure to facilitate the safe aircraft operations at all AAI airports and other airports wherever such services are delegated to AAI;
- Ensuring planning, provisioning and safe operation of logistic support to air traffic operations. Procurement of equipment related to provision of ATM, Navigational and Surveillance services and integration of the same in the airspace controlled by AAI;
- Ensuring planning, recruitment and training of manpower for the provision of safe ANS Services;
- Ensuring that effective liaising and coordination is conducted between AAI and Defence, Telecommunication, Meteorology department and State authorities relating to safe civil air traffic operations;
- Ensuring that effective liaising and interaction is conducted with various agencies connected with Air Traffic Control Services, Air Navigation, Air Transport Operations and related areas e.g. ICAO, European Union, FAA, CANSO, ITU, IATA, IFALPA, etc. and other Air Navigation Service providers;
- Organization and operation of Aeronautical Information Services including maps and charts;
- Planning, management and operation of Flight Inspection Unit;
- Management of Civil Aviation Training College and other associated training establishments; and
- Ensuring introduction and spread of information technology to improve the safety level in ANS functions.

Authority : As per delegation of power

6.2.3 Member (Operations)

Safety Accountability

Member (Operations) is accountable to the Chairman, AAI, for the safe management of Airports and Civil Enclaves operated by AAI, including Corporate Planning & Management Service.

Safety Responsibility

In discharging this accountability, Member (Operations) is responsible for:

- Accepting a leadership role to ensure commitment, to the safety management policy intent and safety management system requirements in respect of airport operations and Airport Rescue and Firefighting (ARFF);
- Ensuring upkeep and maintenance of infrastructure at airside including airport ground lighting services, terminal building and city side;
- Ensuring that all operational personnel are aware of and held accountable for their safety performance throughout the airport management;

- Ensuring adherence to ICAO SARPS and National Regulations in airport management;
- Ensuring planning, provision, maintenance and operation of infrastructure and equipment for safety, fire and rescue services including vehicles for operational activities at the airports;
- Management of Fire Training Institutes;
- Airport capacity assessment, slot allocation, airside management including apron control;
- Ensuring control of obstacles in and around AAI-owned aerodromes;
- Ground handling, cargo activities and security arrangements at AAI-owned aerodromes;
- Ensuring effective interaction and liaison with State Authorities, Law and Order agencies, Airlines, Operators and agencies dealing with cargo operation;
- Ensuring that effective interaction and liaison is conducted with various agencies connected with air transport operations and related areas including ICAO, ACI, etc. and other agencies; and
- Ensuring introduction and spread of information technology to improve the safety level in AAI.

Authority: As per delegation of power

6.2.4 Member (Planning)

Safety Accountability

Member (Planning) is accountable to The Chairman, AAI, for the safety management of services provided both internally and externally by the Planning & Engineering Division of Airports Authority of India; including the following Departments:

I. Aerodrome Planning & Engineering Works

Safety Responsibility

In discharging this accountability, Member (Planning) is responsible for;

- Accepting a leadership role to ensure commitment to the safety management policy intent and safety management system requirements throughout the Planning & Engineering Division;
- Ensuring that in exercising its powers and performing its functions, the Planning Division of AAI regards the safety of air navigation and airports as the most important consideration;
- Ensuring that Planning & Engineering Division managers and personnel are aware of and held accountable for their safety responsibilities and performance by establishing, monitoring and improving safety indicator performance in the concerned departments;
- Ensuring the Airport Services Planning & Engineering functions are conducted by following the relevant government, industry and international standards and regulations;

- Establishing the appropriate controls over project activities to ensure that the safety of air navigation of aircraft within Indian-administered airspace and at aerodromes for which AAI is responsible, is not compromised by changes to the system;
- Ensuring the provision of adequately trained and competent manpower within the Planning & Engineering Division to ensure that planning and project activities do not compromise the delivery of a safe ATS and Airports Service by the service delivery units (Process owner) by devising suitable quality control measures in tune with ICAO annexures on relevant services; and
- Ensuring that effective liaison is conducted between the Planning & Engineering Division and other AAI Units, and relevant external organizations, to ensure that the safety aspects for change are fully considered before a change is implemented.

Authority: As per delegation of power

6.2.5 Member (Finance)

Safety Accountability

Member (Finance) is accountable to The Chairman, AAI, for the safe and effective management of the financial resources allocation to maintain/enhance safety for airport operations and ANS services. Analyzing the financial results of all operations and making necessary recommendations for future operations.

Safety Responsibility

In discharging this accountability, Member (Finance) is responsible for:

- Ensuring that in exercising its powers and performing its functions, the Finance Division of AAI regards safety of air navigation as the most important consideration;
- Accepting leadership role to ensure commitment to the safety management policy intent and safety management system requirements throughout the Finance Division;
- Ensuring that Finance Division mangers and personnel are aware of and held accountable for their safety responsibilities and performance;
- Ensuring that the provision of Air Traffic and Airport financial functions are conducted in accordance with the relevant government, industry and international standards and regulations;
- Establishing appropriate controls over financial activities to ensure the safety of air navigation of aircraft within AAI controlled airspace and at aerodromes which AAI is responsible, is not compromised by changes to the financial system;
- Ensuring the provision of adequately trained and competent manpower within the Finance Division to ensure that financial activities do not compromise the delivery of a safe ANS and Airport Service by the service delivery Units; and
- Ensuring that effective liaison is conducted between the Finance Division and other AAI units, and relevant external organizations, to ensure that the safety aspects for any change involving the Finance Division are fully considered before the change is implemented.

Authority: As per delegation of power

6.2.6 Member (Human Resource)

Safety Accountability

Member (HR) is accountable to The Chairman, AAI, for the safe and effective design, development and delivery of innovative and effective human resource policies.

Safety Responsibility

In discharging this accountability, Member (HR) is responsible for:

- Assuming a leadership role to ensure commitment throughout the Human Resources Division to the safety management policy and safety management system requirements by ensuring recruitment of trained and adequate manpower to the departments directly responsible for the safety of ANS services and Airport Operations;
- Ensuring that in exercising its powers and performing its functions, the Human Resources Division areas of AAI regards the safety of air navigation as the most important consideration;
- Ensuring that Human Resources Division managers and personnel are aware of and held accountable for their safety performance;
- Ensuring the provision of Human Resource functions within ATS and Airport management are conducted in accordance with the relevant government, industry and international standards and regulations; and
- Ensuring effective liaison is conducted between the Human Resources Division and other AAI units, and relevant external organizations, to ensure that the safety aspects for any change involving the Human Resources Division are fully considered before the change is implemented.

Authority: As per delegation of power

6.2.7 Executive Director (Aviation Safety)

Safety Accountability

Executive Director (Aviation Safety) is the Safety Manager of AAI and is accountable to Chairman, AAI for:

- Providing advice and assurance to the Chairman and Whole-time board members of AAI relating to safety issues and performance; internal, external and international safety initiatives and requirements;
- Establishing Safety Management System in AAI,
- Establishing safety standards;
- Establishing a system for safety management education and safety awareness;
- Promoting Safety culture in AAI, monitor & support similar activity conducted by service delivery directorates;
- Establishing a safety audit and surveillance system;
- Effective interface with the Director General of Civil Aviation and industry liaison on safety matters; and

- Establishing effective safety relations with international bodies and ICAO coordination.

Being safety manager of AAI, ED AVS advises the Chairman AAI (Accountable Executive) and other executives on safety management matters, and is responsible for coordinating and communicating safety issues within the organization as well as with external members of the aviation community.

Functions of the safety manager include, but are not limited to:

a) Manage the SMS implementation plan (upon initial implementation);
b) Monitor corrective actions and evaluate their results;
c) Provide periodic reports on the organization's safety performance;
d) Maintain SMS documentation and records;
e) Provide independent advice on safety matters;
f) Monitor safety concerns in the aviation industry and their perceived impact on the organization's operations
g) Implementation of SDCPS across the operating directorate and data sharing with DGCA.

Safety Responsibilities

ED (Aviation Safety) is responsible for:

- Developing and maintaining a Safety Policy of AAI;
- Establishing and maintaining a Corporate Safety Management System including arrangements for identifying, reporting, tracking and correcting safety issues and for the initiation of preventive action where necessary;
- Undertaking safety audits of all operational units and their controlling offices related to safety management, at interval of 2 years but not exceeding 3 years;
- Review of the Corporate Safety Management System to evaluate its effectiveness and ensuring that improvements are made where required;
- Overseeing the performance of AAI's safety management activities and providing advice on potential improvements to safety performance;
- Reviewing and reporting on compliance with safety management policies, plans, systems and procedures and regulatory arrangements and standards; ensuring safety issues are reported in a timely manner to the Accountable Executive and Whole-time board members;
- Designing, developing and managing an effective audit program directed toward the highest risk exposures to the safe operation of the airports and Air Navigation Services;
- Designing, developing and managing an effective safety surveillance program;
- Ensuring that Directorate of Aviation Safety personnel are trained, qualified and competent to discharge their safety related obligations;
- Developing and promoting safety management training across AAI; and
- Review of the interface between AAI, the regulator (DGCA), and other aviation organisations in the matter of Safety.

Authorities

The Executive Director (Aviation Safety)

- Reports directly to the Chairman, AAI on all safety related matters;

Is authorised, under the direction of Chairman, AAI, to conduct safety audits, surveys and inspections of any aspect of the operations; and has the authority to conduct investigation on internal safety events, in accordance with the procedures prescribed in the manual.

6.2.8 All Executive Directors at CHQ

Safety Accountabilities

Executive Directors are accountable to concerned Members to provide services and facilities, for customers and stakeholders, in accordance with the Chicago Convention and National Aviation legislations on safety issues related to their respective domain in AAI.

Safety Responsibilities

In discharging their accountabilities, the Executive Directors are responsible in their respective domain for:

a) Ensuring that safety considerations are given foremost priority;
b) Ensuring the application of the safety management policy and procedures in accordance with AAI's Safety Management System.
c) Ensuring mitigation of hazards and acceptance of residual risks, following the procedures contained in AAI's Corporate Safety Management System Manual and their directorates relevant manuals/ procedures etc.;
d) Overseeing the safety and operational performance of their Directorates, formulate and issue policy and procedures pertaining to it,
e) Ensuring collection and reporting of safety issues and safety data on time to the Directorate of Aviation Safety and the AAI Board, whenever required to do so;
f) Ensuring that all their Directorate executives and personnel are aware of, and held accountable for, their safety performance;
g) Coordination with concerned external authorities such as Defence authorities /ICAO/DGCA/ State Govt./ PSUs etc. for ensuring safety of flight operations
h) Ensuring Planning, Procurement, installation & commissioning of infrastructure projects, Facilities, CNS aids, equipment, automation systems, tools and services related with Safety of Aircraft operations,
i) Planning and ensuring that all executives and personnel of their directorates are trained, qualified and competent to discharge their safety related obligations;
j) Ensuring that necessary safety assessments, have been carried out and accepted by the competent authority, in relation to the development of all plans, policies, procedures, processes and systems that affect airport operations and Air Navigation Services.
k) Ensuring that management of human resources is appropriate to facilitate safe aircraft operations;

l) Ensuring that the prior approval from DGCA is obtained by their directorate for all projects / services affecting aircraft safety, as required by Rule 83(2) of Aircraft Rules, 1937 and DGCA CAR.

m) Ensuring that revenue raised by AAI is sufficient and advise senior management on corporate financial management strategies to maintain safe operation of ANS and Airport operations

n) Implementation of government policies; industrial relations; and control, discipline and appeal of employees in relation with the aviation safety;

6.2.9 Regional Executive Director (RED)

Safety Accountability

Regional Executive Director (RED) is accountable to Member (Operations) for the effective management of SMS for airport operations and to Member (ANS) for ANS services within the Region.

Safety Responsibilities

In discharging these accountabilities, RED is responsible for:

a) Ensuring that safety considerations are given foremost priority;
b) Ensuring the application of the safety management policy and procedures in accordance with AAI's Safety Management System.
c) Ensuring mitigation of hazards and acceptance of residual risks, following the procedures contained in AAI's Corporate Safety Management System Manual and their directorates relevant manuals/ procedures etc.;
d) Overseeing the safety and operational performance of the region, formulate and issue policy and procedures pertaining to it,
e) Ensuring collection and reporting of safety issues and safety data on time to the Directorate of Aviation Safety and the AAI Board, whenever required to do so;
f) Ensuring that all the executives and personnel in the region are aware of, and held accountable for, their safety performance;
g) Coordination with concerned external authorities such as Defence authorities /ICAO/DGCA/ State Govt./ PSUs etc. for ensuring safety of flight operations
h) Ensuring Planning, Procurement, installation & commissioning of infrastructure projects , Facilities, CNS aids, equipment, automation systems, tools and services related with Safety of Aircraft operations,
i) Planning and ensuring that all executives and personnel of their region are trained, qualified and competent to discharge their safety related obligations;
j) Ensuring that management of human resources is appropriate to facilitate safe aircraft operations;
k) Ensuring that the prior approval from DGCA is obtained by the airports/ ANS centers in their region for all projects / services affecting aircraft safety, as required by Rule 83(2) of Aircraft Rules, 1937 and DGCA CAR.
l) Ensuring that revenue raised by their airports/ANS centers is sufficient to maintain safe operation of ANS and Airport operations

m) Implementation of government policies; industrial relations; and control, discipline and appeal of employees in relation with the aviation safety;

Authority: As per delegation of power

6.2.10 Airport Director/CIC/ OIC/GM(ATM)/GM(CNS)

Safety Accountability

The Airport Director/CIC/OIC, as applicable, is an Accountable Executive of the concerned Airport/Civil Enclave / ANS Center and is accountable to Member (Operations) for Airport operations and Member (ANS) for ANS through REDs.

Note 1: APDs at Kolkata and Chennai are accountable Executives for Airport Operations only and directly accountable to Member (Ops).

Note 2: Senior most among GM(ATM) & GM(CNS) at Delhi , Mumbai , Kolkata and Chennai shall be accountable executive for ANS at Delhi, Mumbai , Kolkata and Chennai respectively and are accountable to Member (ANS) through REDs.

Safety Responsibilities

In discharging their accountabilities, the Airport Director/CIC/ OIC and GM(ATM) are responsible for:-

a) Ensuring that safety considerations are given the foremost priority;
b) Taking a leadership role in safety programmers and ensuring that safety is never compromised;
c) Effective implementation of S-SMS within the area of responsibility;
d) Compliance with all safety related regulation and standards applicable to, Air Navigation services and Airport operations;
e) Management of immediate response to an airport emergency
f) Ensure that all the Safety assessments for the project/services are carried out as per the SMS guidelines, in a timely manner to avoid delay in commissioning.
g) Risk acceptance and mitigation of any hazards that are identified within the system, in accordance with the procedures contained S-SMS
h) Overseeing the safety and operational performance in accordance with ICAO, SARPS, DGCA , ICAO and State rules and requirements;
i) Ensuring collection and reporting of safety data and safety issues in a timely manner in AIMS and to the Directorate of Aviation Safety, whenever required;
j) Ensuring that all airport executives and personnel are aware of, and held accountable and responsible for their safety performance;
k) Ensuring that all airport executives and personnel are trained, qualified and competent to discharge their safety related obligations; and
l) Ensuring that management of human resources is appropriate to facilitate safe operations.
m) Ensuring that the annual business plan and budget is adequately resourced to achieve compliance with the SMS;
n) Ensuring that identified safety improvement objectives are implemented.

Authority: As per delegation of power

6.2.11 General Manager (Aviation Safety)

Safety Accountability

To support the safe operation of the ANS and Aerodrome Operations, GM (Aviation Safety) is accountable to ED (Aviation Safety).

Safety Responsibility

In discharging these accountabilities, the GM (Aviation Safety) is responsible for:

- Implementation of the corporate safety management system including arrangements for identifying, reporting, tracking and correcting safety issues and for the initiation of preventive action where necessary;
- Preparation and submission of the annual audit and training plan;
- Ensure the conduct of safety audits of all operational units related to safety management, at interval of 2 years but not exceeding 3 years;
- Undertaking ongoing review of the corporate safety management system to evaluate its effectiveness and ensuring that improvements are made where ever required;
- Overseeing the performance of AAI's safety management activities and providing advice on potential improvements towards safety performance;
- Support ED (AVS) in Designing, developing and managing an effective audit and safety surveillance program to enhance safe operation of the airports and Air Traffic Services;
- Support ED (AVS) in ensuring that Accountable executives, Safety managers and all AAI personnel are trained, qualified and are aware of their safety obligations and are accountable for their safety performance;
- Implementation of SDCPS across the operating directorate and data sharing with DGCA.

Authorities : As per delegation of power

6.2.12 Regional Safety Manager {Joint GM/DGM (Aviation Safety)}

Safety Accountability

To support the activities for the safe operation of the ANS and Aerodrome operations within region, Regional Safety Manager {Jt. General Manager/Deputy General Manager (Aviation Safety)} is accountable to the Executive Director (Aviation Safety) for functional responsibilities.

Safety Responsibilities

In discharging the accountabilities, the Regional Safety Manager is responsible for:

- Implementation of Safety Management System
- Safety promotion activities in the region

- Identifying, reporting & tracking safety issues for taking preventive action where necessary;
- Undertaking safety audits of aerodromes and ANS facilities as per CHQ directives;

- Overseeing the performance of AAI's safety management activities and providing advice on potential improvements to safety performance;
- Reviewing and reporting on compliance with safety management policies, plans, systems and procedures and regulatory arrangements and standards;
- Managing an effective safety surveillance program;
- Ensuring that all AAI personnel in the region are SMS trained, qualified, competent and aware to discharge their safety related obligations;
- Conduct investigations on internal safety events, in accordance with the procedures prescribed in this manual, whenever required.
- Coordinate with the regulator (DGCA), and other aviation organisations in the region for ensuring improvements in safety, where required.

Authorities : As per delegation of power

6.2.13. Station Safety Manager

The Accountable Executive at each AAI Airport /Civil Enclave /ANS centre shall designate a Safety Manager who shall be the focal point responsible for implementation and maintenance of SMS.

The Safety Manager can be selected by constituting a committee of Operational HODs, which will recommend the most suitable officer meeting the DGCA criteria as specified in SSP Circular no. 2 of 2023, considering local conditions and availability of Manpower etc. The choice of such person should not result in any conflict of interest.

Safety Manager can be designated from any operational directorate (ATM,CNS,OPS or Engg.), provided he/she meets the desirable experience and qualification as prescribed in DGCA circular . If the designated Safety Manager is not trained in SMS, then he/she should receive SMS training preferably within six months' time after taking over as Safety Manager to enable him/her to carry out the duties/responsibilities effectively.

At major Airports/ANS Units, Accountable Executive may designate separate Safety Managers for Operations, ATS and/or CNS services.

However, in such case, there shall be **one lead Safety Manager for Airport /ANS centre** who shall be the overall responsible for implementation and maintenance of SMS.

Ideally the Safety Manager should have no responsibility, other than Safety but should have a working knowledge of airport operations and ANS.

Safety Accountability

To support the activities for the safe operation, the Safety Manager is accountable to the accountable Executive for:

Safety Responsibilities & Functions

In discharging these accountabilities, the Safety Manager is responsible for:

- The effective implementation of Safety Management System,
- Providing information and advice to the accountable executive on local safety issues
- Promoting an organisational culture that fosters exemplary safety practices by demonstrating excellent safety behaviour;
- Managing phase wise implementation of Safety Management System;
- Communicating information regarding safety issues to organisation's staff, contractors and stakeholders;
- Assisting and monitoring continuous improvement in hazard identification and safety risk assessment process and review of corrective actions;
- Collection, storage and analysis of safety data for trends related to hazards, events and occurrences and forward to CHQ, whenever required;
- Convening quarterly station safety committee meeting for addressing local safety issues and review of hazards;
- Ensuring that airport personnel are trained, qualified and competent to discharge their safety related obligations; and
- Guiding/assisting in safety assessment and Change Management procedures.
- Facilitate hazard identification and safety risk analysis ;
- Monitor corrective actions and evaluate their results;
- Provide periodic reports on the organization's safety performance;
- Maintain SMS documentation and records;
- Plan and facilitate safety training
- Monitor safety concerns in the aviation industry and their perceived impact on the organization's operations aimed at product and service delivery; and
- Coordinate and communicate (on behalf of the accountable executive) with the DGCA and other State authorities as necessary on issues relating to safety.

Authorities -As per delegation of power

Qualification of Safety Manager (refer SSP Circular no. 2 of 2023)

The competencies for a safety manager should include, but not be limited to, the following:

- Safety/quality management experience;
- Operational experience related to ANS/Airport operations;
- Technical background of ANS/Airport operations to understand the systems
- Interpersonal skills;
- Analytical and problem-solving skills;
- Project management skills;
- An understanding of human factors;
- Broad knowledge of AAI's operations, procedures & activities and full-time experience in aviation safety with appropriate SMS training;

- Sound knowledge of managing safety management system and understanding of risk management principles & techniques;
- Knowledge of aviation safety regulations and documents published by ICAO, DGCA, etc.; and
- Well-developed communication skills and demonstrated interpersonal skills.

6.2.14. All AAI personnel

All AAI personnel have the following safety responsibilities:

- To comply with the relevant safety requirements and procedures (as applicable) outlined in:
  - AAI's Corporate Safety Management System Manual (C-SMSM) and any Station Safety Management System Manuals (S-SMSM)
  - Manual of Air Traffic Services (MATS) Part 1 and 2
  - CNS Manual
  - Operations Directorate Manual
  - Engineering Works Manual
  - Fire safety manual
  - Aerodrome Manual; and
  - Other duly authorized Corporate Manuals, Instructions and Notices
- To apply system safety measures as required by safety management procedures and instructions;
- To advise their next level of management of any safety occurrence or system failure and to identify and report any situation of potential risk or concern affecting system safety via one of the following means:
  - Report directly to their supervisor
  - Via team meetings
  - Submitting either an Incident report, or a Voluntary/Confidential Report
- Supporting safety audits as and when they occur; and
- Supporting safety investigations as and when they occur.

6.3 Safety Committees

6.3.1. Corporate Safety Committee

A Corporate Safety Committee shall be established at CHQ level, with the objective of making recommendations, concerning safety and reviewing safety performance of the organisation. It shall meet, **once in every calendar year** (in first quarter of the year) and as and when required. The Safety Manager of AAI i.e. ED (Aviation Safety) shall be the convenor of that meeting. The terms of reference and the constitution of the Corporate Safety Committee are given below:

Constitution of Corporate Safety Committee/Group

a) Chairman - Accountable Executive
b) Member (ANS), Member (Ops), Member (Planning), Member (HR), Member (Finance)
c) Executive Director (OPs), Executive Director (CNS -O&M), Executive Director (CNS-P I & II), Executive Director (FIU), Executive Director (ATM), Executive Director (ATFM),

Executive Director (ASM), Executive Director (CAP), Executive Director (ENG -Plg I & II), Executive Director (ENG WR/NR/ER&NER/SR),

d) Executive Director (AVS) - Convenor/Safety Manager
e) Any other member co-opted

Terms of Reference of Corporate Safety Committee/Group

- Safety performance monitoring against the Safety Policy, Objectives and promotions;
- Safety issues impacting the entire organisation and their resolutions;
- Effectiveness of safety supervision of contractual work /service for operations;
- Strategic directions on safety matters; and
- Safety issues referred by Regional and Airport Safety Committees.
- Committee may form action group/groups as required for achieving committee's decisions

6.3.2. Regional Safety Committee

A Regional Safety Committee shall be established at all the five Regional HQ with the objective of analysing and reviewing safety performance of their respective Region and shall give recommendations concerning safety issues in their region. It shall meet**, twice in a calendar year, in June & November** and as and when required. The Safety Manager of the Region, i.e. Joint GM (AVS)/DGM (AVS) shall be the convenor of that meeting. Copy of the report may be send to ED AVS with emphasis on the issues those require CHQ intervention. These issues will be presented to Corporate safety committee.

The terms of reference and the constitution of the Regional Safety Committee are given below.

Constitution of Regional Safety Committee

a. Regional Executive Director – Accountable Executive
b. General Manager (ATM)-Delhi/Kolkata/ Mumbai/Chennai
c. General Manager (ATM, CNS, OPs, Engg.,HR and Finance)- Region
d. General Manager (CNS)- Delhi/Kolkata/ Mumbai/Chennai
e. Regional Safety Manager - Convenor
f. JT.GM/DGM (Tech) & JT.GM/DGM (FIRE), Region
g. Any other member co -opted

Terms of Reference of Regional Safety Committee

- Safety issues impacting the region and their resolutions;
- Identified hazards from safety data analysis of the region and their timely corrective action;
- Review of safety recommendations;
- Safety promotion in the region;
- Review of mitigation strategies of identified risks;

- Safety performance indicator and Safety performance Target established by AAI shall be discussed & complied as part of committee report for further analysis; and
- Escalating major safety issues to the Corporate Safety Committee through the ED aviation safety.
- Committee may form action group/groups as required for achieving committee's decisions

6.3.3. Station Safety Committee

A Station Safety Committee shall be established at each airport/civil enclave/ANS Centre, with the objective of analysing and reviewing safety performance of their respective airport and shall give recommendations concerning safety issues in their airport. **It shall meet quarterly** and as and when required. The Safety Manager of the airport shall be the convenor of that meeting. It shall send safety report of every quarter to Regional HQ for compilation, analysis and further action by Region.

The terms of reference and the constitution of the Station Safety Committee are given below.

Constitution of Station Safety Committee

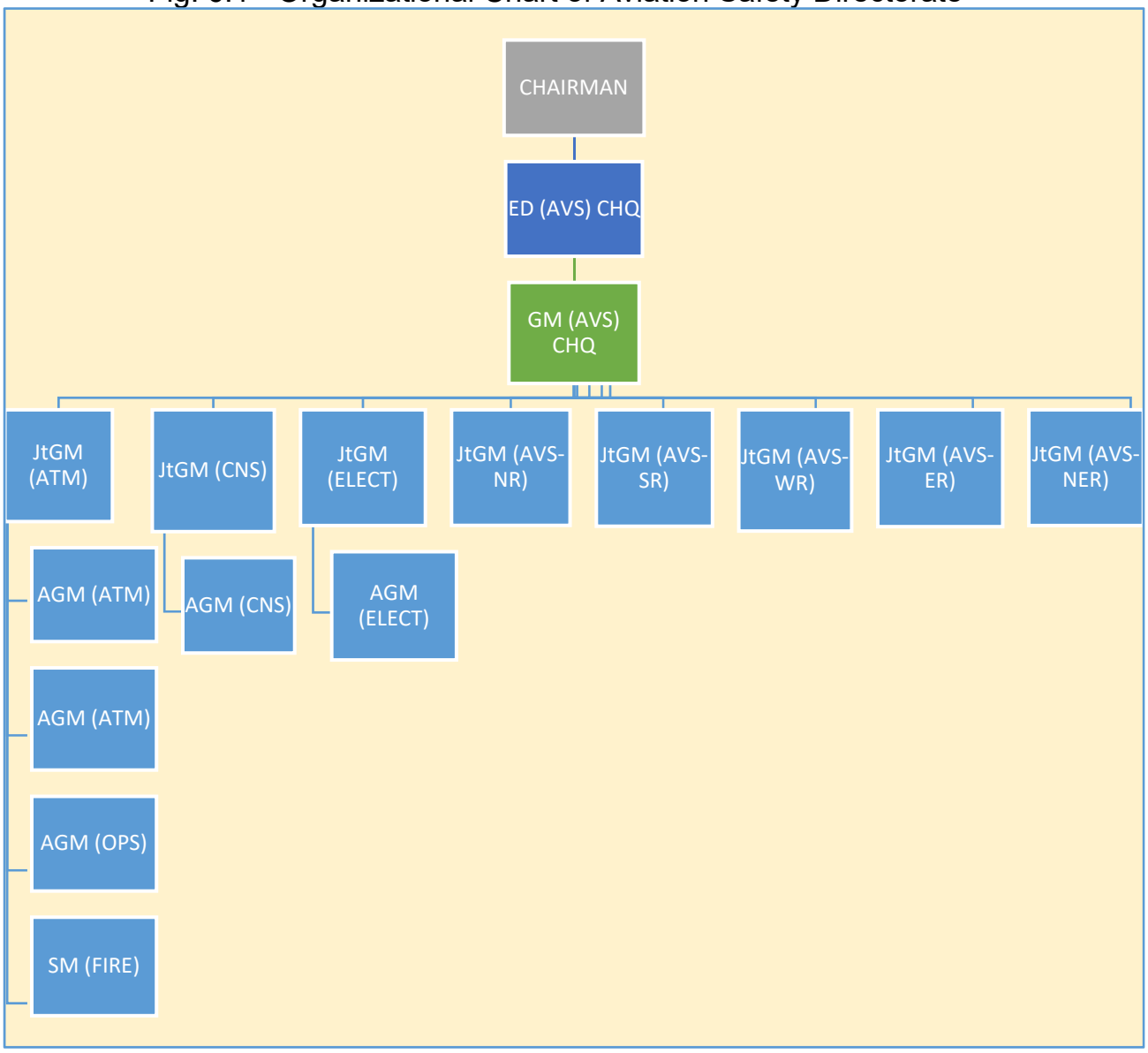
a) Airport Director/CIC/OIC/GM(ATM)/GM(CNS) - Accountable Executive
b) Safety Manager - Convenor
c) All HODs
d) Any other member co opted

Terms of Reference of Station Safety Committee

- Local safety issues of the airport/ANS Centre and their resolutions;
- Safety data collection, storage and trend analysis;
- Safety risk assessment of identified hazards;
- Review the effectiveness of mitigation measures;
- Overseeing change management; and
- The mitigation measures, action taken and /or their PDC etc. of all active Hazards in the HAZLOG register should be reviewed for timely closure.
- pending Confidential and Voluntary reports received during previous quarter should be discussed and action plan should be decided to close them.
- Escalating major safety issues to Regional and/or Corporate Safety Committees.
- Committee may form action group/groups as required for achieving committee's decisions

6.3.4 Runway safety Team: Runway safety team shall be established at each airport in accordance with DGCA CAR SECTION 4 – AERODROMES SERIES 'X' PART I, dated 8th JANUARY 2010. It shall be incorporated in S-SMS manual of Airport.

Fig. 6.1 - Organizational Chart of Aviation Safety Directorate



Chapter 7 - Safety Reporting and Remedial Actions

7.1 Introduction

7.1.1 This chapter includes both reactive (accident/incident reports, etc.) and proactive/ predictive (hazard reports) and Reporting system adopted by ANS and Airport operations.

The data used to support safety analysis is reported by multiple sources. Accurate and timely reporting of relevant information related to hazards, incidents or accidents is a fundamental activity of safety management. One of the best sources of data is direct reporting by front-line personnel since they observe hazards as part of their daily activities.

7.1.2. Effective hazard reporting is a key component of safety management. Once reported, data on hazards can be compared with other data sources to support the Safety Risk Management and Safety Assessment processes.

7.1.3 The objective of incident/occurrence reporting and investigation is to contribute to the improvement of aviation safety by ensuring that relevant information on safety is reported, collected, analysed, stored, protected and disseminated. The sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability. Incident/Occurrence reporting is an essential part of the overall monitoring function of the Airport operator / ANS provider.

7.2 Safety Reporting System

DGCA has issued Civil Aviation Requirement (CAR) Section 5 — AIR SAFETY, Series 'C' Part I, Issue II dated 20th October, 2015, Rev. 5 dated 10th June 2022] "Notification of Incidents and Investigation thereof".

AAI, as Airport operator and sole ANS Provider for the state, has comprehensive reporting system for all internal and external safety requirement conforming to ADREP taxonomy wherever required.

Operational Directorates (i.e. ATM, CNS & Aerodrome Operations) have enabled automatic data collection system to ensure collection of all air safety occurrence reports, SPI related safety data, Safety related reports in standard/desirable format for analysis and reporting.

Directorate of Aviation Safety is responsible for collecting (from concerned directorate), collating and analyzing all safety related data and for disseminating annual safety performance report based on established SPIs/SPTs and safety analysis information throughout the organization.

The sole purpose of safety information shall be for improving aviation safety and shall not be used in a way different from the purposes for which it was collected.

AAI has established a safety library at Corporate Headquarters and also at all the regions. It shall also establish safety library at all aerodromes and other locations.

7.2.1 Mandatory Safety Reporting Systems

Annex 19 requires States to establish a mandatory Safety Reporting System that includes, but not limited to, the reporting of incidents. The reporting systems developed by States and service providers should be made as simple as possible to access, generate and submit mandatory reports.

Mandatory safety reporting systems should aim to capture all of the valuable information about an occurrence, including: what happened, where, when and to whom the report is addressed.

In addition, mandatory safety reporting systems should provide for the capture of some specific hazards which are known to contribute to accidents, the timely identification and communication of which is considered valuable (e.g. routine meteorological conditions, volcanic activity, etc.).

All mandatory reportable safety occurrences mentioned in various DGCA, ATM/CNS/OPS or Aviation Safety Circulars shall be reported as per procedures prescribed in these Circulars.

7.2.2 Reporting of occurrence/incident

Accidents and serious incidents are reported to the Chairman and Member (OPS), Member (ANS) and concerned Executive Directors at CHQ, RED and Regional safety officer (DGCA) immediately by the airport director/CIC/OIC/Shift supervisor through the fastest available means such as telephone, Message etc.
Additionally, AAI has established procedure for reporting of incidents through AIMS portal.

a) All reportable incidents pertaining to ATM, OPS and CNS are to be informed to ATS In-charge/WSO by the concerned section.
b) All incidents known to or informed to ATS In-charge/WSO shall be reported by WSO/ ATS in charge through the AIMS portal Occurrence reporting module.
c) Occurrence Reports generated by AIMS portal are disseminated to concerned Directorates, REDs, DGCA and OPS control room at AAI CHQ through e-mails.
d) OPS control room also redistributes Occurrence reports to Chairman, concerned directorates & DGCA and forwards daily summary of incidents to MOCA, DGCA, Chairman and concerned directorates.

7.2.3 Reporting of Air Traffic Occurrence/Incidents:

Air Traffic Safety occurrence/incidents are reported by:

- any ATS / CNS/OPS personnel
- airline operator; or
- Pilots

Air traffic incidents/ occurrences as listed in DGCA CAR section 5 series C part 1 issue II, Rev. 5 dated 10 June 2022 are to be reported to all concerned.
Detailed procedures for reporting of Air Traffic incidents are contained in MATS, Part-1, 6.1 edition, Chapter- 3, para 3.20

7.2.4 CNS safety occurrence/incident reporting

As per DGCA, Civil Aviation Requirement (CAR) section 5 series C part 1 issue II, Rev. 5 dated 10 June 2022, the Communication Navigational and Surveillance (CNS) Incident/Occurrence are defined as-

Quote *"Significant degradation or failure of the CNS facilities including VHF/VOR/NDB/ILS/Surveillance systems, ADS/CPDLC, A-SMGCS, ground-communication. Failure of any facility used in, available for use in, or designated for use in aid of air navigation, including landing areas any apparatus or equipment, for signalling, for radio direction finding, or for radio or other electronic communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or landing or take off of aircraft"* **Unquote**

7.2.4.1 Notification of incidents/occurrences- Reportable significant degradation/ failure of CNS facilities:

Regulatory requirement provided in aforementioned DGCA CAR is followed for notification of CNS incident/occurrences. Further in compliance with above CAR, CNS -OM Dte CHQ has issued CNS Circular 06 of 2022. As per these guidelines, concerned CNS in Charge: -

- In the event of occurrence of "Significant degradation / failure of CNS facilities" at an Airport/ACS station (including Civil Enclave), shall immediately intimate about the incident/occurrence to: -
  (i) Director General of Civil Aviation (Attn. Director Air Safety, HQ
  (ii) Regional Air Safety Office(s) of DGCA

  - **Internal: -**

  (i) ED [CNS-OM], CHQ, AAI
  (ii) Ops Control Room, CHQ
  (iii) GM(CNS) of Region in respect of Non-metro Airports.
  iv) ATS In Charge/WSO

  - ANS incidents (including CNS) are also notified by WSO or designated ATM officer of concerned Airport through AAI, AIMS Portal, incident reporting tool to standard distribution list which also includes -
    - External: DGCA, HQ (Dte. of Air Safety); and Regional Air Safety Offices of DGCA
    - Internal [CNS]: Operational Control Room, ED [CNS-OM]

7.2.4.2 Intimation of Failure/Degradation of CNS facilities not reported through Aeronautical Information System (AIS) or Incident/Occurrence report:

Besides CNS occurrences/incident as mentioned in DGCA CAR, there are some events of degradation of the facilities due to short duration failures of facilities; failure of standby channels, communication media or ancillary facilities such as UPS / lightening/ surge protection systems etc., which are neither reported through Occurrence/Incident reporting procedure and nor through AIS [NOTAM]. These

events are reported to CHQ and concerned RHQ, so that necessary remedial action could be taken in a timely manner. CNS Dte has issued guidelines in this regard vide CNS Circular 04/2020
(as amended from time to time).

7.2.4.3. CNS Occurrence/Incident Investigation:

Besides investigation of CNS incidents/occurrence done by regulatory or any other statutory/competent authority, it is also essential that CNS occurrences/incidents and other events which may lead to incidents in future are investigated internally, and, if required a corrective action plan be developed and implemented purely for the purpose of internal standardisation, quality assurance and systematic improvement in maintenance management and operation of CNS/ATM and ancillary systems. Guidelines on internal investigation have been issued by CNS Dte. vide CNS Circular 02/2020 and CNS circular 6 of 2022.

Preliminary investigation is conducted by CNS In-Charge of the station as expeditiously as possible after receipt of incident/occurrence report. CNS In-Charge may depute a senior executive or may form a committee at station level for investigation and suggesting remedial action. If required, a multi-disciplinary committee may also be formed with the consent of Airport In-Charge for incident/event investigation.

If required, a team of Standard and Quality Assurance Section from Dte. of CNS-OM, CHQ may visit the station to further investigate the incident and submit the detailed report on cause(s) of incident/occurrence and remedial action to be taken.

7.2.5 Airport Operations safety occurrence/incident reporting

- Upon receipt of information regarding ground accident / incident or suspected bird/wildlife hit, the Airside Duty Manager shall dispatch a competent staff to the incident/ accident site with camera and cones/ropes (for cordoning off the area, if required), immediately. Dispatch the airside ambulance to accident site if needed;
- Inform AGM (ASM)/ DGM(ASM)/ HOD Airside Ops / APD besides initiating immediate necessary action;
- Preliminary Investigations shall be carried out by the representative of Airside Operations. The following information shall be recorded for further investigation.
  - Location of accident/incident
  - Time of accident/incident
    - Details of accident
    - Damage to aircraft, vehicle, property or injuries, death if any.
    - Identification of person(s) involved in the incident/accident
    - Details of eyewitness if any.
    - Photograph of accident site/ dead bird or animal, if possible.
- Information shall be given to AOCC (wherever available) or to the responsible official for Airside Management with the least possible delay for onward information to all concerned as per the call list. Duty Manager Airside

Operations shall inform Airside Operations at the earliest with preliminary information regarding incident/accident;

- In case of death of a person, information shall be given to CISF and local police;
- Information shall be given to ATC, if the accident involves aircraft or vehicles obstructing operation of aircraft;
- Furnish the above details to AOCC (wherever available) or the responsible official for Airside Management at the airport;
- **Incident/Accident should be immediately informed on telephone to Member (Ops), ED(Ops) giving all available details;**
- DGCA should be informed within 24 Hrs of an accident occurrence and within 48 hours of an incident;

- No vehicles or equipment shall be removed from the accident site as far as possible, till the time investigation is over. In case the accident/incident involves the aircraft, no evidence shall be tampered till the time clearance is given by the DGCA or appropriate authority;
- In case of accident takes place in the maneuvering area which obstructs the movement of aircraft and not required for the investigation, Airside Operations shall review the situation and remove the vehicle/s or equipment in consultation with APD / HOD Airside.
- In case the part of the movement area is required to be blocked necessary, information shall be given to ATC, AOCC followed by NOTAM initiation;
- Official of Airside Operations shall confiscate the ADP of involved drivers, if it involves any driver(s) and obtain written statement of the driver/s or persons involved in the accident/incident countersigned by their supervisor(s)/manager;
- The alcohol test of the person/driver(s) shall be carried out with the breath analyzer machine available with Medical Room. The test shall be carried out in the presence of the person/driver(s)'s supervisor/ manager and ensure that the supervisor/manager of concerned agency has countersigned in the report as witness. The charges for such test shall be collected from the same driver/s or their employer;
- Preliminary Report shall be prepared by the duty manager Airside Operations in the following format-
  - Details of incident;
  - Findings;
  - Cause of incident;
  - Person(s) responsible for the incident; and
  - Recommendation for preventing such incident in future and action taken thereof.

- Make proper log entry in chronological order;
- Duty manager handling Airside operations shall brief the DGM(ASM)/AOCC regarding the complete occurrence of incident/accident after the normalcy is established;
- AOCC/Responsible official will-

i) Inform the incident to Duty Managers of all the concerned department which needs to act on the incident as well as the outside stakeholders concerned;
ii) Inform the HOD's of concerned departments as well as APD depending on the gravity of the incident;
iii) Activate medical and other emergency services to the accident site;
iv) Inform Safety Department of airport operation and all other relevant authorities;
v) Pass relevant information to ATC regarding blocking of area; and
vi) Inform and coordinate with MT Section for any real time requirement.

- **Role of airport operation safety Dept.**
  Collection of accident detail and investigation in coordination with Airside Operations team and preparation of report for onward submission.

7.2.6 Reportable occurrences:

Reportable occurrences for AIR NAVIGATION SERVICES, AERODROME AND GROUND FACILITIES (Reference.DGCA CAR section 5 air safety series C part 1 issue II rev 5 dated 10th June 2022)

A) Air Navigation Services

- Significantly incorrect, inadequate or misleading information from any ground sources, e.g. Air Traffic Control (ATC), Automatic Terminal Information Service (ATIS), Meteorological Services, navigation database, maps, charts, manuals, etc.;
- Provision of less than prescribed terrain clearance;
- Provision of incorrect pressure reference data (i.e. altimeter setting);
- Incorrect transmission, receipt or interpretation of significant messages when this results in a hazardous situation;
- Separation minima infringement;
- Unauthorised penetration of airspace;
- Unlawful radio communication transmission;
- Significant degradation / failure of CNS facilities; and
- Aerodrome movement areas obstructed by aircraft, vehicles resulting in a hazardous or potentially hazardous situation.
- Take-off or landing incidents, including precautionary or forced landings. Incidents such as under-shooting, overrunning or running off the side of runways. Rejected take-offs, landings or attempted landings on a closed, occupied or incorrect runway.
- Runway incursions.
- GPWS warning.
- ACAS/TCAS RAs

B) Aerodrome and Ground Facilities

- Significant spillage during fuelling operations;
- unsatisfactory ground de-icing / anti-icing;
- Errors or inadequacies in marking of obstructions or hazards on aerodrome movement areas resulting in a hazardous situation;
- Failure, significant malfunction or unavailability of airfield lighting; and
- Aerodrome movement areas obstructed by aircraft, vehicles, animals or foreign objects, resulting in a hazardous or potentially hazardous situation.
- All Wildlife Strikes and wildlife movement is required to be reported in the enclosed Performa.
- Ground Collision Incidents: – Collision while taxiing
- Ground Handling (RAMP) incidents.
- Jet/propeller blast incidents resulting significant damage or serious injuries.

7.2.7. Confidential and Voluntary safety reporting systems

- Confidential and Voluntary safety reporting system is established to collect safety data and safety information not captured by the mandatory safety reporting system. These reports go beyond typical incident reporting.
- Such reports tend to illuminate latent conditions, such as inappropriate safety procedures or regulations, human error, etc. One way to identify hazards is through voluntary or confidential reporting.
- There are situations where the person reporting a hazard may not like to disclose his/her identity. In such cases, there is a provision to make a Confidential/ Voluntary Report regarding a potential aviation hazard or occurrence of an incident.
- Disclosing identity of reporting person is not mandatory in Confidential / Voluntary reporting.
- Complete confidentiality of the system and strict anonymity of the system is ensured. Anonymous reports are accepted but it is requested that the reporter gives his/her identity to enable later contact for any clarification.
- All AAI personnel have an obligation and are encouraged through Positive Safety Culture / non-punitive safety culture in AAI, to report any occurrence, or hazard that may, if left untreated, lead to an accident or incident occurring.
- All AAI airports / ANS units shall establish a Voluntary Hazard /Occurrence reporting system, to enable to report unsafe events voluntarily.
- Voluntary Hazard /Occurrence reporting system at AAI airports /ANS Units may be established by putting boxes with simple Voluntary / Confidential Hazard / Event Reporting form (AAI-SAF-101) at appropriate places in the airport, so that they are readily available for all users and employees of the aerodrome.
- If any person is not confident in using Voluntary Reporting form, he / she can report on a plain paper in his / her own vernacular language. On receipt of such a report, the report shall be de-identified before investigation (if identity is mentioned).
  The Confidential reports should be addressed to Accountable Executive (RED/APD/CIC/OIC) or may be sent directly to: -

Executive Director
Directorate of Aviation Safety
Airports Authority of India
Rajiv Gandhi Bhavan,
Safdarjung Airport
New Delhi – 110003

- The Accountable Executive will take appropriate action on Confidential report in consultation with concerned HOD to avoid reoccurrence of such event.

  The Concerned Safety Manager shall collect all voluntary reports on regular intervals (at least once a month) for its proper disposal. The Safety Manager will put up the report to the concerned HOD or the Accountable Executive for further action.

  The Hazard / occurrence reports received in the Confidential /Voluntary Reports should be treated in the AAI-SAF-105 form and all active hazards should be transferred to the HAZLOG (AAI -SAF-127).

- During quarterly Safety Committee Meetings, the all pending Confidential and Voluntary reports received during previous quarter should be discussed and action plan should be decided to close them.

  The quarterly Action taken report shall be submitted to ED (Aviation Safety).

- The information collected through Confidential / Voluntary Safety Reporting System shall be handled in a manner so as to prevent its use for purposes other than Aviation Safety and shall appropriately be safeguarded.

Lesson learnt from such reports may be circulated to aviation community in the form of Safety Bulletin. Specific problems or trend can be brought to the attention of the appropriate authorities for taking necessary preventive measures and follow up.

7.2.8 Online Voluntary Reporting System in AIMS Aviation Safety Module

- To encourage voluntary safety reporting, in addition to the currently used station level offline mode (Voluntary Hazard reporting Boxes), a web-based reporting system has been introduced to the AIMS Aviation Safety Module, making the Voluntary Safety Reporting System easily accessible to AAI staff.
- **In addition to the AAI staff, the On line Voluntary Reporting System is available for reporting Hazards and Safety Issues by all stake holders at Airport i.e. Any person /employee of any Airline/Agency/ Organization can access this platform to report safety issues /hazards at AAI Airports /Civil Enclaves and ANS Centers. (No login is required)**
- The Airport Directors /CIC/OICs and Safety Managers should notify thru local communication and sensitize all stake holders in the monthly meetings about

On-line Voluntary Reporting System and encourage them to report safety issues**.**

Airports/ANS centers may display stickers at appropriate locations in **+**of the Airport notifying **" If you observe any safety issue at our Airport , please report to Airport Director/CIC/OIC on Email ID _____ or Phone No. _____or report On line on URL https://aims.aai.aero/aims/VRS/VoluntaryReportForm.jsp"**

The link is also available on AAI Website main page >Important Link >Voluntary Safety Reporting.

- With introduction of online Voluntary Reporting System, existing procedures of Voluntary reporting by using HazID boxes, installed at stations, shall continue.
- Anyone who witnesses or is involved or has knowledge of an occurrence, hazard or situation which he or she believes possess potential threat to flight safety is requested to report the same through this platform.
- **No login is required and submission of name and contact details is not mandatory**. If Identification details are provided, same will be kept confidential.
- The hazard/occurrence information shall be analyzed for follow up action. Feedback may be provided in case contact details have been provided.
- ED(ATM)/ED(CNS)/ED(OPS) and APD/CIC/OIC are required to regularly login to VRS Portal at "AIMS for Aviation Safety Module" to check and act upon pending voluntary reports.

7.2.8.1 Process Flow

7.2.8.1.1 The Online Voluntary Reporting System has been divided into three levels of access:

a) **User Level:** Can be accessed by any AAI Official who wants to report any hazard or situation (***No login required***). URL: https://aims.aai.aero/aims > AIMS for Aviation Safety >Voluntary Reporting form.

b) **APD/CIC/OIC Level**: Online Voluntary Reporting System portal can be accessed by APD/CIC/OIC of the airport/ANS unit. User Id and Password will be same as that of existing Aviation Safety portal in AIMS.

URL: https://aims.aai.aero/aims > AIMS for Aviation Safety>VRS Portal

(c) CHQ Level: Online Voluntary Reporting System portal can be accessed by ED(AVS), ED(ATM), ED (OPS), ED (CNS) and GM(AVS). User Id and Password will be same as that of existing Aviation Safety portal in AIMS.

URL: https://aims.aai.aero/aims >AIMS for Aviation Safety> VRS Portal

7.2.8.3 The process flow for the Online Voluntary reporting system, will be as below-

A. **Voluntary Reporting Form:** can be filled by any AAI Official.

The user will have to fill mandatory details:

Date and Time of Occurrence /Observation

Location and Description

In addition, user may upload relevant image/pdf/video of Occurrence/Observation. Once user submits the form, an acknowledgement number is generated.
If provided, the Identification details of the reporting personnel will be kept confidential.

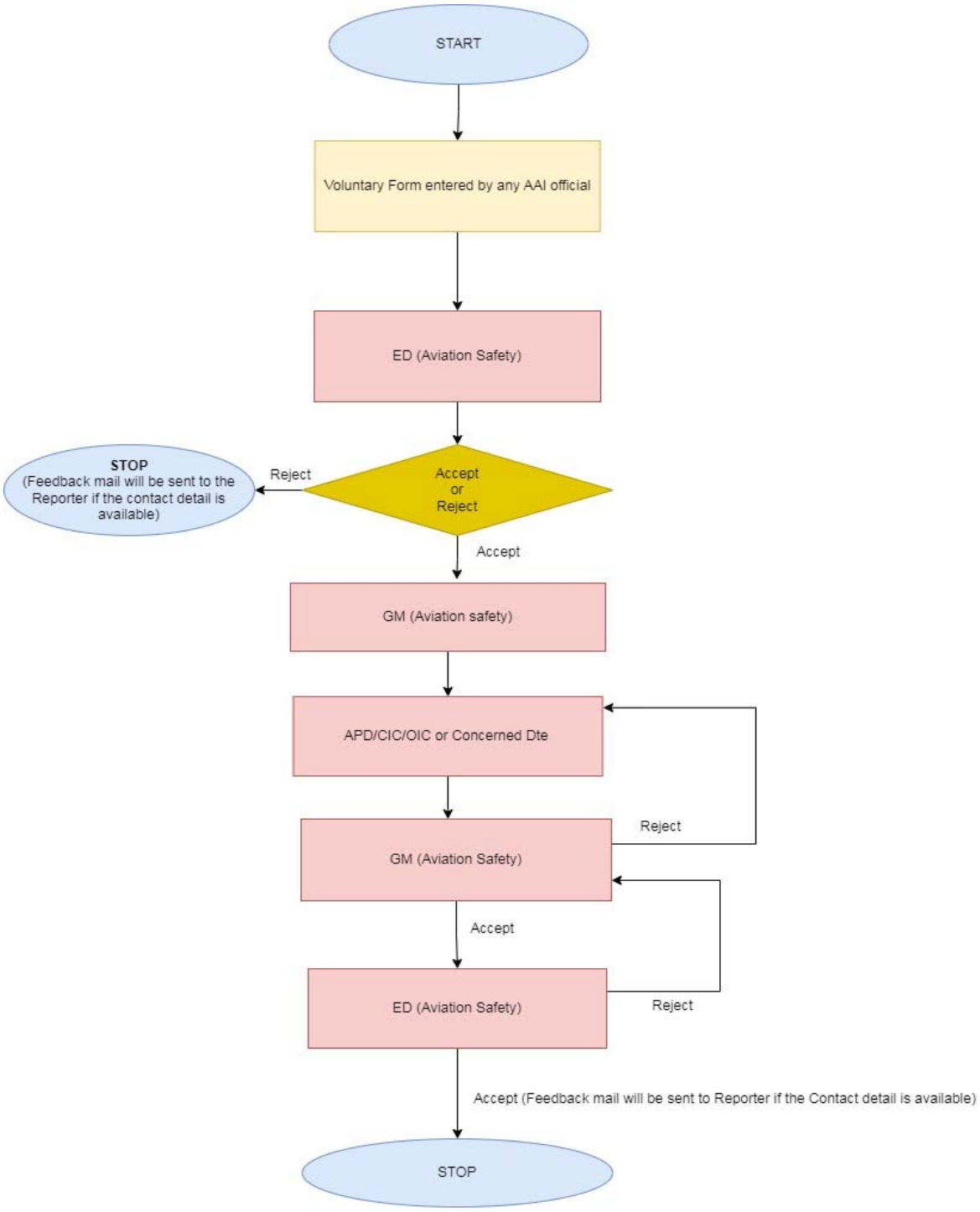
B. **Voluntary Reporting Form Verification –**The Voluntary Hazard/Occurrence reported by the AAI official are scrutinized and accepted or rejected by the Office of ED Aviation Safety.
Issues not pertaining to aviation safety will not be entertained. A message will be sent to the Reporter's email Id (if provided) in case report is rejected.

On acceptance, the Voluntary Report is forwarded to the concerned Directorate (ATM/CNS/OPS) or Airport Director/CIC/OIC for further action in the AIMS Voluntary Reporting System Module.

C. **Action Taken Report -** The analysis of the Voluntary report received from Directorate of Aviation Safety has to be carried out by the concerned Directorate or Airport Director/CIC/OIC. Entire Safety Risk Management process can also be completed using this tool online.
   - If the risk accepting authority is at Station level, then 'Accept' in the acceptance status and submit.
   - If the Risk's Acceptance Authority is at RHQ/CHQ level ~~,~~ then the duly signed copy (by appropriate risk accepting authority) of HAZID Form (AAI-SAF-105) shall be uploaded through upload option and then 'Accept' in the acceptance status and submit.
   - *Process will be incomplete, until uploading duly signed copy of HazID form. Incomplete process can be saved selecting Acceptance status as "Pending" and click "Submit" button. It shall remain in the view screen of the APD/CIC/OIC showing status as 'Pending'*.

D. Action Taken Report Validation and Finalization - The action taken report obtained from concerned Directorate or Airport Director/CIC/OIC are validated and finalized by the Directorate of Aviation Safety. If the Action Taken Report is Not-Satisfactory then it can be reverted back for the review. Upon Validation and finalization of the Voluntary report, a feedback message will be sent to the User's email Id (in case email ID is provided). Validated and finalized Voluntary Hazard/Occurrence report will be available in database for record purpose.

Flow diagram of VRS



7.3 Safety Culture

A safety culture is the natural consequence of having humans in the aviation system. Safety culture has been described as “how people behave in relation to safety and risk when no one is watching”.

It is an expression of how safety is perceived, valued and prioritized by management and employees in an organization, and is reflected in the extent to which individuals and groups are:

a) Aware of the risks and known hazards faced by the organization and its activities;
b) Continuously behaving to preserve and enhance safety;
c) Able to access the resources required for safe operations;
d) Willing and able to adapt when facing safety issues;
e) Willing to communicate safety issues; and
f) Consistently assessing the safety related behaviours throughout the organization.

7.3.1 National culture differentiates the characteristics of particular nations, including the role of the individual within society, the manner in which authority is distributed, and national priorities with respect to resources, accountabilities, morality, objectives and legal systems.

7.3.2 From a safety management perspective, national culture influences organizational culture and plays a large part in determining the nature and scope of regulatory enforcement policies, including the relationship between regulatory authority personnel and industry personnel, and the extent to which safety information is protected. These, in turn, impact on peoples’ willingness to report safety issues.

7.3.3 Organization’s safety culture may also be significantly affected by the variety of cultural backgrounds of the members of its workforce.

7.4 Developing a positive safety culture

Annex 19 requires that both States and service providers promote a positive safety culture with the aim of fostering effective safety management implementation through the SSP/SMS.

A positive safety culture has the following features:

a) Managers and employees, individually and collectively, want to make decisions and take actions that promote safety;
b) Individuals and groups continually critique their behaviours and processes and welcome the critique of others searching for opportunities to change and improve as their environment changes;
c) Management and staff share a common awareness of the hazards and risks faced by the organization and its activities, and the need to manage risks;
d) Individuals act and make decisions according to a common belief that safety is part of the way they do business;

e) Individuals' value being informed, and informing others, about safety; and
f) Individuals trust their colleagues and managers with information about their experiences, and the reporting of errors and mistakes is encouraged to improve how things are done in the future.

7.4.1 Consistent with our individual safety responsibilities, all AAI personnel are required to report instances of human error (or near-misses) that they are personally involved in and on the understanding that errors are the outcome of being human, the existing system and / or our individual behavioral choices.

7.4.2 It is imperative that we learn from our mistakes, strive to reduce instances of human error in the future and to develop systems that are more error-tolerant.

7.4.3 It is recognized that the achievement of enhanced safety outcomes will be materially facilitated through the uninhibited reporting of all incidents and occurrences that compromise safety within our operating environment.

7.4.4 To assure this outcome, all AAI personnel are advised that under the terms of this '**Positive Safety *Culture'*** policy, no disciplinary action will be taken against personnel who reports an incident or occurrence involving human error and /or who openly participates in the investigation and subsequent development of error-prevention strategies.

7.4.5 This policy will not apply to employees who have behaved in a 'reckless' or illegal manner or who have committed a series of human errors that indicates a general lack of care and professionalism.

7.5 Safety Library

The objective of a safety library is to analyse the safety data received from various sources to arrive at a meaningful conclusion which is cost effective for resolution of safety issues confronting the organization.

The safety data should preferably be stored in an electronic data base which facilitates query and generation of analysis output in a variety of useful formats.

Safety Data compiled and analyzed shall be used only for the purpose of advancing aviation safety. Its access shall be limited to the persons who are essentially required to know it. However, safety recommendations issued based on the analysis of safety data shall be disseminated to all concerned stakeholders to improve safety.

7.6 Safety Data analysis and publication procedure

Safety Data collected through occurrence/ incidents reports is compiled in the AIMS portal. AIMS portal has the provision to generate reports in different format such as for each occurrence category, Region/ Airport or specific period etc.

Concerned directorate are responsible for analysis of the reports and take appropriate action.

Aviation Safety Directorate monitors the occurrence data, reports, and advises concerned directorates for suitable remedial actions. Safety Directorate also prepares annual report of SPIs & SPTs and sets target for next year.

7.6.1 ATM Data

ATM Directorate ensure entry of the following data/ information in the relevant AIMS portal :-

- Number of arrivals and departures
- Overflights;
- Number of bird hits
- Duration of runway closures (e.g. due to maintenance)
- Details of runway incursions
- Level bust
- Communication error
- Details of airprox occurrences
- Details of breach of separation
- Details of TCAS RA occurrences;
- Special Air- report (AIREPs)
- Unauthorized laser interference reports
- Remotely piloted aircraft systems
- Other reportable incidents as per MATS Part 1.

7.6.2 CNS data

CNS Directorate shall ensure entry of the following data/information in the AIMS portal :-

- Unserviceability/unavailability data of CNS facilities viz (ILS, DVOR, NDB, DME etc.) and surveillance aids (ASR, ARSR, ASMGCS & ADS-B)
- Failures of VCCS (VHF) and HF.
- Degradation of Automation system
- Calibration reports (Navaids); and
- Performance reports of CNS Facilities against benchmark.

In case of redundant systems, the unserviceability/failure of any systems should be considered.

7.6.3 Airports (Operations) Data

The Operations Directorate shall ensure entry of the following data/information in the AIMS portal :-

- aircraft accident
- aircraft incident;
- Runway excursion
- Airside fire incident (other than aircraft)
- Wildlife/Bird strike
- failure of Aerodrome ground Lighting
- other reportable incidents like FOD etc.;
- Ramp incident
- Runway incursion

- Apron violations.
- Dangerous Goods accident & incident reports
- Runway surface condition report

7.7 Submission of Investigation report of safety Incidents to Aviation Safety Directorate:

Preliminary investigation of incidents is conducted by the concerned department (ATM, CNS or OPS) of the station and the investigation report is submitted to the concerned directorate at CHQ and others as per their procedures.

However, whenever required, concerned directorate/ Airport Directors/ OICs shall submit the Preliminary investigation report and additional information to Aviation Safety Directorate, CHQ/RHQ for further actions/ analysis. Aviation Safety Directorate may conduct independent investigation of any incidents whenever required.

Chapter 8 - Hazard Identification and Risk Assessment

8.1 Introduction

8.1.1 Hazards are an inevitable part of aviation activities; however, their manifestation and possible adverse consequences can be addressed through mitigation strategies which aim to contain the potential for the hazard to result in an unsafe condition. Aviation can coexist with hazards so long as they are controlled.

8.1.2 Hazard identification is the first step in the Safety Risk Management process. It precedes a safety risk assessment and requires a clear understanding of the hazards and their related consequences.

8.1.3 This chapter introduces methodologies for identifying Hazards, steps of safety risk assessment process for air navigation services and airport operations.

8.1.4 It details the Safety Risk Assessment Matrix and the Residual Risk accepting authorities.

8.2 Hazard Identification

8.2.1. Hazards are detectable through use of reporting systems, inspections, PHA workshop or audits. Hazards can also be identified from the review or study of internal and external investigation reports. The review of accident / incident investigation reports for hazards is a good mechanism to enhance an organization's hazard identification system.

8.2.2 Hazards can also be identified through safety data analysis which identifies adverse trends and makes predictions about emerging hazards, etc.

8.2.3 Hazard identification should also consider hazards that are generated outside of the organization and hazards that are outside the direct control of the organization such as extreme weather or volcanic ash.

8.2.4 Hazard Identification is a continuous, ongoing and daily activity. Hazards can be reported from any source. The need for hazard identification is essential in the following conditions:

- Unexplained increase in safety related events
- Regulatory non-compliance
- Significant changes to the organization or its activities

8.2.5 Hazard identification shall be based on a combination of reactive, pro-active and predictive method of safety data collection.

8.2.6 Analyzing the hazards identified during an incident or accident investigations is an example of a reactive methodology. A proactive one might include hazards identified during audits or inspections, or from mandatory reports.

8.2.7 Hazards may be identified through various data sources, which can be either internal or external.
Some examples of internal hazard identification data sources include voluntary and mandatory reporting system, safety survey, and safety auditing and follow-up reports on accidents / incidents.
Some examples of external hazard identification data sources include State voluntary and mandatory reporting systems, State oversight audit and safety information sharing system.

8.2.8 Each Airport/Civil Enclave /ANS Center must establish a single compiled Hazard register (HAZLOG), which should contain all active hazards of the Airport /Civil Enclave /ANS center.
An online centralized HAZLOG portal (in the standard AAI-SAF-127 format) is available under “AIMS for Aviation Safety Module” which should be utilized for maintaining active Hazards register for the station. The Safety Manager is responsible for management of HAZLOG / Hazard Register.

8.2.9 It is not uncommon for people to confuse hazards with their consequences. **A consequence is an outcome that can be triggered by a hazard**. For example, a runway excursion (overrun) is a potential consequence related to the hazard of a contaminated runway. By clearly defining the hazard first, one can readily identify the possible consequences.

8.2.10 All relevant stakeholders are required to participate in hazard Identification workshops.

8.2.11 All personnel should receive Safety Management Training to enable them to identify and report hazards. Hazard identification is everybody’s responsibility.

8.2.12 Safety Committee will ensure that Airport staff, tenants and contractors are made aware that they will not be penalized for reporting about hazardous incidents, which occurred without intention.

8.2.13 Any Airport staff, tenants and contractors who report hazards or incident with his personal details will be given feedback by the Safety Manager.

8.2.14 Employees are not compelled to disclose their identity while filing the voluntary /Confidential incident/hazard reporting forms, with the purpose to ease fear of punishment.

8.3 Techniques for Hazard identification

Some of the techniques of identifying the hazards include checklist, brain storming session (HAZID/PHA Workshops) and Failure modes and Effects Analysis (FMEA) .

FMEA :- When the focus of the Hazard Identification workshop is equipment based hazards, then attention on possible equipment faults and failures may be the best way to generate a list of Hazards .This is called Failure modes and Effects Analysis (FMEA) .

FMEA differs from HAZID workshop in that for each component or procedural step in question, the group first considers the desired system state and then looks at how that may not be achieved i.e. how the system might fail.

Similar to HAZID , the workshop group should brainstorm failure modes before resorting to the check list.

Typical FMEA prompts
Total system failure, Partial system failure, anomalous system behavior
The possibility of common mode failures **The simultaneous occurrence of more than one fault**
Human errors
External variations of failures affecting the integrity of external data, services, security, power supply, or environmental conditions

8.3.1 Methodologies for identifying hazards:

a) **Reactive.** This methodology involves analysis of past outcomes or events. Hazards are identified through investigation of safety occurrences. Incidents and accidents are an indication of system deficiencies and therefore can be used to determine which hazard(s) contributed to the event.

b) Proactive. This methodology involves collecting safety data of lower consequence events or process performance and analyzing the safety information or frequency of occurrence to determine if a hazard could lead to an accident or incident. The safety information for proactive hazard identification primarily comes from flight data analysis (FDA) programmes, safety reporting systems and the safety assurance function.

8.3.2 Consideration during hazard identification process:

- System description;
- Design factors, including equipment and task design;
- Human performance limitations (e.g. physiological, psychological and Cognitive);
- Procedures and operating practices, including their documentation and Checklists and their validation under actual operating conditions;
- Communication factors, including media, terminology and language;

- Organizational factors, such as those related to the recruitment, training and retention of personnel, the compatibility of production and safety Goals, the allocation of resources, operating pressures and the corporate Safety culture;
- Factors related to the operational environment of the aviation system (e.g. Ambient noise and vibration, temperature and lighting);
- Regulatory oversight factors, including the applicability and enforceability of regulations and the certification of equipment, personnel and Procedures;
- Performance monitoring systems that can detect practical drift,
- Operational deviations or a deterioration of product reliability;
- Human-machine interface factors; and
- Factors related to the SMS/SSP interfaces with other organizations.

8.3.3 Potential source of hazards can be:

- Accident/Incident Investigation reports;
- Random tape transcription record;
- Operational data monitoring;
- Internal safety audits;
- Routine operational reports, hazard reports, incident reports & maintenance reports;
- Hazard workshops; (during Change management)
- DGCA regulatory audits & surveillance activities;
- Mandatory occurrence reports;
- Voluntary/Confidential reports;
- Safety surveys;
- Quality audits;
- Manufacturers report;
- Safety Information exchange,
- field inspection,
- log book extracts,
- Operational Risk Registers

8.4 Hazard Analysis

Hazards analysis should be carried out utilising the AAI-SAF-105 form.
In this step the likelihood and severity of each consequence of each hazard is identified by following Safety Risk Probability as shown in Table- 8.1 and Safety Risk Severity as shown in Table- 8.2 respectively by considering existing risk control. Thereby, the initial **risk is** determined.

- After the determination of the initial risk, the consequence or outcome of the hazard necessitate the introduction of potential risk controls to mitigate the effect of the hazard and to bring it down to As Low as Reasonably Practical (ALARP) Refer figure 8.1.
(Follow the Safety Risk Assessment Matrix as shown in Table- 8.3).

8.5 Documenting Hazard in AAI-SAF-105 A

Other than Hazards identified and listed in PHA of SCARS form, the Hazards identified during the additional workshops conducted when overall safety magnitude of Change /project is Moderate / Major or Hazards reported through VRS, Confidential Report etc. must be documented in the template i.e. Form AAI-SAF-105 A Hazard Listing form.
A single hazard can have many consequences; accordingly, each consequence should be listed separately.

8.5.1 Analysis of Hazards

All hazards identified and listed in PHA form (Step 2 of SCARS) and /or listed in AAI-SAF-105 A form shall be analyzed in AAI-SAF-105 Format.

Each consequence of an identified hazard should be recorded in a different HAZID form (AAI-SAF-105) and should have a unique ID number.

Each hazard-consequence combination should be given a separate index number, so that tracking of specific risks will be easier. The hazard numbering format suggested below may be followed at stations: -

:

- Hazards should be allotted a Unique Hazard ID number in the format HAZ/VXXX/SSS/HHHH-CC.
- For example, a hazard identified at Guwahati airport pertaining to a CNS process should be numbered as HAZ/VEGT/CNS/0001-01. If the same hazard is having a second consequence, whose risk is to be managed separately, the same hazard will again be recorded as HAZ/VEGT/CNS/0001-02 with second consequence.
- Wherever there is no location indicator, first four letters of the location name may be used in place of VXXX;
- The abbreviations to be used for the various departments in the hazard number format (SSS) are ATM, CNS and OPS (Airside Operations);
- The hazard numbers will be allotted by the custodian of the Risk Register;
- Project Risk Registers are managed by Project Managers (HODs or officials deputed by them). Thus, for a particular project, a series of hazard

numbers will be allotted by the Project Manager.

8.5.2 Hazard Register (HAZLOG) (AAI-SAF-127)

A single Hazard register in standard HAZLOG template (AAI-SAF-127) shall be maintained for the airport, which will contain **all active hazards**, extracted from individual project Risk register (PRR), ORR, Voluntary/Confidential reporting or any other source.

Each active hazard along with its consequences, initial risk assessment (with existing risk control), Residual risk (with potential risk control and recovery measures) as carried out in HAZID form shall be summarized & documented in an objective manner in a HAZLOG (AAI-SAF-127) register along with action officer for implementation of potential risk control and recovery measure, current status & review date.

Hazards which are removed from the HAZLOG (AAI-SAF-127), on elimination or closed, should be retained in the safety library of the airport.

The mitigation measures, action taken and /or their PDC etc. of all active Hazards in the HAZLOG should be reviewed in quarterly Station Safety Committee meeting for timely closure.

The Hazard Register (HAZLOG) (AAI-SAF-127) management cycle activities must be completed at least annually.

8.5.3 Hazard Status

Hazard status is of two types:

1. **Active**: A hazard is defined as active when it requires ongoing management of controls and has the potential to or currently is, affecting the operational environment. An active hazard can exist in an ongoing project.
2. **Closed**: A Hazard is defined as closed when it no longer affects the operational environment. This status can be assigned to a hazard through an appropriate PIR process. A Hazard cannot be closed if there are still controls associated with it.

8.5.4 Project/ Change Risk Register (PRR) – AAI-SAF-111

Where new services, units or systems are introduced into the operational environment, a consolidated Project/Change Risk Register for all the phases may be established as part of the process followed by a Post Implementation Review (PIR) of an operational change, alongwith entry in AAI-SAF-127(AIMS).

Hazards identified during the PHA, HAZID workshops of all stages of the project life cycle should be analyzed using AAI-SAF-105 form thereafter entered in to the Project / Change Risk register.

PRR should be reviewed periodically but not later than every three months.

PRR shall be finally reviewed on completion of the project/ change that has been inducted in the operational service and any Hazards that still remain “active” must be transferred from the project/change Risk Register into the concerned ORR & PRR shall be closed.

8.5.5 Operational Risk Assessment Process and Register (ORR)- AAI-SAF-111

All operational service delivery units (e.g. ANS, OPS) must establish an Operational Risk Assessment Process.
The Operational Risk Assessment process requires the identification, assessment, control and management of existing and potential safety hazards for operational services during post implementation review and that all types of control continue to achieve their intended objectives. It also provides for the identification of the need for new safety risk controls because of changes in the operational environment.

Operational units in ATS, CNS and Operations must maintain a **Operational Risk Register** wherein, any Hazard/risk identified during running/ continuation of operation by any front-line personnel can be recorded.
ORR should be reviewed periodically but not later than every three months.

Safety manager is responsible for collecting all hazards from ORR and putting up to the concerned HODs for mitigation of Risk.

Identified hazards shall be analyzed by using HAZID (AAI-SAF-105) form for appropriate mitigation measures and acceptance of residual risk.

8.6 Safety Risk Management

8.6.1 Safety Risk Management is the process of assessment and mitigation of the safety risks of the consequences of identified hazards to a level As Low as Reasonably Practicable (ALARP).
Safety Risk Management begins with identification of hazards and their consequences, assessment of safety risk, mitigation of the risk, acceptance of residual risk, monitoring the risk control measures and periodical review of the risk.

8.6.2 Safety Risk Assessment

Safety risk assessment is the process of determining the probability and severity of each consequence of hazard.
Each consequence of identified hazard must be assessed in terms of probability and severity to determine the related risk.

Safety Risk Assessment must be conducted for all hazards reported through any source such as, voluntary/ confidential reporting, Operational Risk register, project risk registers and PHA / HAZID workshops for new project/ change management.
Safety Manager is responsible for collecting all hazards and putting up to the concerned HODs for mitigation of Hazards.

The responsibility of mitigation of the risks will be with the Process Owner.

Hazards reported through voluntary/ confidential reporting and Operational Risk register, shall be mitigated by the concerned HOD on a regular basis (not exceeding three months). Hazard analysis should be done using the AAI-SAF-105 form.

8.6.2 Safety Risk Assessment must be conducted throughout the project lifecycle. These activities must commence at the concept phase and continued through the design, execution, commissioning and operation phase.

8.7 Principles of Safety Risk Assessment Process

8.7.1 The following principles underline AAI's approach to Safety Risk Assessment:

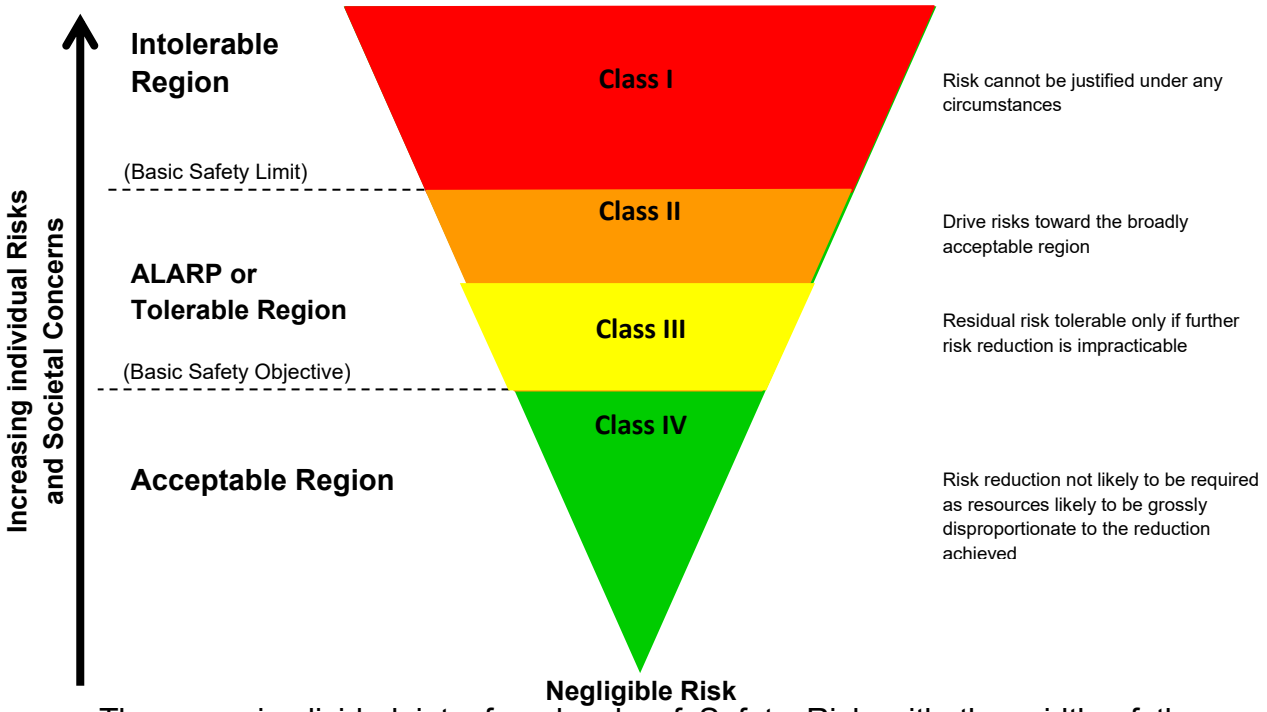
a) The core of a Safety Risk Assessment is the systematic risk assessment done by the operational and technical management which identifies hazards, assesses risk, and decides what control measures are needed;
b) The Risk to the travelling public resulting from the services provided in the ANS and Airport Operations is reduced to and remains at a level that is As Low As Reasonably Practicable (ALARP);
c) Risk controls should be described in terms of managing the risks of the system as a whole rather than managing the risks of individual components or hardware/software;
d) Risk controls should be described in ways in which achievement can be measured;
e) Technical performance, maintenance and managerial issues should be incorporated into Safety Risk Assessments where they relate to operational safety; and
f) The Safety Risk Assessment should be carried out by persons with appropriate knowledge and experience and include representatives from all affected areas (internal and external).

8.7.2 Risk Criteria and As Low As Reasonably Practicable (ALARP)

- A key AAI Safety Risk Assessment principle is that the risk resulting from the services we provide remains at a level that is ALARP.

- As this is the basis of our system, it is appropriate to explain the ALARP principle before detailing how we go about measuring and assessing whether risks are ALARP. The ALARP principle is illustrated in figure 8.1 below.

Figure 8-1 Risk Management Process



- The cone is divided into four levels of Safety Risk with the width of the cone representing the magnitude of these risks. There is an upper level of risk that is deemed to be intolerable. If a risk is found to be intolerable, risk reduction measures are essential, regardless of cost, or the system, facility or the service in question must be decommissioned or withdrawn.
  There is a lower level of risk that is deemed to be broadly acceptable. At this risk level (and below), current systems are maintained and monitored and the Risk is periodically reviewed. Further Risk reduction may be made, but only if the cost is insignificant.

The remaining two levels in the ALARP region lie between the upper and lower levels of risk. If Risk falls into this region, it should be reduced as much as is reasonably practicable. Reduction measures must be identified and evaluated in terms of cost and possible risk.

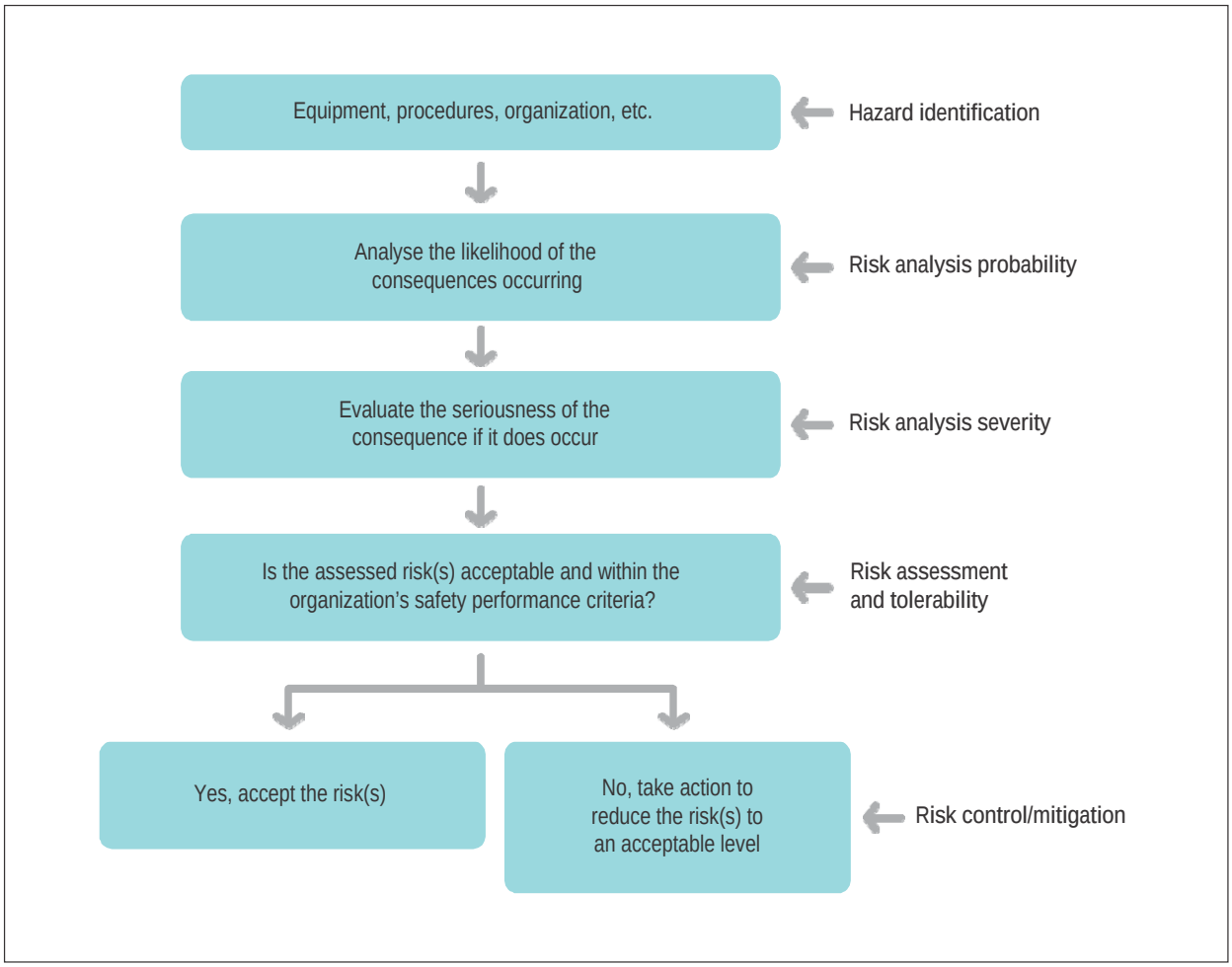
- If the Risk is assessed as falling into the ALARP region, this does not mean that the Risk can be declared as ALARP. The Risk can only be said to be ALARP when it can be demonstrated that all justifiable risk reduction measures have been identified as acceptable and the remaining measures cannot be justified because the costs of further reducing the Risk are far greater than the expected benefit. As this principle requires risks to be reviewed over time, it essentially amounts to conduct of operations in an environment of continuous improvement.
- The ALARP concept was developed in an effort to illustrate societal expectations of infrastructure and industry. It grew out of legal evaluations of accidents, looking back to see what an employer should reasonably have done to prevent people from being injured or loss of life at their workplace.
- The evaluation of the cost/benefit balance should be done by the person initiating the Project.
- For any activity involved in a project, the overall verdict that risk is ALARP, should be based on broad considerations such as:
  - Compliance with relevant codes and standards in design and operation i.e. whether the project is novel or standard;
  - Safety record of similar systems within AAI or elsewhere;
  - Current state of SMS controls;
  - Safety risk assessment results as described in this document.

8.8 The following shall be carried out as part of the Safety Risk management process:

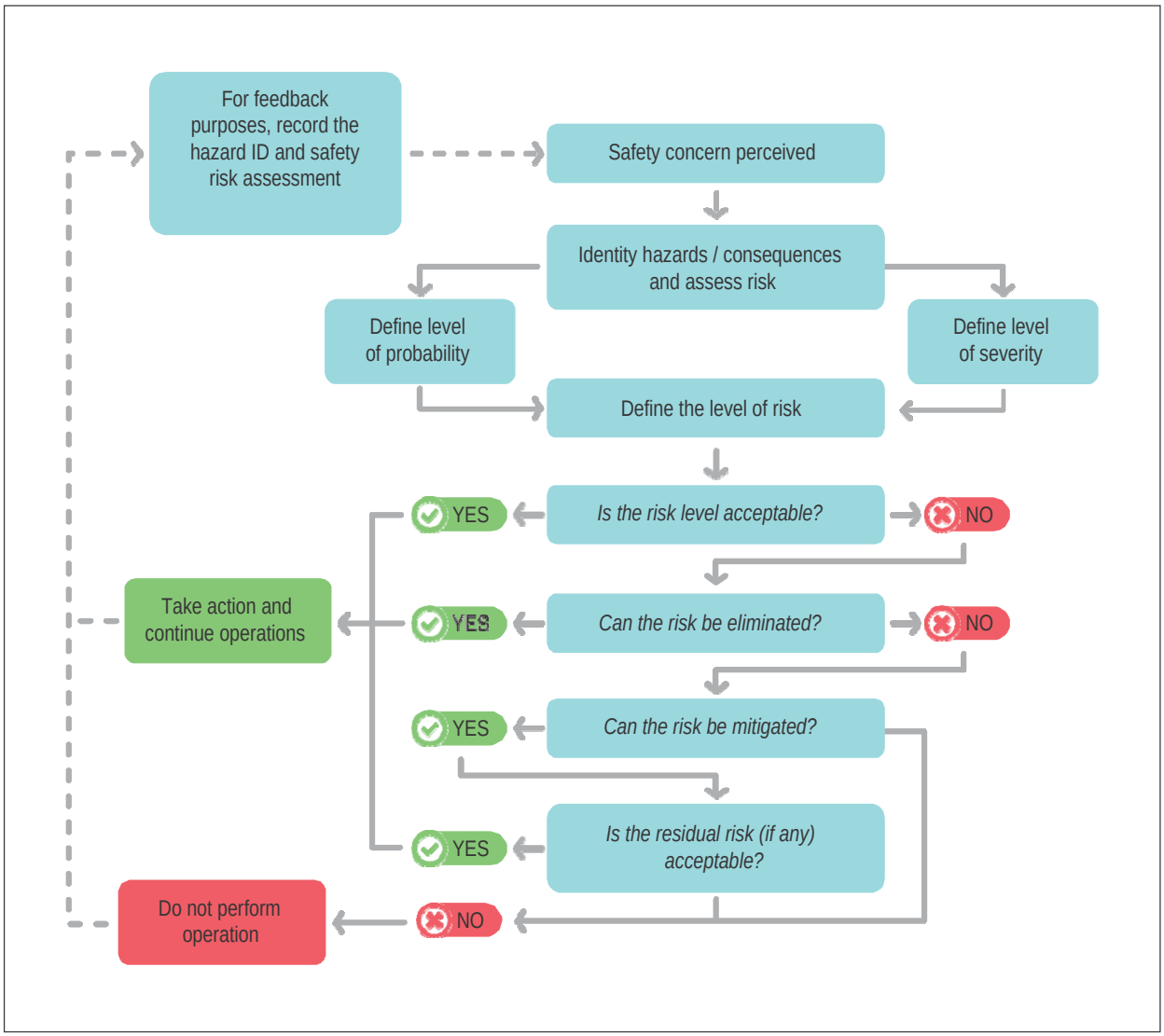
- All changes in Airport operations and ANS that may affect safety of aircraft operations must be assessed for safety;
- All safety assessment activities must be recorded;
- All potential hazards and their consequences must be identified, assessed in terms of probability and severity to determine risk and all risks must be mitigated.;
- All residual risks must be accepted or rejected by the appropriate authority;
- All proposed hazard controls/mitigations measures that are determined to be a 'Safety Requirement' must be implemented and monitored;
- Periodical review of the risks is to be conducted.

- For Minor repairs / changes / very small projects, where it is considered that there shall be no significant safety impact, Formal safety Risk assessments process (SCARS form) may not be required. The concerned project manager/ owners should conduct internal brainstorming to manage change/project safely.

Hazard identification and risk management process



Safety risk management decision aid



8.8.1 Changes and Activities Requiring a Risk Assessment

a) CNS

- Any change which has potential to impact safety;
- Change of category of equipment;
- Changes to operational CNS equipment (including trans installation, re location of navigational aids);
- Changes to support services e.g. maintenance support, electrical supply;
- Change in maintenance philosophy or standards (CHQ) (technical or training/competency);
- Changes to organizational structure or staffing arrangements;
- Major software upgrades;
- Any change which results in changes in functionality or performance (including physical facilities or software based); and
- Activities associated with **Withdrawal / Decommissioning** of facilities systems or services.

b) ATS

- Changes to ATS procedures;
- Changes to airspace structures, routes and procedures (national or local);
- Changes to operational equipment/systems;
- Changes to training/ rating system;
- Changes to performance;
- Changes to organizational structure or staffing arrangements;
- Any change which results in changes in functionality or performance (including physical facilities or software based);
- Any changes which may impact an ATS Units handling capacity; and
- Changes in shift cycle or work environment of ATCOs.
- Aeronautical Information Services (AIS) to minimise the risk of arising from data errors.
- Search and Rescue (SAR) activities in two main steps:
  a) A tabletop review of hazards and risks associated with anticipated operations.
  b) On scene of an exercise, training or operational task.

c) Airports operations

- Any change which has potential to impact safety;
- Change of category in facilities or equipment;

- Changes in a procedure documented in the Aerodrome Manual;
- Changes to organizational structure or staffing arrangements;
- Introduction of new aircraft types; and
- Delivery of major projects.

8.9 When is a Risk assessment done?

Risk assessment for the change process shall be carried out as early as possible and prior to implementation of any change.

Risk assessment is an iterative process and should also be conducted periodically throughout the project life cycle.

Changes must not be implemented until:

- All safety requirements have been implemented; and
- Residual risks have been accepted by the appropriate authority.

8.10 How is Risk Assessment Done?

Risk Assessments should be conducted in accordance with the detailed guidance provided in this chapter.

For new project/change, the Risk Assessment process starts with SCARS form (AAI-SAF-103).

AAI's HAZID form of AAI-SAF-105 should be used to analyze each consequence of each Hazard.

Thereafter all information in HAZID forms shall be transferred in a standard template to create Project Risk Register (PRR) of the project, which will represent the summary / collection of all hazards of the Project.
It should be supplemented by written records on official files as necessary and shall preferably be maintained by the Safety Manager of the airport/ project manager.

During Safety Risk Assessment in respect of Aeronautical Information services, the following requirement shall be considered as safety requirements and shall be taken into consideration as minimum:

- Public availability of most current update cycles applicable to AIP amendments and AIP supplements;
- Data quality with set specification; and
- Aeronautical data exchange formats.

8.11 Who does the Risk assessment?

The one who initiates a Project or Change.
The Directorate (ANS or Operations) proposing a change, or its delegate.

8.12 Who initiates and manages a Safety Assessment of the Project/ change?

- The Process Owner initiates the Safety Assessment of the said project/change.
- Officer(s) as directed by the head of the concerned directorate

Note : As per Technical Instruction 101 dated 21st July 2014 issued by O/o Member (Plg.), for the projects in the operational area, HOD of the Engg. Deptt shall be the Process Owner and the project In-charge will be the Project Manager. It is the responsibility of the process owner and Project In-charge to initiate and resource the necessary safety assessments in coordination with Safety mangers and get approval of proposed change or new project.

However, all communication seeking DGCA approval for airport operational related change/ new project will be through ED(OPS).

8.13 Who must attend Risk Assessment workshops?

- Representative of all affected Units/directorates including the SMEs.
- External stake holders, if affected, by the change.

8.14 Who manages Risk Register?

As a general guidance, the officer who manages the risk register, is the one who has the lead accountability for safety outcomes.

Project/change life cycle phases and the defacto Project Risk Register Managers for the previously identified phases will be as follows:

- <u>Concept, Design & Execution:</u>

  Project Manager

- <u>Transition to Commissioning:</u>

- Joint responsibility of Project Manager and Operational Authority (Operational/Technical Authority must accept risk carried over from design and Execution phase to operational use prior to start of transitioning).

- <u>Post Commissioning/ Operational</u>

Concerned Operational Authority of service delivery units ((e.g. ANS or OPS)

Project Risk registers shall be maintained throughout the life cycle of a project/change. The manager of the risk register may change as a project/change moves through its life cycle.

Finally, when the change is introduced into operational environment, after conduct of Post implementation Review (PIR) all the active hazards of the project phase shall be transferred to HAZLOG (AAI-SAF-127).

8.15 Safety Risk Controls

A Safety Risk Control may apply to any number of hazards; however, it must be recorded independently for each consequence. This ensures the contextual relationship between hazard and control. The effectiveness of the control should be determined appropriately for each consequence.

It is important to specify risk controls as clearly as possible, and in a way that their effectiveness can be measured. Traditional equipment measures include reliability, availability, continuity, maintainability, accuracy, mean time to repair, etc. Be careful to ensure that the measures target real progress towards meeting the total operational safety requirement.

For example, specifying only availability without also specifying a limit on the rate of occurrence of failures, or how quickly the system must be restored, may be unsatisfactory from a safety perspective. A very rare occurrence with a fairly long downtime may be less hazardous than frequent failures with shorter downtimes.

A good way to express a safety performance item in a contract may be:

“The likelihood that… (The failure mode of the basic requirement) …for longer than… (the Allowable time) …must be no greater than… (the likelihood of the event) …”

It is **MANDATORY** that the control be met prior to the activity generating the hazard being placed in to active service.

Control Status

There are three control status. These apply to all controls and are described below:

a) **Yet to be met:** A control that is planned to be implemented, but has not been completed.
b) **Not met:** A control that was considered for implementation, but will not be adopted. Justification for this decision must be entered into the comments/History field. If the control was also a Safety Requirement, the

justification must include the alternative measures taken to control the risk and verification of the residual risk classification.

c) **Met:** A control that has been implemented. How this was achieved must be entered into the Reference field.

When the active hazards are transferred to HAZLOG (AAI-SAF-127), Control status should be mentioned in column "status and completion date".

8.16 Risk Analysis:

An accident or incident rarely results from a single failure or event. Consequently, risk analysis is seldom a binary (e.g., on/off, open/closed, broken/operational) process. Risk and hazard analyses can identify failures from primary, secondary, or even tertiary events.

8.16.1 During the risk analysis phase:

- Evaluate each identified hazard and the system state (as mentioned in the system description) to determine the controls,
- Analyze how the operation would continue, should the hazard occur, and
- Determine the hazard's associated severity and likelihood and providing supporting rationale.

8.16.2 Defining Risk

Risk is the composite of predicted severity and likelihood of the potential effect of a hazard. While the worst credible effect may present the highest severity, the likelihood of this effect is often very low. A less severe effect may occur more frequently and therefore present a higher overall risk than the more severe effect. The ways to reduce the risk for the two effects may be different, and both must be identified. Consider all credible effects and their associated risks in order to identify the highest risk for the safety hazard.

Attempt to obtain and document objective evidence (e.g., historical evidence of similar ANS changes, testing data, modeling or simulation results) to support the assessed level of risk. Use of quantitative data is advisable, If quantitative data are not available, document the research methods—including the data sources reviewed—in addition, to support qualitative assessments. Because different system states can affect both severity and likelihood in unique ways, determine whether the hazard will exist in several system states and assess the risk accordingly.

8.16.3 Safety Risk Probability

- Probability is the chance of the undesired outcome occurring within a specified time frame. The time frame may be over the duration of the project or over a number of years for hazards that are (or will become) part of ongoing activities. Where specific incident data is available it may be used, otherwise workshop-based methods maybe applied wherein the probability is determined based on the experience of the group.
- Note that the severity and probability for each consequence of the hazard must refer to the same outcome.

  The following table depicts the probability classification to be used for qualitative analysis based on service provision.

Safety Risk Probability Table -Table 8.1

Probability	Meaning	Value
Frequent	Likely to occur many times	**5**
Occasional	Likely to occur sometimes	**4**
Remote	Unlikely to occur, but possible	**3**
Improbable	Very unlikely to occur	**2**
Extremely Improbable	Almost inconceivable that the event will occur	**1**

8.16.4 Safety Risk Severity Table -Table 8.2

The purpose of this step in the process is to determine the severity that could result from consequence of the hazard under consideration.

Severity of Occurrence	Meaning	Value
Catastrophic	• Equipments destroyed • Multiple deaths	**A**
Hazardous	• A large reduction in safety margin, physical distress or a workload that operator cannot be relied upon to perform their task accurately or completely • Serious injury • Major equipment damage	**B**
Major	• A significant reduction in safety margins, a reduction in the ability of operator to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency • Serious incident • Injury to persons	**C**
Minor	• Nuisance • Operating limitations • Use of Emergency procedures • Minor incident	**D**
Negligible	• Little consequences	**E**

8.16.5 Safety Risk Assessment Matrix

When the probability and severity of the consequence of the hazard have been estimated using the Table 8.1 and 8.2, the following risk matrix shows the associated risk level ranging from 5A to 1E.
These risks have been divided into four classes from class I to class IV. This classification is used to determine if changes to the risk control strategy are required i.e. if the current controls should be improved or if more controls should be provided.

Safety Risk Assessment Matrix-Table 8.3

Risk Probability	Risk Severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent (5)	5A	5B	5C	5D	5E
Occasional (4)	4A	4B	4C	4D	4E
Remote (3)	3A	3B	3C	3D	3E
Improbable (2)	2A	2B	2C	2D	2E
Extremely Improbable (1)	1A	1B	1C	1D	1E

8.16.6 Risk Category- Table: 8.4

Class	Risk
I	5A, 5B, 5C, 4A, 4B, 3A
II	5D, 5E, 4C, 3B, 3C, 2A, 2B
III	4D, 4E, 3D, 2C, 1A, 1B
IV	3E, 2D, 2E, 1C, 1D, 1E

- It is important to remember that the risk matrix is simply a tool that an experienced person (or group) can use to assist in structuring their experience. It allows risks from various parts of the organisation to be compared on a common basis to

ensure that risks are managed appropriately i.e. that effort, focus and expenditure are targeted to the most appropriate places.

- There are some weaknesses inherent in a process that simplifies complex risk scenarios down to a single probability or severity categorisation.
- The first is in defining the scenario for which the risk is determined. Broad scenarios are likely to have a higher probability, and the probability of a particular scenario can be artificially reduced by subdividing it into parts. For example, a risk that is present evenly over a one-week period could be evaluated on a per day basis reducing the probability by a factor of 1/7; however, this will have no real effect on the original risk.
- Scenarios (operational environment) can have a range of severity depending on the effectiveness of the various controls in place. Usually, there is one particular severity (**the worst credible case**) that is of concern. This is the risk that is plotted on the risk matrix. Sometimes there is more than one case of concern (where there is a second outcome that is less severe, but still significant, which occurs at a higher probability). In this case it is appropriate to
record more than one risk for a particular hazard. The general guideline is to define the hazard to include all cases for which the specific risk controls are the same.

8.16.7 Evaluate Risks Against Criteria

Having established the initial risk level for the hazard, the next stage is to consider is whether we need to treat the risk? Further risk control strategies may be required or preferred in order to reduce risk to a level that is ALARP.

8.16.8 Matrix-Based Risk Criteria

This table describes the actions required for the various classes of risk and the level of sign off required. Operational risks classified using the risk classification matrix (refer table 8.4) must only be accepted by the persons specified in the following table:

Risk Accepting Authority

(pl. refer AAI-SAF-105 form

Class	Risk status	Actions required	Risk Accepting Authority
I	INTOLERABLE and cannot be justified on any grounds. **Risk NOT ACCEPTABLE.**	Take immediate action to mitigate the risk to bring down the risk to acceptable or Stop activity/ project until Risk is reduced.	None

II	TOLERABLE Acceptable in exceptional circumstances	Risk must be reduced further unless the cost of proposed control measure(s) is/are grossly disproportional to the benefits gained.	Concerned Executive Director
III	TOLERABLE Acceptable	Risk must be reduced further unless the cost of proposed control measure(s) disproportionate to the benefits gained.	Concerned General Manager.
IV	ACCEPTABLE.	Maintain current systems, monitor and review. Further risk reduction may be considered. .	Concerned JGM/DGM or APD/CIC/OIC (in case the concerned JGM/DGM is not available at Station.)

Note : Irrespective of fact that the project /change is initiated by Engineering or CNS or any other directorate ,if the impact of the project and safety risk of any Hazard related such project/change affects services of Airport Operations or Air traffic services ,then the Residual risk shall be accepted by concerned Airport Operation or ATS Executive .

Any person approving the risk associated with a particular hazard may add, reject or modify part or all of a hazard, and/or its associated risk evaluation, controls and safety requirements.

8.16.9 Authority to Approve Changes / Accept Safety Assessments

(Refer step 10 of SCARS form - AAI-SAF-103)

Overall Safety Magnitude of Change / Project	Authority to Approve Changes / Accept Safety Assessments
Major	Concerned ED / APD (ED Level)/ RED
Moderate	Concerned GM/ APD (GM Level)/ Concerned GM Region
Minor	Airport Director/ CIC/ OIC/

Note : Irrespective of fact that the project /change is initiated by Engineering or CNS or any other directorate ,if the impact of the project affects services of Airport Operations or Air traffic services ,then the Approval of Changes / Acceptance of Safety Assessment shall be done by concerned Airport Operation or ATS Executive .

8.17 Treat Risks (Guidance Material)

For all identified risks, consideration must be given to additional or improved risk controls as listed below:

- system or facility redesign, modification or replacement;
- process or procedures redesign;
- reliability improvement schemes;
- personnel education or training to avert or deal with the hazards;
- Various controls to improve the availability of resources, or management controls on personnel, facilities, equipment and procedures - these may be “soft” controls (procedures, training, etc.), or “hard” controls such as design fixes;
- Risk controls should be developed to reduce the level of risk to a Class IV level where it is reasonably practicable to do so. The higher the level of risk, the more we should be prepared to do to reduce the level of risk;
- All identified potential controls must be tracked in the HAZLOG database. If potential controls are later found to be impractical, the reasons for this should be documented in the HAZLOG and the person making the decision should be identified;
- Controls should remain identified in HAZLOG for the life of the system, facility or service;
- It is possible to undertake formal numerical **Cost Benefit Analysis** (CBA) to assist in deciding on the appropriate balance between expenditure and risk reduction. CBA requires a numerical estimate of the risk reduction associated with a particular risk control measure;
- The statistical lives saved over the life of the system, facility or service in question and the total cost (capital and operating over system life) can then be compared with a numerical value of a statistical life;
- The level of expertise and the amount of modelling/calculation required for a CBA study is significant and hence such studies are expensive and time-consuming to undertake. In the end the result only provides one more input to the judgement required to determine if risk is ALARP; and
- CBA is more likely to be justified if;
  - The risk to be mitigated is a Class II risk;
  - The proposed risk control measures are expensive;

- The issues involved are complex, making qualitative judgements difficult, but can be modelled mathematically;
- The severity involved is A (i.e. there is potential for fatalities or a large number of serious injuries).

Following the review of additional or improved risk reduction measures, the risk matrix with associated consequence and likelihood tables is used to assess the remaining or residual level of risk.

All risk assessments should be properly approved and endorsed by the appropriate design, engineering and operating authorities. In considering whether it is appropriate to sign off on a particular hazard, managers should consider the following four guiding principles:

- risk limitation;
- risk optimisation;
- risk justification; and
- risk monitoring.

8.18 Risk Limitation

Risk limitation requires that the operational risk exposure is below the target level of safety set as policy. Should initial comparison determine that the risk is greater than the target level of safety, the risk must be reduced.

8.19 Risk Optimisation

Risk optimisation means considering how the likelihood of the consequences of hazard could be reduced, and implementing all reasonably practicable reductions. This includes:

- examining the possible causes of the initiating events to determine how the likelihood of these causes eventuating might be reduced;
- introducing additional recovery measures; or
- examining recovery measures failures to determine how the likelihood of these failures might be reduced

Management then assesses the cost and practicality of each possible control and decides whether or not to implement the controls based on the results of this assessment. All steps must be recorded.

Essential controls to be implemented, once they are agreed, are recorded as System Safety Requirements in the HAZLOG and are incorporated into the SMM and relevant SSMM for relevant units.

8.20 Risk Monitoring

The risk must be monitored to ensure that the risk level is maintained. Implicit in the monitoring is the need to identify the events of interest, parameters, the reporting system, the analysis requirements and the change mechanism.

8.21 Human Error

No matter which technique is used for identifying hazards, special attention should be paid to the potential for human errors of various types. The following table describes slips, lapses, mistakes and violations.

CLASSIFYING HUMAN ERROR		
Error Type	**Description**	**Examples**
Slips	The action is executed in an inappropriate way.	-A GFS officer exceeding the speed limit on the airside operational area. -I did something I shouldn't have done.
Lapses	Failure to perform the required action.	-Leaving a system in "test" after maintenance. -Failing to change radio frequency. -I didn't do something I should have done.
Mistake:	Occur when a course of action is selected (that might be correct in some circumstances), but not in the current circumstance.	
CLASSIFYING HUMAN ERROR		
Erro	**Descriptio**	**Examples**
Rule based	The wrong rule is selected or it is misapplied.	An ATC who normally works on facility A being temporarily at facility B and doing what…
Knowledge based	Occur in novel situations – no stored rules or procedures exist. These errors are problem-solving or analytical errors, where experience or knowledge of the	A GFS officer displaying incorrect markings on an unserviceable part of the movement area.

Violations:	A deliberate decision (for whatever reason) to ignore established safety rules, codes of practice, etc.	Although a previous operator error had reduced reactor power to well below 10 percent of maximum, and despite strict safety procedures prohibiting any operations below 20 percent of maximum power, the combined team of operators and electrical engineers continued with the planned test program. This and the subsequent violations of safety procedures resulted in a double explosion within the core that breached the containment, releasing a large amount of radioactive material into the atmosphere (Chernobyl, 1986).
Routine	Tend to occur on a regular basis.	
Exceptional	Tend to be one off events.	

Both slips and lapses are skill-based errors. This means that the person has formulated the right intention (chosen the correct action to take) but executed it incorrectly. On the other hand, a mistake occurs when the decision or choice of action is incorrect.

The risk control and mitigation strategies vary considerably depending on the error type. Slips and lapses may be caused by high workload or design issues. Mistakes are more likely to be mitigated by training and procedures.

A simple model recognizes the differences in the “normal” error rates between knowledge- based, rule based and skill-based decisions as follows:

If decision is…	**it is generally described as a…**	**with an error rate of…**
Knowledge-based	Mistake	1 in 10
Rule-based	Mistake	1 in 100
Skill-based	slip or lapse	1 in 1000

Chapter 9- Safety Performance Monitoring and Measurement

9.1 Introduction

9.1.1. The ICAO Safety Management SARP introduces the notion of safety performance targets and indicators as a way of measuring the safety performance of a service provider and its SMS.

The term service provider encompasses Air Traffic Service providers, certified/licensed aerodromes, authorized air operators, approved aircraft maintenance organization and that are exposed to safety risk during the provision of their services.

9.1.2. Safety performance monitoring is central to the functioning of SMS. Properly implemented, it will provide an organization with the means to determine whether its activities and processes are working effectively to achieve its safety objectives.

9.1.3. Safety Performance Indicators (SPIs) are used to monitor and measure Safety Performance. SPIs help senior management to know whether or not the organization is likely to achieve its safety objectives, they can be qualitative or quantitative.

9.1.4. It is necessary for an SMS to define a set of measurable performance outcomes in order to determine whether the system is truly operating in accordance with design expectations and not simply meeting regulatory requirements.
Safety performance expresses the safety objective of a service provider, in the form of measurable safety outcomes.

9.1.5 AAI monitors Safety Performance Indicators (SPIs) and corresponding Safety Performance Targets (SPTs) established by DGCA in NASP (National Aviation Safety Plan). These SPIs are in consonance with the AAI Safety Policy and Objectives. Necessary safety data is collected to measure safety performance of AAI on these SPIs.

9.1.6 Safety performance management helps the organization to ask and to answer the four most important questions regarding safety management:

a) What are the organization's top safety risks, that need to be addressed?
b) What does the organization want to achieve in terms of safety?

c) How will the organization know if it is making progress toward its safety objectives?
d) What safety data and safety information are needed to make informed safety decisions?

9.1.7 States and service providers are responsible for ongoing monitoring and management of their interfaces to ensure safe outcomes. The safety risk posed by each interface should be collaboratively assessed by the interfacing entities.

9.1.8 Quantitative indicators relate to measuring by the quantity.

Quantitative indicators can be expressed as a number (X incursions) or as a rate (X incursions per N movements)

For example, if air traffic control records three bird hits in July and five in August, there may be great concern about the significant deterioration in safety performance. But August may have seen double the aircraft movements of July meaning the bird hits have decreased, not increased.

9.1.9 Qualitative indicators are descriptive and measured by quality.

An example of a qualitative indicator for a State could be the maturity of their service providers' SMS in a particular sector, or for a service provider the assessment of the safety culture.

9.1.10 Quantitative indicators are preferred over qualitative indicators because they are more easily counted and compared.

9.2 *Acceptable level of safety performance*

9.2.1 An acceptable level of safety performance for the State can be achieved through the implementation and maintenance of the SSP.

Safety Performance Indicators and targets show that safety is effectively managed and built on the foundation of implementation of existing safety-related SARPs.

9.2.2 The Acceptable Level of Safety Performance (ALoSP) to be achieved is defined in the State Safety Programme, India (DGCA).

9.2.3 India's Acceptable Level of Safety Performance (NASP 2018-2022)

a) No fatal accidents in the Commercial Air Transport operation.
b) Effective Implementation of Safety Performance Indicators and achievement of SPTs .

c) Enhancement of Safety Oversight capability to achieve at least 85% effective implementation

9.3. DGCA has established following eight State Safety Priorities.

1. Airborne conflict
2. Controlled flight into terrain
3. Runway excursions and overruns
4. Wildlife and bird strike
5. Loss of control in flight
6. Runway Incursion and ramp safety
7. Deficient maintenance
8. Aviation Procedures & Documentation

For each **Priority** the following have been developed:

a) Safety Objectives,
b) Proposed safety outcome,
c) Action plan
d) Safety Performance Indicators (SPIs)

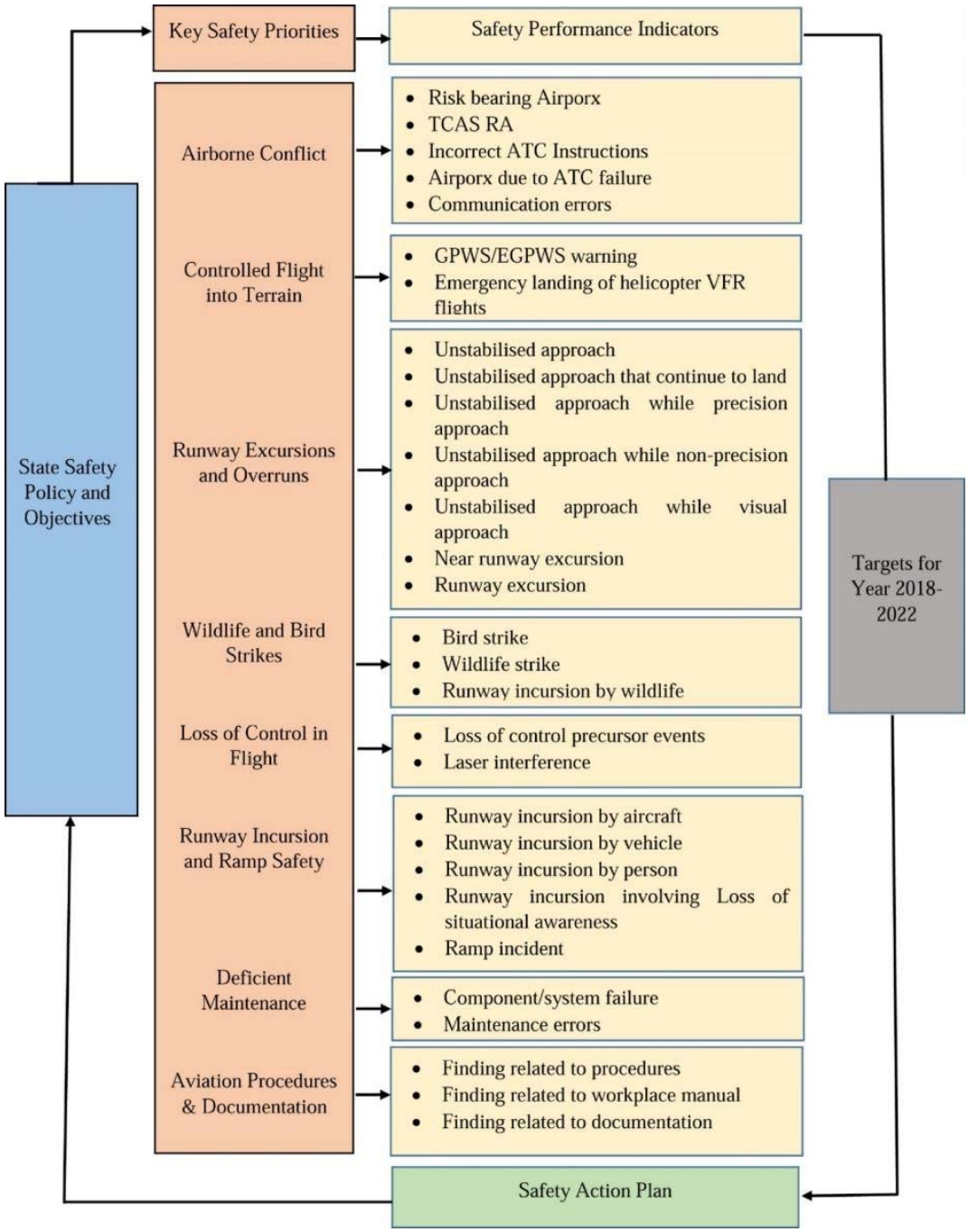
9.3.1 DGCA has defined Lagging Safety Performance Indicators and Safety Performance Targets (SPTs) in its NASP (2018-2022) for ANS (ATM, CNS) and airport Operations.

9.3.2 AAI has developed Leading Safety performance indicators for ANS and Airport operations. AAI monitors the performance of Leading Safety Performance Indicator and Lagging Safety Performance Indicators.

9.3.3. Procedure for setting of SPI in ANS and Airport Operation

The detail procedure for setting up SPI and SPTs are given in AAI-SAF-128 (attached)

Presentation of National Aviation Safety Plan



9.4 Safety Measurement Process

9.4.1 Aviation Safety Directorate collects (from concerned directorate), collates and analyses all safety related data and for disseminating annual safety performance report based on established SPIs/SPTs and safety analysis information throughout the organization.

The sole purpose of safety information dissemination is for improving aviation safety and shall not be used in a way different from the purposes for which it has been collected.

9.4.2 All AAI managed airports shall ensure the entry and submission of the relevant Safety Data at appropriate modules of AIMS.

9.4.3 Source of Data

Aviation Safety Directorate receives aviation safety data in the form of:

- mandatory occurrence reports
- event reports
- confidential/ voluntary reports
- other safety related reports, such as facility failure data
- ORR and PRR
- safety audit /survey reports; and
- stake holders' feedback.

Data from above mention sources is collected from AIMS including Traffic data except safety audit and survey. Traffic data includes total number of Arrivals, departures and over flights. ATM directorate shall ensure that above data entered in correct taxonomy and format.

9.5 *Safety Performance Indicator (SPI) package of AAI*

9.5.1 Safety Performance Indicators (SPIs) of AAI consists of SPIs provided in NASP and SPIs developed by AAI .
These Safety Performance Indicators (SPIs) are aligned with SSP and comprising of both Lagging as well as Leading safety indicators.

Safety Performance Targets (SPTs) of corresponding Safety Performance Indicator (SPIs) is set based on available historical data. Safety Performance Targets (SPTs) are based on percentage of improvement over last year safety performance, as agreed upon by respective directorates.

Aviation safety booklet of SPIs and SPTs of AAI is uploaded by Directorate of Aviation Safety, CHQ in AAI website> AAI employees> Aviation safety for guidance to all AAI airports.

Copy of the annual booklet of SPIs/SPTs will also be submitted to DGCA.

9.5.2 Safety Performance Indicators (SPIs) and SPTs of AAI for 2023 have been established with the consent of DGCA. The Safety Performance Indicators (SPIs) are defined to commensurate with all safety aspects of operational activities of AAI in ATM, CNS and Operations Directorates. See AAI-SAF-128 (Booklet SPIs/SPTs of AAI).

9.5.3 Safety Performance Target (SPTs) are defined for each corresponding SPIs, for which historical data is available. For those SPIs, for which historical data is not available, data is collected for setting SPTs in future.

9.5.4 Three Alert levels are also to be established based on the preceding period's performance, namely average and standard deviation (SD), as defined below. An alert trigger (abnormal/unacceptable trend) is indicated if any of the conditions below are met for current monitoring period:

Three Alert levels are set at:

- average + 1SD – alert level 1
- average + 2SD – alert level 2
- average + 3SD – alert level 3

The performance is considered to be of abnormal/ unacceptable trend if an alert trigger based on the conditions below in monitoring period. Monitoring shall be done for each quarter (based on calendar year).

- Any single point is above the Alert level 3
- 2 consecutive points are above the Alert Level 2
- 3 consecutive points are above the Alert level 1

9.5.5 When Alert is triggered (potential high risk or out of control situation), appropriate follow-up action is expected, such as further analysis to determine the source and root cause of the abnormal incident rate and any necessary action to address the unacceptable trend.

9.5.6 Respective directorate should take appropriate action to enter safety data in AIMS at station level for Safety data collection and processing.

9.5.7 Detail guidance for setting of SPTs & Alert level for corresponding SPIs, based on preceding year performance is explained in SPI booklet, uploaded in AAI website.

9.5.8 SPIs/SPTs booklet (AAI-SAF-128) is a format for annual SMS performance summary. It provides a list of all SMS safety indicators, with respective alert and target level. The performance outcome of all SPIs is to be recorded in the form. Such summary of airports and AAI, may be compiled for each calendar year at the end by 31st January of succeeding year, to provide an overview of the annual SMS performance.

9.5.9 For more quantitative performance summary, appropriate numerical value may be assigned to each Yes, *I* No outcome for each Target and Alert level outcome. This may allow a summary score (or percentage) to be obtained to indicate the overall SMS safety performance at the end of any given monitoring period.

9.5.10 Safety data collected from various sources shall be used only for the purpose of improvement of aviation safety and shall have restricted accessibility.

9.5.11 The compiled safety data after analysis should preferably be stored in Safety Library in electronic data base.

9.5.12 Monthly Safety data pertaining to Safety Performance Indicators (SPIs), shall be entered in AIMS, by all AAI airports, in a standard format as given AAI-SAF-128 (Format for SPIs).

9.5.13 Aircraft movement data, which include departures, arrivals and overflying, should be extracted from Airport Information Management Systems (AIMS).
All AAI airport may set their own targets (SPTs) for SPIs established by DGCA in NASP and SPIs developed by CHQ.
Additionally, they may develop their own **Safety Performance package (SPIs + SPTs) for their airport.**

9.6 Annual SMS performance summary

Annual SMS performance summary is compiled at the end of each calendar year. Summary will be based on respective Target & Alert level outcomes annotated. At the end of given year data, for an SPI, if the average rate for the that year is at least equal to or lower than the set Target, then the set Target of improvement is deemed to have been achieved.

9.7 Safety triggers

A trigger is an established level or criteria value that serves to trigger (start) an evaluation, decision, adjustment or remedial action related to the particular indicator.

One method for setting out-of-limits trigger criteria for SPTs is the use of the population standard deviation principle. standard deviation (SD) is derived based on the preceding historical data of immediately preceding five year (or for available period, if five-year data not available) for a given safety indicator.

The SD value plus the average (mean) value of the historical data set forms the basic trigger value for the next monitoring period. The SD principle (a basic statistical function) sets the trigger level criteria based on actual historical performance of the given indicator (data set), including its volatility (data point fluctuations).

A more volatile historical data set will usually result in a higher (more generous) trigger level value for the next monitoring period.
Triggers provide early warnings which enable decision makers to make informed safety decisions, and thus improve safety performance.

An example of trigger levels based on standard deviations (SDs) is provided at Figure 9-1 below. In this example, data-driven decisions and mitigation actions may need to be taken when the trend goes beyond +1SD or +2SD from the mean of the preceding period. Often the trigger levels (in this case +1SD, +2SD or beyond +2SD) will align with decision management levels and urgency of action.

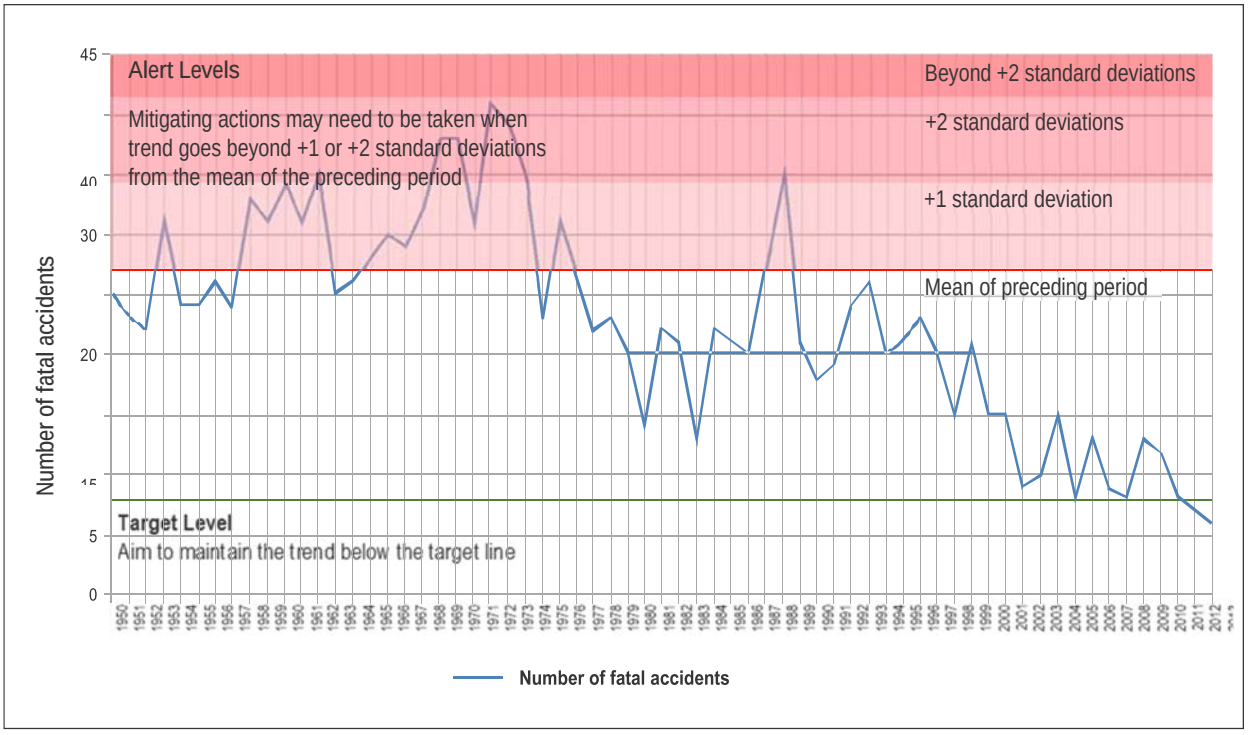


Figure 9-1. Example of representation of safety triggers (alert) levels

It should be noted that trigger values serve to trigger (start) an evaluation, decision, adjustment or remedial action related to the particular indicator. An SPI being triggered is not necessarily catastrophic or an indication of failure. It is merely a sign that the activity has moved beyond the predetermined limit. The trigger aims to attract the attention of decision makers who are now in a position to take remedial action, or not, depending on the circumstances.

9.8 Summary of SPIs and Targets related to ATS and Aerodrome Operations – 2022 & 2023

SPI	Indicator	Actual 2022	target 2023	Target 2024
1. Airborne Conflict				
1.1	Number of risks bearing AIRPROX per 10,00,000 flights over Indian airspace	1.42	2.22	To be established in Jan 2024
1.2	Number of aircraft not or incorrectly complying with ATC instructions (including level bust) per 10,00,000 flights over Indian airspace	20.58	3.05	
1.3	Number of AIRPROX attributable to ATC/ system failure per 10,00,000 flights over Indian Airspace	9.58	9.74	
1.4	Communication Errors	10.0	15.46	
2. Runway Excursions and Overruns				
2.1	Number of 'near' runway excursions per 10,000 Approaches	0.02	0.019	To be established in Jan 2024
2.2	Number of runway excursions per 10,000 approaches	0.02	0.046	
3. Wildlife and Bird Strikes				
3.1	Number of reported birds strikes at all Indian airports per 10,000 movements	5.82	4.93	To be established in Jan 2024
3.2	Number of reported wildlife strikes at all Indian airports per 10,000 movements	0.18	0.198	
3.3	Number of runway incursions by wildlife at all Indian airports per 10,000 movements	0.03	0.019	

4. Loss of Control in Flight				
4.1	Number of Laser interferences per 10,000 movements	0.0071	0.00689	To be established in Jan 2024
5. Runway Incursion and ramp safety				
5.1	Number of runway incursions (aircraft) per 10,00,000 movements	17.02	10.55	To be established in Jan 2024
5.2	Number of runway incursions (vehicle) per 10,00,000 movements	1.55	1.33	
5.3	Number of runway incursions (person) per 10,00,000 movements	1.55	1.52	
5.4	Number of ramp incidents that result in damage to aircraft, vehicles or loss of life/ serious injury to personnel per 10,00,000 movements	1.71	4.976	To be established in Jan 2024

9.8.1 SPIs related to CNS services

Following SPIs are being monitored by CNS directorate.

(i) MTBF of Landing/Navigational aids [ILS (LLZ & GP)/ DME-LP/ VOR-DVOR/ DME-HP/ NDB/Locator/Marker] per year and
(ii) MTBF of Surveillance aids [ADS/ MSSR/ TAR/ RSR/ ASMGCS] per year.
(iii) Number of VCCS (VHF) failures per year and
(iv) Number of degradations in ATS Automation system per year.

The Above SPIs shall be included in AAI's SPI /SPT package for year 2024.

9.9 Phase-wise Implementation of SMS

In compliance with the Annex 19, DGCA has developed Phase wise SMS implementation plan vide Civil Aviation Requirements (CAR) SECTION 1 – GENERAL SERIES 'C' PART I Issue III, 24th March 2022. Airport operator (AAI), ANSP are responsible for the Phase-wise implementation of a Safety Management System (SMS).

The CHQ and Stations are required to complete a gap analysis with SMS regulatory requirements and maintain an SMS Implementation Plan.

Compliance of Phase wise implementation plan & Gap analysis shall be forwarded by all airports to RHQ in the form AAI-SAF-107 & AAI-SAF-109.

Jt. GM Aviation safety(region) shall forward the compiled data of the region to Aviation Safety directorate on or before 30th June & 31st Dec every year.

PHASE-WISE IMPLEMENTATION OF SMS

Timelines for Implementation	At the time of Application for AOP (Phase 1)	At the time of Application for AOP (Phase 2)	+ 18 Months (Phase 3)	+ 18 Months (Phase 4)
To demonstrate	a) Identify SMS accountable executive. b) Establish SMS implementation team. c) Define scope of the SMS. d) Perform SMS gap analysis. e) Develop SMS implementation plan. f) Establish key person/office responsible for the administration and maintenance of the SMS. g) Establish SMS training program for personnel, with priority for the SMS implementation team. h) Initiate SMS/safety communication channels.	a) Establish safety policy and objectives. b) Define safety management responsibilities and accountabilities across relevant departments of the organization. c) Establish SMS/safety coordination mechanism/ committee. d) Establish departmental/ divisional SAGs where applicable. e) Establish emergency response plan. f) Initiate progressive development of SMS document/manual and other supporting documentation.	a) Establish voluntary hazard reporting procedure. b) Establish safety risk management procedures. c) Establish occurrence reporting and investigation procedures. d) Establish safety data collection and processing system for high-consequence outcomes. e) Develop high consequence SPIs and associated targets and alert settings. f) Establish management of change procedure that includes safety risk assessment. g) Establish internal quality audit program. h) Establish external quality audit program.	a) Enhance existing disciplinary procedure/ policy with due consideration of unintentional errors or mistakes from deliberate or gross violations. b) Integrate hazards identified from occurrence investigation reports with the voluntary hazard reporting system. c) Integrate hazard identification and risk management procedures with the sub-contractor or customer's SMS where applicable. d) Enhance safety data collection and processing system to include lower-consequence events. e) Develop lower-consequence SPIs and associated targets/alert settings. f) Establish SMS audit programs or integrate them into existing internal and external audit programs. g) Establish other operational SMS review/ survey programs where appropriate. h) Ensure that SMS training program for all relevant personnel has been completed. i) Promote safety information sharing and exchange internally and externally

Chapter 10 – Safety Related Investigations and Remedial Actions

10.1 Introduction

When an accident or serious incident occurs, the accident investigation process is set in motion to find out any possible failure within the aviation system, the reasons thereof and to generate the necessary counter measures to prevent any recurrence.

Thus, in a safety management environment, the accident investigation process has a distinct role, being an essential process, which investigate and analyze what safety defences, barriers, checks and counterbalances in the system have failed.

Being an important reactive component of the elements contained in the SMS and SSP frameworks, accident investigations contribute to the continuous improvement of the aviation system by ascertaining the root causes of accidents/incidents and lessons learned from analysis of events.

This can support decisions regarding the development of corrective actions and corresponding allocation of resources and may identify necessary improvements to the aviation system including SMS, SSP as well as the State accident investigation process.

While it is common for mandatory State-level investigations to be limited to accidents and serious incidents, a mature safety management environment may provide for the investigation of lower-consequence events as well.

10.2 Safety Requirements

10.2.1 To establish findings and the root causes of accidents/incidents, an effective and comprehensive investigation process includes the identification of and discrimination between ultimate consequence, unsafe event and hazards/threats that contribute to the accident/incident, most investigation exercises also uncover hazards/threats.

10.2.2 The sole objective of the accident and incident investigation process is the prevention of accidents and incidents, in support of the management of safety and not the apportioning of blame or liability.

10.3 Notification of occurrence:

Accountable Executive shall ensure that the information of occurrences as mentioned in chapter 7 are entered in Airport Information Management System (AIMS) in the prescribed format as soon as possible within 24 hours of any incident / accident.

In addition, the information regarding Serious Incident / accident shall also be provided to Aircraft Accident Investigation Bureau (AAIB). Accountable Executive shall develop a procedure for reporting of occurrences and include it in their Safety Management System Manual/Airport Emergency Planning Manual.

10.4 Investigation of Accident/Incidents

Aircraft Accident/Incident investigation shall be done by DGCA/AAIB as per the DGCA CAR section 5 air safety series C part 1 issue II rev 5 dated 10th June 2022 and Aircraft (Investigation of Accident & Incident) Rules-2017, as amended from time to time.

All incidents in the AAI owned airports and sovereign airspace where AAI is providing ANS services shall be reported to ATM, OPS or CNS directorate including Aviation Safety Directorate. The reports will be analysed and if required incidents will be investigated by Directorate of Aviation Safety in order to determine any AAI causal factors (process, procedure and equipment) involved in the incident.

This investigation may be very brief or in details, depending upon the circumstances of the incident. The critical purpose is that the Directorate of Aviation Safety must know what reported incidents are attributable to AAI and those that are not.
Responsibility of implementations of safety recommendation shall rest with concerned directorate.

10.4.1 Initial action

Immediately following a reportable incident, all relevant documents (viz. log book, flight progress strips, meteorological reports/forecasts, etc.) and recordings (viz. VHF/radio transmissions, intercom, ATS surveillance system recording, telephone communications, etc.) relating to the incident shall be preserved for investigation purpose.

10.4.2 Preliminary investigation

A preliminary report about the incident shall be prepared by station in-charge and forwarded to ED (Aviation Safety), in addition to Director (Air Safety)-DGCA HQ, Regional Offices of Air Safety Directorate, DGCA and concerned ED at AAI CHQ within 3 days of the occurrence of the incident.

It shall contain prima-facie facts and shall include the following:

a. Details of aircraft involved (call sign, type, registration marking, operator and place of departure & destination);
b. Full details of the sequence of events in narrative form;
c. statements by personnel involved;
d. Transcript of relevant voice recordings and telephone communication; and

e. Relevant documents (viz. copies of flight progress strips, meteorological reports and forecast and other flight data, including graphical presentation of radar /ASMGCS data).

Preliminary investigation of ATS incidents is conducted as per the procedure laid down in MATS-1 Para 3.20.

Preliminary investigation of CNS incidents is conducted as per the procedure laid down in chapter 7 Para 7.2.4 of this manual.

Preliminary investigation of airport operations incidents is conducted as per the procedure laid down in chapter 7 Para 7.2.5 of this manual.

10.4.3 Investigation of Accident/Incident by AAIB/DGCA

As stipulated in Aircraft (Investigation of Accident & Incident) Rule 2017 & DGCA CAR section 5 Air Safety series C part 1 issue II rev 5 dated 10th June 2022, each incident report received will be evaluated by AAIB/DGCA to decide which occurrence requires investigation by the DGCA or by the concerned Aircraft Accident Investigation Bureau (AAIB)

10.4.4 Investigation by Airprox Investigation Board:

Investigation by Airprox Investigation Board (AIB) will be constituted and notified at all Regional Offices of Air Safety Directorate i.e. Delhi, Mumbai, Kolkata, Chennai and Hyderabad. Teams will investigate all Airprox incidents and any other occurrences as advised by DGCA HQ in their respective regions.

The Investigating Board shall have the following composition:

a) Director Air Safety/Regional Controller of Air Safety or his representative (DGCA) - Convener

b) Joint General Manager / Deputy General Manager (ATM-SQMS) - Member Secretary

c) CNS Representative - Joint General Manager level for occurrences concerning Communication Incidents.

d) As and when required Member AIB may opt any other member if felt necessary. In case Air Force pilots or Air Force ATCO are involved in an incident matter be referred to DGCA (HQ). DGCA (HQ) will co-ordinate for participation of IAF representative in the investigating team.

e) AIB will review all evidence including transcript, DFDR Read out (whenever required), statements of all concerned etc. AIB if required will seek clarification from ATCO, CNS/Airport Personnel, pilots or any other concerned person.

f) After due deliberation by Investigation Team, an Investigation Report will be made by Member Secretary in coordination with the Convener and other members. Investigation Report shall be made as per format.

10.4.5 Investigation of Runway Incursions: Runway incursion incidents are to be reported as per the format prescribed in Appendix A & B to CAR Section 4 Series X Part I. All runway incursion incidents will be investigated by the DGCA.

10.4.6 Investigation of ground handling Incidents/Ground Collision Incidents:

- Vehicular incident not involving aircraft will be investigated by a team consisting of representative from involved airline flight Safety department & Safety Investigation Coordinator/GSD department of the Aerodrome operator.
  The report is to be submitted to Regional Air Safety Department for final acceptance. DGCA may at its discretion order a separate enquiry of any incident.
- Incidents involving aircrafts will be investigated by the respective airlines. Depending upon the injury to personnel / damage to the equipment / aircraft / structure, the investigation will be conducted by Air Safety Directorate (DGCA). The criteria for investigation by DGCA will depend upon the serious injury / fatality or substantial damage to the aircraft and equipment / structure associated with the aircraft

10.5 Post Investigation

Once the report from DGCA has been received and accepted by Chairman AAI, same will be communicated to concerned directorate for implementation of the safety recommendations. The concerned directorate(s) shall

(i) Prepare implementation plan within 15 days, with PDC; and
(ii) Submit Action taken report, after implementation.

10.5.1 Action on Recommendations: -

Investigation report shall contain recommendations based on information derived from an investigation, made with the intention of preventing accident or incident and which in no case has the purpose of creating a presumption of blame or liability for an accident or incident.

Action taken report on recommendations made in the investigation reports shall be submitted by all concerned to Regional Air Safety Offices and Director Air Safety (DGCA HQ).
Wherever required, concerned directorate shall follow the Risk Assessment Process as per AAI-SAF-105, to address the finding on contributary factors, active failure and Hazards.

10.5.2 Procedure for Disciplinary enquiry and Action:

Based on the findings of the investigation by the DGCA/AAIB, if gross negligence, recklessness, illegal activity, willful misconduct or deliberate action is identified against any AAI official, concerned directorate may initiate disciplinary action against the erring official. Disciplinary enquiry/ action may be taken as per AAI, ECDA rules.

10.6 Preservation of evidences and recording media: -

Following an Accident/Serious Incident/Incident/Occurrence, as per DGCA CAR SECTION 5 - AIR SAFETY, SERIES 'C' PART I Issue II, 20TH OCTOBER 2015 rev 5 dated 10th June 2022, to ensure that initial action is carried out at the accident site in coordinated manner and the evidences are preserved, the airport operators shall designate Head of Safety / Head of Operations, who understands preservation of evidences, at each airport called **Safety Investigation Coordinator (SIC)**. He will be the single point of contact in case of an aircraft accident/serious incident /Incident occurring at the airport or in the vicinity of the airport.

SIC in coordination with ATS/CNS in-charge shall ensure prompt sealing and preservation of the recording media, as applicable for the purpose of investigation after an accident/serious incident /incident or any other occurrence as per the direction of DGCA.

10.7 Dissemination of Safety Information to AAI Board:

To ensure that the benefits of investigation are fully realized by AAI, Directorate of aviation safety will present critical Safety issues extracted from the Accidents/incidents investigation report of DGCA & AAIB, audits reports, occurrence reports, internal investigation reports, voluntary & confidential reports etc. to the Chairman and concerned Directorates, periodically.

Chapter 11 - Safety Training and Communication

11.1 Introduction

11.1.1 DGCA CAR on SMS requires that "the service provider shall develop and maintain a safety training programme that ensures that personnel are trained and competent to perform their SMS duties." It also requires that "the scope of the safety training programme be appropriate to each individual's involvement in the SMS." The safety manager is responsible for ensuring that there is a suitable safety training programme in place.

11.1.2 It is expected that AAI personnel with safety-critical roles are trained to the appropriate level and maintain their competency. The Regulator (DGCA) requires that AAI personnel are trained and competent to perform their SMS duties.

11.1.3 The Safety Policy of AAI reflects the commitment to provide appropriately trained and competent personnel, who are able to work at the highest level of safety, efficiency and effectiveness.

11.1.4 Safety promotion encompasses all those activities which the organization carries out in order to ensure that all personnel understand why safety management procedures are being introduced and what safety management means. It is the mechanism by which the organization's safety policy is communicated to all employees. It also provides a means of encouraging the development of a positive safety culture and ensuring that, once established, the safety culture is maintained.

11.1.5 Safety promotion activities are particularly important during the initial stage of implementation of safety management system. However, safety promotion also plays an important ongoing role in the maintenance of safety, as it is the means by which safety issues are communicated within the organization.

11.1.6 Safety culture is seen as an integral part to assure safety and an organizational culture will influence what behaviors are accepted, and behaviors in turn influence performance.

11.2. Safety Training Content (Ref. DGCA CAR section I, series C, Issue III, 24th March 2022)

11.2.1. The training programme should include initial and recurrent training requirements to maintain competencies.

Initial safety training should consider, as a minimum, the following:

a) DGCA SMS related provisions and overview of State Safety Programme

b) Organizational safety policies and safety objectives;
c) Organizational structure, roles and responsibilities related to safety;
d) Basic SRM principles;
e) Safety reporting systems;
f) Interface Management
g) The Organization's SMS processes and procedures; and
h) Human factors.
i) The organizations safety culture

11.2.2 Recurrent safety training should focus on changes to the SMS policies, processes and procedures, and should highlight any specific safety issues relevant to the organization or lessons learned.

11.2.3 The safety training programme should specify the content of safety training for support staff, operational personnel, managers and supervisors, senior managers and the accountable executive.

11.2.4 There should be specific safety training for the accountable executive and senior managers that includes the following topics:
a) Specific awareness training for on their SMS, accountabilities and responsibilities;
b) Importance of compliance with national and organizational safety requirements;
c) Management commitment and safety leadership
d) Data driven decision making
e) Allocation of resources;
f) Promotion of a Safety Policy and the SMS;
g) Promotion of a positive safety culture;
h) Effective interdepartmental safety communication;
i) Safety objective, SPIs, SPTs and alerts levels;
j) Disciplinary policy

11.3 Training and Competency Arrangements

11.3.1 AAI ensures that its personnel carrying out operational or safety-critical roles are appropriately trained, their knowledge regularly updated, competence assessed at regular intervals and that their competency to discharge their duties is assured. The scope of safety training programme is appropriate to each individual's roles in SMS.

11.3.2 To ensure that safety obligations and accountabilities are met, and that safety is not compromised:

- Each Directorate that undertakes activities which may impact efficiency or safety of the Air Navigation Services and Airports operations shall implement a system which ensures that relevant personnel or accountable supervisors are:

- aware of their operational and safety accountabilities
- appropriately trained and competent to discharge their duties; and
- able to work at the highest level of safety, efficiency and effectiveness

- All AAI personnel, contractors, or AAI personnel supervising external workers undertaking activities which may impact the efficiency or safety, shall, prior to commencement of work, be provided with an induction training which at minimum identifies the safety-related considerations of the work, and/or their safety accountabilities.

11.3.3 Safety Management training shall only be imparted by officials who have been specifically approved by Executive Director (Aviation Safety).

11.3.4. SMS Trainer (refer SSP Circular no. 2 of 2023)

(a) SMS trainer is a person who has worked in a capacity of Safety Manager for at least one year and have undergone train the trainer course (Instructor's Training Course (ITC) by AAI/any other instructor's training course by reputed institute)

or

(b) a person who meets following requirements:

(i) Should have undergone train the trainer course (ITC /any other instructor's training course by reputed institute.

(ii)Minimum five years of operational experience in ATC/CNS/OPS

(iii)Minimum five years' experience for implementation of in Safety Management.

(iv) Must have undergone a Safety Management System training approved by Directorate of Aviation Safety, CHQ.

11.3.5 **Training Records: -**The Records of AAI operational personnel trained in Safety is maintained in Aviation Safety Directorate and records of professional training shall be maintained in respective Directorate.

11.3.6 Aviation Safety Directorate has Aviation Safety Training Portal under "AIMS for Aviation Safety Module" wherein all training records are maintained.

The nodal officer of CHQ /RHQ or Airport conducting any Safety Management training should update the training details on this portal on completion of each training and send a mail to ED(AVS) CHQ and GM(AVS) CHQ regarding same.

11.4 Safety Training of Contractor's Supervisor & Staff

11.4.1 Whenever new project in the Operational area/ANS facilities to be started, Project Manager would ensure that **Safety Manager or any AAI personnel, who are trained in Safety Management System** by AAI, CHQ **Conducts**

appropriate SMS training for all the persons working in the Operational Area/ANS facilities before start of work.

11.4.2 All AAI contractors undertaking activities, which may impact upon operational integrity or safety, shall, prior to commencement of work be provided Induction Training, which at minimum identifies the safety-related consideration of work, and/or their safety accountability. This training can be imparted by Safety Manager or any AAI personnel, who are trained in Safety Management System conducted by AAI, CHQ**.**

11.4.3 Safety Manager would ensure that the training material would include relevant example in the training materials and ensure that training materials is provided in local language to the supervisor and labours.

11.4.4 Safety Manager would circulate, Dos and Don'ts in local language to ensure that they are fully aware of the hazards and the safety measures to be taken to ensure safety.

11.5 Safety Training for Accountable Executives / HODs (ATC,CNS, Ops, Engg. and Fire) /SMEs

Duration - Two Days
Contents - All topics to be discussed with examples

- Concept of Safety
- Management commitment, Safety Policies & Safety Objectives
- Safety performance monitoring, SPI/SPTs;
- SMS accountabilities and responsibilities;
- Importance of compliance with ICAO SARPs, National (DGCA) and Organizational (AAI) Safety requirements;
- Safety reporting, Hazards identification and Safety Risk management;
- Management of Change
- Safety communication
- Promotion of a positive safety culture;
- Data driven decision making
- Allocation of resources

At the end of the training, one hour group discussion and Question-Answers Session shall be conducted for assessing the understanding of the topic by the participants.

Frequency - Once

Refresher / Recurrent Training should be conducted after five years, and the contents and duration shall be decided by directorate of Aviation Safety.

Note: - Subject Matter Expert (SME) are the officials who are taking part in the Safety Assessment procedure like HODs of ATM, CNS, OPS, Engg, Airport Rescue & Fire Fighting (ARFF) etc.

11.6 Safety Training for Safety Managers

Duration - Five Days

- Concept of Safety & its evolution;
- Introduction to Safety Management System;
- AAI Safety Policy and Objectives;
- SMS accountabilities and responsibilities;
- Hazard Identification and Risk Assessment;
- Management of Change;
- ICAO SARPs, National (DGCA) and organizational (AAI) Safety requirements;
- Safety Assurance (SPI, SPT and Alert level)
- Safety Reporting;
- AIMS Portal for Aviation Safety
- Safety culture including Positive Safety Culture
- Safety Promotion & Communication;
- Human Factors;
- Procedure for Safety Assessment of any change management;
- Common discrepancies observed during safety assessment documents and
- Safety Audits
- Case studies

Frequency - Once

Assessment procedure: after completion of the training, written examination (one hour) comprising of objective type and short answer questions shall be carried out & passing marks will be 80 percent.

Refresher / Recurrent Training should be conducted after five years, and the contents and duration shall be decided by directorate of Aviation Safety.

11.7 Safety Training at Induction Level (All Executives)

Duration - Two Days

Contents -

- Concept of Safety & its evolution;
- ICAO SARPs, DGCA SMS related provisions and overview of State Safety Programme;

- AAI Safety Policies and Safety Objectives;
- AAI roles and responsibilities related to safety;
- Basic SRM principles; (Hazard Identification and risk Assessment);
- Safety reporting systems;
- Interface management;
- AAI SMS processes and procedures;
- Human factors; and
- Positive Safety culture;

(DGCA CAR section C, part 1, Issue III, 24th March 2022)

Frequency: once

Assessment procedure: after completion of the training, written examination (one hour) comprising of objective type and short answer questions shall be carried out & passing marks will be 70 percent.

11.8 Safety Training of All Operational Personnel

Duration - One Day

Contents -AAI Safety Policies and Objectives
-Hazard identification and Reporting of safety issues
-Safety Risk Management
-AIMS portal for aviation safety

Safety Managers should Organize one-day Safety Management training programs at airport/ stations at least once every Year. Such training may be imparted by the Station Safety Manager/ any senior trained officer. The employees **from CNS, ATM, Engg., Fire & Rescue Services and Ops Directorates shall** attend such program.

Operational Officers / Employees should also undergo refresher program once every five yrs.

Safety Manager shall send the compliance report to Jt. GM AVS of the concerned region.

11.9 Safety Training of Non-Operational Personnel

Duration -One Day

Contents -Basic safety concepts
-AAI Safety Policies and Objectives
-Role and responsibilities in safety management system
- Safety reporting

This training can be imparted by any AAI personnel, who are trained in Safety Management System for Safety Managers conducted by AAI, CHQ.

11.10 Training certificate

The Executives who are in possession of certificate issued by Directorate of Aviation Safety, CHQ shall be considered an Executive trained on SMS.

11.11 Safety Communication

11.11.1 The service provider should communicate the organization's SMS objectives and procedures to all appropriate personnel. There should be a communication strategy that enables safety communication to be delivered by the most appropriate method based on the individual's role and need to receive safety related information. This may be done through safety newsletters, notices, bulletins, briefings or training courses.

11.11.2 Safety communication should flow freely between Safety Manager and operational personnel throughout the organization.

11.11.3 The safety manager should ensure that lessons learned from investigations and case histories or experiences, both internally and from other organizations, are distributed widely.

11.11.4 Aim of Safety communication should be to:-

a) Ensure that staff are fully aware of the SMS
b) Convey Safety-critical information; The service provider determines what information is considered safety critical and the timeliness of its communication.
c) Raise awareness of new safety risk controls and corrective actions;
d) Provide information on new or amended safety procedures;
e) Promote a positive safety culture and encourage personnel to identify and report hazards;
f) Provide feedback to personnel submitting safety report on what actions have been taken to address any concerns identified.

11.11.5 **Safety Communication in AAI:** Airports Authority of India ensures effective communication throughout all levels, sharing information about Safety Objectives and current safety activities and issues. Safety communication flows freely between Safety Manager and operational personnel throughout the organization.

11.11.6 AAI has developed a formal means for safety communication that:

a) ensures personnel are aware of the SMS to a degree commensurate with their positions;
b) conveys safety-critical information;
c) explains why particular actions are taken to improve safety; and
d) explains why safety procedures are introduced or changed.

11.11.7 Communication, both internally and externally, regarding the safety health of our organization, is vital to the effective implementation of the SMS. We must not only communicate but also consult with external agencies and our

customers about the safety concerns, which we identify, in order to take most effective remedial action.

11.11.8 For communication safety policy and procedure, CHQ publishes, C-SMS manual, Aviation Safety Circulars, Aviation Safety Advisory circulars, Annual SPIs/SPTs booklet. Additionally, safety issues, safety audit observations are communicated to the concerned Members, EDs and APDs/CICs through IONs/Emails.

Similarly, APDs/CICs/OICs communicate the local safety issues, safety audit observations to the concerned HODs through IONs/Emails.

11.12 Safety Promotion Activities

Airports Authority of India promotes safety throughout the organization by conducting a number of activities which include:

- Introduction and implementation of Safety Management System and development of SMS Manual at both Corporate Level and Station Level;
- Conducting locally SMS awareness workshops for dissemination of safety process and procedures by Safety Manager of the airport;
- Organizing annual “Aviation Safety Awareness Week” in the last week of November nationally;
- Display of Safety Banners and posters;
- Publishing Aviation Safety Circulars and Aviation Safety Advisory Circulars;
- Publishing safety newsletters and bulletins; and
- Sharing of safety information and best practices among internal and external organization

All personnel of Airports Authority of India must try to assist the organization in promoting a culture which foster safety and actively supporting all activities associated with it. They should also enthusiastically participate in safety promotion activities to enhance safety.

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Chapter 12 – Continuous Improvement and SMS Audit

12.1 Introduction

12.1.1 SMS Audits of ANS, Airport operations and FIU provides AAI management with information concerning the safety status of current scenario and identifies the areas where some improvement may be required.

12.1.2 Directorate of Aviation Safety conducts periodic SMS audits of ANS and Airport Operations followed by Occurrence Analysis and systemic reviews. Information and data gathered from these audits is provided to AAI management and the concerned Directorates for further action, on a regular basis.

12.1.3 SMS audits of FIU is conducted by internal Audit team of FIU as per their SMS manual .

12.2 SMS *Surveillance Activities by Aviation Safety Directorate*

12.2.1 One of the roles of the Directorate of Aviation Safety is to monitor and conduct surveillance of ANS and Airport Operations in AAI.

12.2.2 Surveillance activities are conducted for the purpose of:

a) Providing information to the Chairman and the Board members of AAI of the level of compliance in accordance with legislative and regulatory requirements, together with the level of compliance of the current policy, standards and recommended practices;

b) Adding value to the organization, by providing feedback to locations/units in relation to their level of conformance to the applicable legislation and standards;

c) Assessing the effectiveness of the services being provided together with an early identification of any systemic safety issues; and

d) Evaluating the need for improvement or corrective action.

12.2.3 Safety Audit is one of the proactive means of identifying potential problems before they impact the safety.

12.2.4 The range of surveillance activities conducted by Aviation Safety Directorate includes:

a) Conducting surveillance of day-to-day operations and conducting random inspections;

b) Conducting systemic evaluations;

c) Hazard identification and analysis; and

d) Safety occurrence investigation, analysis and reporting.

12.3 SMS Surveillance Activities by Airport /ANS Centres

Based on the procedure followed by Aviation Safety Directorate, the Station level procedure for conduct of internal Audit, as applicable, should be developed in S-SMS manual of concerned airport/ ANS unit.

12.4 Audit Schedule

12.4.1 The Aviation Safety Directorate at CHQ prepares a National SMS Audit Schedule, in the beginning of every calendar year.

SMS audits of ANS and Airport Operations is conducted by the aviation safety team posted at CHQ and RHQ, in accordance with the national audit schedule which is duly approved by Chairman, AAI.

Additionally, the Aviation Safety directorate may conduct surprise inspection/ unscheduled audits, which may be necessitated by an undesirable trend in safety performance.

Surprise inspection/ unscheduled audits are conducted only on those aspects of operation where urgent corrective action was identified or unexplained increase of safety incidents.

12.4.2 Safety Audit is conducted at all AAI owned Airports, ANS Centers and Civil Enclaves – once in two years but not later than three years.

At Airports where schedule flights have discontinued / or yet to commence, Audits should be conducted at least 6 months after schedule flights resume/start. However, busy Airports with large no. of Non-Schedule flights should be audited as per schedule.

12.5 Audit Scope

Safety audit examines units and facilities pertaining to:

- ATM, AIS, SAR, Provision of Metrological Information Services to ATS
- CNS
- Airport Rescue & Fire Fighting
- Airport Operational areas (AGA & GLF)
- Terminal Buildings and Cargo facilities in direct relation with Aircraft operation**,** and
- Other related areas affecting aircraft operations.
- Contracted activities affecting aircraft operations.
- Implementation of SMS

12.6 Broad aspects/areas for Aviation Safety Audits

12.6.1 Air Traffic Management

- Performance of signal lamp, Binocular, Aerodrome Beacon;
- Performance of ATIS / DATIS;
- Verification of Log Books (HOW / TOW procedures) and entries about whether, incidents,
- Performance of VHF , DSC , VCCS system ;
- Time check / synchronized clock system;
- Alarm system (siren / crash bell);
- Display of aerodrome data / emergency action Chart/ grid map/ obstruction charts/IAL procedures and relevant charts;
- Metrological Information Services to ATS
- Record of Runway inspection
- Availability of documents as per MATS 1, Aerodrome Manual/ MATS-1 & 2/ Relevant SOPs and circulars
- Co-ordination procedures;
- Status Indicator for Nav.-aids/ Landing aids in ATS unit;
- Availability of NOTAMs / AIP/ AIP Supplements in ATS units;
- Emergency frequency / search and rescue frequencies as per ATM circular;
- Communication facilities in ATC units like telephone, AMSS, DSC, Mobile
- Computer with internet (Refer MATS-1), ATS Automation system, etc;
- Training cell – Documents / Training records / Training registers / Training facilities, etc;
- Surveillance Coverage (performance, range and the records maintained for unserviceability)
- Search & Rescue Room and the facilities available for achieving the objectives;
- Staff strength; and
- Documents about Aircraft emergency, bomb threat / unlawful interference / dangerous goods occurrences, natural disaster plan/ SAR Manual/ Various SOPs e.g VVIP Flights/ Previous DGCA/ Aviation Safety Dte. Audit Report and ATRs/ disabled aircraft removal and ATC contingency plan (Communication failure / frequency jammed /emergency separation, etc).

12.6.2. Communication, Navigation & Surveillance (CNS)

- Check the useful life of the facility;
- Critical/sensitive area protection;
- Compliance of power supply including surge protection guidelines
- Availability of inter-units' communication facility;
- Site and fault-cum-history log books and their maintenance;
- Periodic preventative maintenance schedules records;
- AMC and CAMC documents

- Equipment status and serviceability (main/ standby);
- Monitoring system status;
- Remote operation status;
- Alarm system status;
- Media status (Main and Standby)
- Major incidents involving equipment in the past two years;
- System of Recording and responding to the complaints;
- Equipment Manuals availability;
- Test equipment (Availability & Calibration status);
- Training /proficiency records/Infrastructure;
- Flight calibration reports;
- Annual serviceability record, and
- Anti-Hijacking Control Room;
- Equipment Room / Workshop;
- Automation Unit and System;
- Communication Briefing and message room;
- CNS/ATM facilities
- Maintenance of environmental parameters;
- Any other parameters related to CNS facilities.

12.6.3. Airport Operations

- Aerodrome operational area facilities and related information
- Condition of the movement area
- Disabled aircraft removal plan
- Visual aids, markings, signages and obstruction lights;
- Aerodrome vehicle operations procedures
- Emergency plans
- Wildlife/Bird hazard reduction measures and AEMC meeting records
- Building fire plan / water rescue plan (in case of floods or heavy rains)
- AEP procedures
- AOCC
- Runway safety team and Safety Committee meeting records
- Breathe Analysis Process

12.6.4. Aviation Rescue and Fire Services

- Rescue and fire services-building/cargo complex, etc.
- Infrastructure / work environment;
  - housing for fire appliances; and
  - fore court area;

- human resources management;
  - Deployment of staff; and
  - training records– station level / FTC etc.;
- Documentation of co-ordination with different agencies like City fire brigade;
- Assessment of fire crew performance / competency;
- Calibration test for all pressure gauge / pressure regulators;
- Documentation of different activities like Log books, Airport emergency plan, Joint inspection register, etc.
- Fire extinguisher;
- Water supply at fire station;
- Communication facilities;
- Hydraulic Test Machine / compressor for breathing apparatus set /air compressor;
- Personal Protective Equipment /Rescue Equipment;
- Reserve storage of media (water, DCP, foam etc.
- Grid map – Airport and Airport Vicinity Map.
- Crash fire tender;
- Ambulances;
- First aid room;
- Movement area; and
- Terminal building/cargo complex.

12.6.5. Engineering -Electrical/Civil

- General guidelines on scheduled maintenance;
- Electrical hazards;
- Do's and don'ts;
- Static electricity and spark hazards;
- electrical safety tips;
- common misconceptions;
- precautions and procedures;
- electrical shock training;
- safety practices;
- Availability of first aid trained staff to attend to any electricity injury;
- First Aid Box and Artificial Respiratory System
- SOPs of electrical equipment on site;
- electrical safety rules;
- technical instructions, Circulars issued by Directorate of Engineering and guidelines related with safety;

- DGCA CAR Compliance related to Ground lighting systems such as runway light, taxi lights, approach light, PAPI system and apron flood lighting system, etc.
- electrical safety guidelines given in National Building code and Indian Electricity Rules 1956 with latest amendments;
- training on maintenance of E & M installations;
- spares of E&M installations;
- availability of testing instruments;
- functional / maintenance status of the safety devices provided by the manufacturers in the major equipment / systems such as:
  - power transformers, HT / LT breakers;
  - standby generators;
  - conveyor belts;
  - escalators & elevators;
  - passenger boarding bridge;
- earthing system provided in all the locations near terminal building, Nav-Aids, Ground Lighting systems and Power House, etc.;
- lightning protection system provided in all locations;
- air-conditioning system of operational buildings;
- water supply and drainage system around the terminal building;
- maintenance status (Civil) of Terminal Building & allied building and surface condition of runway, taxiway and approach road; and
- any other facilities related to operation and Passenger Facilities is also covered.

12.7. SMS Audit Objectives

Objectives of SMS audits include:

- Identification of operational and system deficiencies which may lead to an incident or accident, or present a hazard to safe operation of aircraft;
- Based on monitoring incident trends, advice management on prevention methods and safety promotion; and
- Checking the SMS maturity level of the airport and ANS facilities.

12.8. Audit Programme

12.8.1 Prior to the audit, the auditee is given at least two week's advance notice with the audit programme, which indicates:

- The Audit team members;
- Date & Duration of the Audit;
- Area/Units to be visited;
- Date and time of entry and exit meetings; and
- Checklists which are used for the Audit.

12.8.2 The audit duration shall normally not exceed four days for major aerodromes and two to three days for other aerodromes, excluding journey time.

12.9 Conducting the Audit

Audit Principle

- The Audit Team shall operate using the following principles:
  - be pro-active and positive;
  - be system-focused;
  - be impartial and examine facts in an objective manner;
  - identify non-conformance with applicable standards and procedures
  - analyze procedures leading to non-conformance;
  - indicate strength and weakness in key areas;
  - provide positive feedback, by highlighting the good points observed during the audit.
  - Identify deficiencies but negative criticism should be avoided as far as possible;
  - provide clear guidelines for improvement; and
  - provide feedback on audit findings
- SMS audits are conducted as per the instructions and guidelines are given herein. The Performa for various Audit activities are attached with this Manual.
- Entry Meeting is held with Accountable Executive (Airport Director/ Station in charge) before commencing the safety audit;
- At the Entry Meeting the Audit Team Leader should briefly present the background of the audit, its objectives, scope and any specific issue shall be addressed by the audit team.
- Exit Meeting is held with Accountable Executive (Airport Director/ Station in charge) after the SMS audit.
- At the exit meeting, the audit team leader should present the audit findings and provide written summary of findings. The meeting should also review major audit observations against relevant rules and regulations and give an opportunity to the auditee to clarify.

Pre-Audit Meeting at CHQ/RHQ

Prior to conducting the audit, all relevant documentation should be studied by the audit team at CHQ/RHQ. The AIP, AIP supplements, NOTAMS, Hazlog, Aviation Safety Issues Database, incidents reports, DGCA pending observations and previous audit reports shall be included in this process. This Pre-audit meeting shall be used in planning the conduct of the audit and in compiling audit checklists

Audit Check-list

- The Audit checklist for each directorate is prepared to cover the audit scope and broad aspects as specified in Para 12.6

- The audit check-lists shall be reviewed preferably by 15th January every year.
- Normally, in the month of December, the current check-list will be forwarded to the concerned Directorates for their suggestions/comments. Based on the suggestions received from respective Directorates and changes in Regulations/System/Procedures, etc., team of Aviation Safety Directorate may review and revise the check-list. The revised draft check-list shall then be submitted to ED (Aviation Safety) through GM (Aviation Safety) for approval.
- The existing check lists are attached as Annexure (AAI-SAF-120). Any revision to the check-lists shall be issued through the Aviation Safety Advisory Circular in the month of January.

12.10 Composition of Audit Team

The composition of the audit team and size depends upon the category of the airport and facilities & Services available.

The Audit team members should be independent of the area being audited. The Audit Team shall be comprised of officers from the different disciplines listed below –

- ATM;
- CNS;
- Engineering (Electrical);
- Ops; and
- ARFS.

At ANS centers/Civil enclaves where AAI does not maintain airport rescue and firefighting services but has limited Fire Fighting facilities installed in ANS units/Terminal buildings, Audit team may not always include officer from ARFF deptt. In such case audit team member from Electrical deptt. shall also check performance of firefighting systems.

Instead of complete team from CHQ or RHQ conducting Audit every time, the CHQ and RHQ Audit teams may include duly qualified and experienced officers from nearby Airports (of the Airport to be audited) in their Audit team. The Audit Team leader should brief the audit policy, procedure and practices and provide the relevant Audit Check List in advance to such external officers being included in Audit Team.

12.11 Qualification of Auditors

The personnel selected to conduct an audit should have practical experience of at least five years in disciplines relevant to the area to be audited, a good knowledge of the relevant regulatory requirements, a good knowledge of AAI's

Safety Management System, and have been trained in auditing procedures and techniques.

Auditor should have undergone the SMS training for safety managers conducted by the Directorate of Aviation Safety.

12.12 Audit Report

12.12.1 The audit report usually includes:

- Details of audit team members;
- Date and duration of audit;
- Units, facility/area audited;
- audit findings;
- Non-compliance /deficiencies observed;
- Recommendations/observations;
- Details of corrective action (RCA) and
- Any outstanding issues.

12.12.2 The audit report should be an objective presentation of the results of the safety audits.

12.12.3 The audit team leader in consultation with the audit team will raise the request for corrective action (RCA) on non-conformances or audit issues.

For the Audits conducted by RHQ teams, the draft audit report, including RCA report shall be submitted by the Audit team leader to Regional Safety Manager and for the Audits conducted by CHQ team, the draft Audit report along with RCA report shall be submitted by the Team leader to GM(AVS),CHQ .

The Regional Safety Manager or GM(AVS)CHQ as the case may be shall finalize the Audit report and RCA in consultation with Team leader /Auditors and forward the Audit report along with RCA to the Airport Director/ CIC /OIC for corrective action within 15 days of the completion of the audit along with the copy to :-

- RED and Regional Safety Manager, (Aviation Safety) of concerned region (For Audits conducted by CHQ Team)
- GM AVS ,CHQ (For Audits conducted by RHQ Team)

Action Taken Report: -

- On receipt of Audit Report, the Airport Director/CIC/OIC shall submit the compiled Action Taken Reports within 15 days to:
- Regional Safety Manager with copy to GM (AVS), CHQ

12.13. Monitoring of the Audit observation

- Resolution of the safety audit observations, including pending observations shall be monitored by Aviation safety Directorate at CHQ and RHQ level.
- Regional Safety Manager are responsible to compile the RCA points and ATRs of all the Audits conducted within their Region either by CHQ or RHQ, directorate wise, for each quarter and forward to ED (AVS) in the AAI -SAF -126 format. The Copy of Quarterly report should also be submitted to respective REDs.
- A consolidated Quarterly report on directorate wise RCAs and ATRs along with comments of Safety Directorate shall be forwarded to concerned Directorates (EDs) by ED (AVS).
- Additionally, a consolidated Half Yearly Safety Report is prepared by Aviation Safety Directorate, CHQ, highlighting the major non-conformities observed in the audit and is sent to Chairman and concerned Members.

12.14 Limitation of the Safety Audit

Undoubtedly, there are benefits from audit activities but there are also a few limitations which must be recognized:

- A Safety Audit cannot review possibly each and every activity and therefore, it may not be able to highlight all the shortcomings in the system; (Audits take 'sample' of the system only); and
- Auditors are not infallible.

12. 15 AIMS - Safety Audit Portal :-

Complete Safety Audit process can also be completed on line on Safety Audit Portal under " AIMS for Aviation Safety" module.

12.16 Audit Terminology

Audit	A systematic and objective review to verify compliance with the provisions of the Chicago Convention or national regulations, conformance with or adherence to SARPs, procedures and best aviation safety practices.
Audit activities	Those activities and procedures by which information is obtained to verify conformance with a SARPs, procedures, etc. Such activities may include interviews, observations, inspections and the review of documents.
Audit findings	The determination with respect to the compliance with the established standards and procedures
Audit report	A standardized means of reporting the audit findings to designated authorities.

Corrective Action	Action to eliminate the cause of non-conformity or other undesirable potential situation.
Non-Conformity	Failure to comply with identified requirement
Observation	Statement of fact made during an audit and substantiated by objective evidence.
Safety Assurance	A component of Safety Management focused on providing confidence that the safety requirements are fulfilled.

12.17. Audit Documents

AAI-SAF-121 to AAI-SAF-126 are to be used for documentation of audit process.

12.18. Safety Surveys

Safety Surveys with the employees and stakeholders on the safety performance of Air Traffic Services , CNS and Airports Operations (including ARFF) services shall be conducted randomly on few airports every year.

Chapter 13- SMS Records Management

13.1 Introduction

13.1.1 The service provider shall develop and maintain SMS operational records as part of its SMS documentation.

***Note**: — Depending on the size of the service provider and the complexity of its aviation products or services, the SMS manual and SMS operational records may be in the form of stand-alone documents or may be integrated with other organizational documents (or documentation) maintained by the service provider.*

13.1.2 This chapter describes the method of storing the SMS-related records and documents like hazard reports, risk assessment reports, safety action group/safety meeting notes, safety performance indicator charts, SMS audit reports and SMS training records

13.1.3 SMS requires that a Document Management system is in place to record operational safety related documents which includes

a) Safety policy and objectives;
b) Safety risk management;
c) Safety assurance;
d) Safety promotion.

13.1.4 Such documentations allow us to define what we do, standardize the services provided and review our SMS performance.

13.2 SMS Documentation

13.2.1 The Safety Management System documentation in Airports Authority of India has been derived from DGCA CAR and other SMS related documents.

13.2.2 Airports Authority of India has developed a Corporate Safety Management Manual, which is uniformly applicable throughout the organization.
All licensed aerodromes, Civil Enclaves and ANS centers shall develop and maintain Station Safety Management Manual. The Corporate Safety Management manual communicates organization's approach to safety throughout the organization while a Station Safety Management Manual shall; in addition, communicate the local safety practices prevalent at the station.

13.3 SMS records management procedure:

SMS (Safety Manager's) Office :-

The Accountable Executive shall establish an SMS office, suitably staffed and with proper infrastructure like Computer with internet, Telephone, Scanner and Printer, Photocopier, Almirah for the safe custody of the records etc. for smooth functioning of the Safety Management.

13.3.1 Following records shall be maintained and made available for internal or external audit purpose at the office of safety manager of airport/ANS Centre.

a) C-SMS Manual & S-SMS manual;
b) Hazard reports;
c) Risk assessment reports;
d) Safety action group/safety meeting notes;
e) Safety performance indicator, Targets, Alert level, charts;
f) SMS audit reports;
g) SMS training records;
h) Minutes of the meeting of safety committee;
i) Minutes of the meeting of runway Safety Programme.

All SMS records should be maintained in Soft Copy in properly secured drives. The Hard copy of records may also be maintained if it is considered necessary.

13.3.2 Records of C-SMS Manual, S-SMS manual and Circulars

The **old versions of C-SMS manual** shall be maintained for at least 5 years after issuance of new Manual by Directorate of Aviation Safety, CHQ.
The **old versions of S-SMS manual** shall be maintained for at least 5 years after issuance of new Manual by respective airport/ ANS Center.

Record of Safety Circulars and Safety Advisory Circulars: - The cancelled or old version of revised Safety Circulars and Safety Advisory Circulars shall be maintained for at least 5 years from the date of revision or cancellation by Directorate of Aviation Safety, CHQ.

13.3.3 Records of Safety Action Group/ Safety committee

Corporate Safety Committee / Regional Safety Committee / Station Safety Committee - Minutes of meetings and decision taken record shall be maintained for the last five-year in soft and hard format at respective locations.

13.3.4 Records of Safety Assessment documents

All safety assessment documents such as SCARS, minutes of the meetings, AAI-SAF-103, AAI-SAF-105, AAI-SAF-127 and other relevant documents

shall be maintained in soft & hard copies by the concerned Airport/ ANS unit / Directorate at CHQ for period until project for which the Safety Assessment was conducted is replaced /redeveloped /recommissioned / revised / modified or decommissioned.

Note : AAI-SAF-127 (HAZLOG) which contains all active Hazards of the station has to be reviewed annually. During Annual review, the Hazards which have been closed or eliminated are to be removed from HAZLOG (AAI-SAF-127) and shifted to station's Safety Library. After Every Annual review, updated HAZLOG shall be maintained for at least 5 Yrs in Hard and Soft Copy.

13.3.5 Record of Safety performance indicator, Targets, Alert level, charts

Lagging indicators and Leading indicators record shall be maintained for last five years. SPTs and Alert level decided and if any breach in Alert level including charts shall be maintained in soft and hard copies for five years. Year wise published SPI/SPTs booklet shall be maintained for last five Years.

13.3.6 Record of SMS audit reports

SMS Audit Report and Action Taken Report of the Audit conducted by CHQ and RHQ shall be maintained for last Five years in Soft and Hard copies at CHQ / RHQ respectively.

13.3.7 SMS training records

a) All SMS Training record of Accountable Executives, Safety Managers conducted by CHQ and Induction level trainings, training of Operational executives conducted by training institutes, other offices, RHQ, Airports etc. (on receipt at CHQ) shall be maintained by Directorate of Aviation Safety at CHQ at least for a period of 7 yrs.

b) Induction level training record shall be maintained by the concerned training institute for last Seven years and yearly consolidated records of training shall be forwarded to the Directorate of Aviation Safety, CHQ.

c) Record of SMS training conducted by Safety manager of the concerned airport shall be maintained by the Safety Manager for Seven years. Training record shall be forwarded to the Jt.GM/DGM, AVS of the concerned region who in turn shall forward the consolidated report of the region to the Directorate of Aviation Safety on half yearly basis.

d) All Safety training records are also maintained on line at AIMS for Aviation Safety Module > Safety Training Portal.

13.3.8 **Records of Confidential/ voluntary Safety report**
All the confidential / Voluntary reports shall be maintained at the station where these reports are received and also should be forwarded to the Jt. GM AVS, Region for analysis and remedial action. All such reports shall be forwarded to CHQ on a quarterly basis for further analysis. Record of these reports shall be maintained for five years at each level of dissemination.

13.3.9 **Record of ORR / PRR :** Operational Risk Register (ORR) and Project risk register (PRR) shall be maintained at the station for at least five years.

13.4 When directed by Govt, MoCA, DGCA ,AAIB , AAI management or any other regulatory/legal body , the record of any SMS related document at CHQ/RHQ/Field station may be retained till the period specified in such instructions.

Chapter 14 – Management of Change

14.1 Introduction

Changes are inevitable as global activities and complexities continue to grow with increase in air traffic. The changes to the system configurations, procedures, organizational structure and roles, expansion of aerodromes have the potential to introduce new hazards and/or modify existing risks.
A key component of SMS is to document the procedure and processes by which the safety impact of change is assessed, hazards are identified and risks mitigated.

The aim is to provide assurance to the organization, the regulator and the public that the risk to operation is As Low As Reasonably Practicable (ALARP).

Safety management practices require that hazards that are a byproduct of change, be systematically and proactively identified and strategies to manage the safety risks of the consequences of hazards be developed, implemented and subsequently evaluated.

Changes may be external to the organization or internal. An example of external change is changes in regulatory requirements. Example of internal change includes management (organizational) changes, new equipment or new procedures.

A critical element of any Safety Management System is the ability of the 'field operators and managers' to assess the possible impact on safety before the change becomes operational.

14.2 Change Management Requirements

14.2.1 The Safety assessment requirements for "Change Management" are applicable to:

a) Services and facilities provided by AAI that may affect operational safety;
b) Organizational changes affecting operational safety;
c) All AAI employees; and Contractors of AAI, who undertake activities, which may directly or indirectly be affecting the safe operations of air navigation services or airport operation.

14.2.2 All changes to ANS (ATM, CNS) and Airport (Airside) Operations of an Airport / Civil Enclave / ANS centers –

- Service levels, Procedures, Equipment or Organizational structure, which will affect the:

  Performance, Function or Technical specification of a system or service or facility and Organizational changes affecting safety accountabilities **must undergo the safety risk assessment process.**

- The detailed list of Changes to ATM/CNS and Ops requiring safety risk assessment process is given in Chapter 8, Para 8.8.1.

14.2.3 Rule 83 (2) of Aircraft Rules 1937 requires that while an aerodrome license is in force, alteration to the landing area or to the building or to the other structure of the aerodrome, which may affect the safety of aircraft operation shall not be undertaken without prior approval of the regulator (DGCA).

As a general rule, for all licensed AAI managed airports, prior approval from DGCA is required for commencement of any work and also for commissioning any project, **except for emergency work or minor repair work of short duration.**

Prior approval from DGCA is also required for commissioning of CNS facilities (refer para 14.9).

Prior approval from DGCA is not required for commencement of any work and also for commissioning any project at Civil Enclaves, however, **conduct of safety assessment at all stages is mandatory.**

Prior approval from DGCA is not required for changes to ATS procedures, systems and Airspace management, **however, conduct of safety assessment at all stages is mandatory.**

14.3 Safety Risk Management (SRM) process: -

The SRM process is an integral part of Change Management process which include the following five activities:

- Describe the system;
- Identify Hazards;
- Analyze Risk;
- Assess Risk;
- Treat Risk and accept residual risk

14.3.1 The organization's management of change process should consider the following considerations:

- Criticality - How critical is the change?
- Availability of subject matter experts. It is important that key members of the aviation community are involved in the change management activities;
- Availability of safety performance data and information. What data and information are available that can be used to give information on the situation and enable analysis of the change?

14.3.2 SCARS form (AAI-SAF-103) must be completed taking into consideration all the four phases of the project life cycle and **shall be completed in the initial stage only once for the complete project life cycle.**

Where a proposed change will not result in any change to the areas mentioned above (refer 14.2.) or the change is of a routine maintenance or administrative nature, the normal routine change process may be used in lieu of the SCARS form.

Where a routine change process is used in lieu of the SCARS, a Safety Statement must be prepared. The Safety Statement must provide AAI management with sufficient information to demonstrate that safety has been considered, and the change presents minimal or no safety issues.

14.3.3 SRM documents submission to CHQ:-

- All the safety assessment documents of change management pertaining to ANS and OPS ** (note the exception below) domain from the stations shall be routed through the concerned Executive Director at CHQ, to Executive Director, Aviation Safety for the safety vetting.
- The Concerned Directorates at CHQ shall review (Complete the step 11 of SCARS form) the Safety Assessment documents submitted by stations for appropriateness of the Hazards identified and their mitigation measures (existing and proposed), the SOPs for implementation / transition, NOTAMs or AIP Supplement etc. and thereafter forward to ED (AVS) for Safety Vetting.
- After, receipt of Safety concurrence from Aviation safety directorate, the safety assessment documents shall get uploaded on eGCA portal by concerned Airport Director / Directorate for DGCA approval (Wherever required).
- In case, DGCA approval is not required, the Safety Assessment documents shall be kept at the station level in soft and Hard Copy for record purpose .

  *Note: ** In order to minimize the delay in seeking approval for all phases of project lifecycle for infrastructure at airside, APD grade-1, 2 and 3 airports will process the safety assessment documents at station level itself and thereafter upload on eGCA portal for approval without sending to CHQ for safety concurrence.*
  However, if the overall safety magnitude of Change is MAJOR, the concerned ED/HODs at CHQ level is required to review the Safety assessment process and sign off at Step 11 of SCARS form. Hence, irrespective of the grade of the APD, if the overall safety magnitude of Change is MAJOR, Airport Directors /Project Owners shall forward the all Safety Assessment documents to concerned ED for sign off before submitting to DGCA through eGCA portal .

14.4 The Project lifecycle:

A project is initiated whenever AAI identifies the need for a new system, facility or service or an upgrade/enhancement to an existing system, facility or service. A project begins with a concept and then proceeds through design,

Execution, commissioning (implementation) to operations phase.

DGCA Advisory circular AD AC No. 01 of 2012 dated 19/12/2012 (revised 27th January 2017) defines these phases as following stages.

Stage I: Concept & Design
Stage II: Execution
Stage III: Commissioning

In addition to above three stages stipulated by DGCA, a **Stage IV (Operational phase)** has been conceived by AAI.

14.4.1 Safety Risk Assessment through the Project Lifecycle

Safety risk assessment must be conducted throughout a project lifecycle. It is important to start identifying the safety requirements and risk controls early in the project lifecycle.

- ***Concept Phase (Stage I)***

This is the phase when the project is conceived. A project or change is conceived when a need is identified.

For example, a project for installing CNS-ATM systems or Runway/Apron etc; work is conceived when a need is felt to improve safety, efficiency and upgrade the airport systems and infrastructure.

The purpose of risk assessment at the concept phase is to ensure that all the risks and hazards arising out of Concept of Operations with their mitigation measures are identified based on the operational objectives and to ensure that all safety risks are managed appropriately from the beginning of the work. The typical technique for risk assessment at the concept stage is Preliminary Hazard Analysis (PHA). The PHA examines the broad functionality of the new system, facility or service, and considers the effects of losses of that functionality on the operating system or service. This enables the setting of high-level safety objectives or safety performance requirements;

- ***Design Phase (Stage I)***

In this phase, the concept is given a shape and structure, in the form of examining the feasibility of the concept and arriving at various options available to develop the project / change and finally initiate the procurement of systems or services as identified in the concept phase.

The purpose of Safety Risk Assessment activities in the design phase of a project is to ensure that the design, addresses safety performance requirements identified at the concept stage and that any new hazards introduced at different sub system boundaries during the design has also been addressed appropriately;

For complex projects, a range of different Safety Risk Assessment studies may be required for various aspects of the project e.g. a numerical reliability study for some equipment components, plus one or more facilitated workshops using

Hazard Identification, (HAZID), Failure Mode and Effects Analysis (FMEA) or a combination of these.

As a guide, the HAZID technique has been found useful in many Air Traffic Control (ATC), Aerodrome Rescue and Fire Services (ARFS), Ground and Flight Safety (GFS) situations and FMEA approach in most others, particularly in technical systems to pinpoint the likely impact on safety as a result of failure anywhere in the system.

It is important to remember that these techniques should be used in design development, not just as an add-on check at the end of the work. Selection of a design solution should be based on the potential for the design to satisfy the safety objectives. In other words, select a design that has the best potential to meet the safety requirements established from the hazard identification activities.

Develop risk controls to reduce the risk to acceptable levels and incorporate these into the design. Record and track the hazards, safety requirements and controls as per the AAI procedures.

- ***Execution Phase (Stage II)***

This is the phase of the project which involves installation, or when actual work under the New project / change is undertaken at the airport.

Hazard identification and risk assessment during this phase is primarily focused on any additional risks associated with implementing the approved design;

- ***Commissioning Phase (Stage III)***

This is the phase of the project which involves transitioning from one phase to the next phase and integration of all phases for final commissioning/ operations. Trial operations of the facility/service will be considered in this phase.

Hazard identification and risk assessment during this phase is primarily focused on new hazards during this phase and any risks identified during the previous phases.

Hazards may relate to:

- integrity of the operating system during transition to operation;
- implementation of the design as intended to assure safe ongoing operation of the original and new system, facility or service. Choose a transition strategy that minimises the safety issues during the commissioning phase. Develop risk controls to reduce the risk of transitioning to operation to an acceptable level.

➢ ***Operational Phase (Stage IV)***

This is the phase when after the commissioning of the project a post-implementation monitoring of system performance and effectiveness of risk mitigation measures is necessary to ensure safe operation of the system. In this phase post implementation review and a HAZID exercise should be carried out to find out any new hazards introduced into the system owing to the commissioning of the new project / change. These hazards will then be managed through the AAI methodology.

These phases are referred to as the project lifecycle.

Note: The Safety Risk assessment of small projects may be combined for Stage I and Stage II.

14.5 Role of Various Directorates, Airports or ANS units

14.5.1 Role of Directorates at CHQ.

- For the projects conceptualised at Corporate Headquarters level, the directorate initiating the Project/ change should complete the safety assessment of the Project/ change at stage I (Concept/Design) of the project lifecycle.
- For other projects, safety assessment of the Project/ change at stage I (Concept/Design) of the project lifecycle should be conducted at station level. This will facilitate ironing out of any vital design/issues at the very initial stage and will avoid complications later.
- Safety Assessment for Stage II, III and IV will be done at station level.
- Except for projects related to or affecting Airport Operations at APD grade 1,2 and 3 Airports, wherein, the Safety assessment documents are submitted directly to DGCA by stations without referring to CHQ, stations shall submit all safety assessment documents to their concerned directorates at CHQ for evaluating the appropriateness of the Hazards identified and their mitigation measures (existing and proposed), the SOPs for implementation / transition, NOTAMs or AIP Supplement etc. The ED/HOD of concerned directorate shall complete the step 11 of SCARS Form - AAI-SAF-103 (Review process) and thereafter forward to ED (AVS) for Safety process Vetting.

14.5.2 Role of Airports/ANS units

- For projects other than conceptualized at CHQ, safety assessment of the Project/ change at stage I (Concept/Design) of the project lifecycle should be conducted at station level.
- Safety Assessment for all project for Stage II, III and IV will be done at station level.

14.5.3 Role of ANS (ATM, CNS) and Aerodrome Operations Directorates at Station level : -

It is the role of the ANS (ATM, CNS) and Aerodrome Operations directorate to resource, conduct the necessary safety assessments, approve the changes and wherever applicable, obtain prior permission of the work from DGCA, by submitting the necessary documents.

The appropriate directorate **(Process Owner- responsible for managing and overseeing the process)** and **Project Manager (Plans, executes and complete the project)** is responsible for:

- Compliance with safety requirements;
- Integrity and quality of safety documents;
- Ensuring required approvals prior to any implementation;
- Ensuring that Risk controls detailed in the documentation are appropriate and in place, reviewed / updated following the project / change implementation.

14.5.4 As per Technical Instruction 101 dated 21st July 2014 issued by O/o Member (Plg.), for the projects in the operational area, HOD of the Engg. Deptt shall be the Process Owner and the project In-charge will be the Project Manager. It is the responsibility of the process owner and Project In-charge to initiate and resource the necessary safety assessments in coordination with Safety mangers and get approval of proposed change or new project.

However, all communication seeking DGCA approval for airport operational related change/ new project will be through ED(OPS).

14.5.5Role of Aviation Safety Directorate

It is the role of the Aviation Safety Directorate to assist other Directorates and to vet the safety assessment process conducted. It is the responsibility of individual Directorates to follow Safety management processes / procedures in their respective domain, to ensure Safety, as prescribed in the SMS manual.
ED (Aviation Safety) is responsible for:

- Safety process Vetting of Safety assessment documents received through the concerned Executive Director at CHQ.
- Reviewing Safety Plans and Safety Cases;

14.6 Time line for s*afety Management process*

The safety management processes relating to a new project / change should commence well in advance so as to ensure timely receipt of approvals from CHQ/DGCA and also to assure proper notification of the project activities through AIS. No project should be delayed for want of safety approvals or due to mandatory notification time.

Execution of the project is normally associated with notification of information through AIS. For major and complex projects affecting aircraft operations, AIRAC AIP supplement should be issued. This would require at least 42 days advance notice (56 days advance notice recommended) after the AIP Supplement is issued.

Another aspect to be considered is that information through AIS can be published only after the execution stage assessment is approved by DGCA. Thus, execution stage assessment should be completed at least 2 to 3 months ahead of the planned commencement of work.

Commissioning of the project would also entail the same processes as mentioned above. Additional documents like CAR compliance checklist and reports of operational trials can only be generated only on satisfactory completion of the work. Notification of the new facility/installation/procedure through AIRAC methodology, if required, will take additional time. However, DGCA Circular AD AC 1 of 2012 rev 3, 19th December 2017, allows airports to act in advance for notification of commissioning of a change / project.

Thus, the project should consider a time gap of around 2 months for actual commissioning of the project after completion of commissioning level safety assessment.

Some activities mentioned above may run parallel thereby reducing the time requirements for the approval and notification processes.

14.7 Safety Assessment steps: -

14.7.1 The SCARS form (AAI- SAF-103) must be completed at the start of change process, to ensure that the safety assessment requirements of the change are identified and the relevant documents are prepared.

14.7.1.1 Determine the overall safety magnitude of the change by assessing the likely impact of the change in terms of size and safety outcome of the change.

14.7.1.2 If the overall safety magnitude is **Minor:**

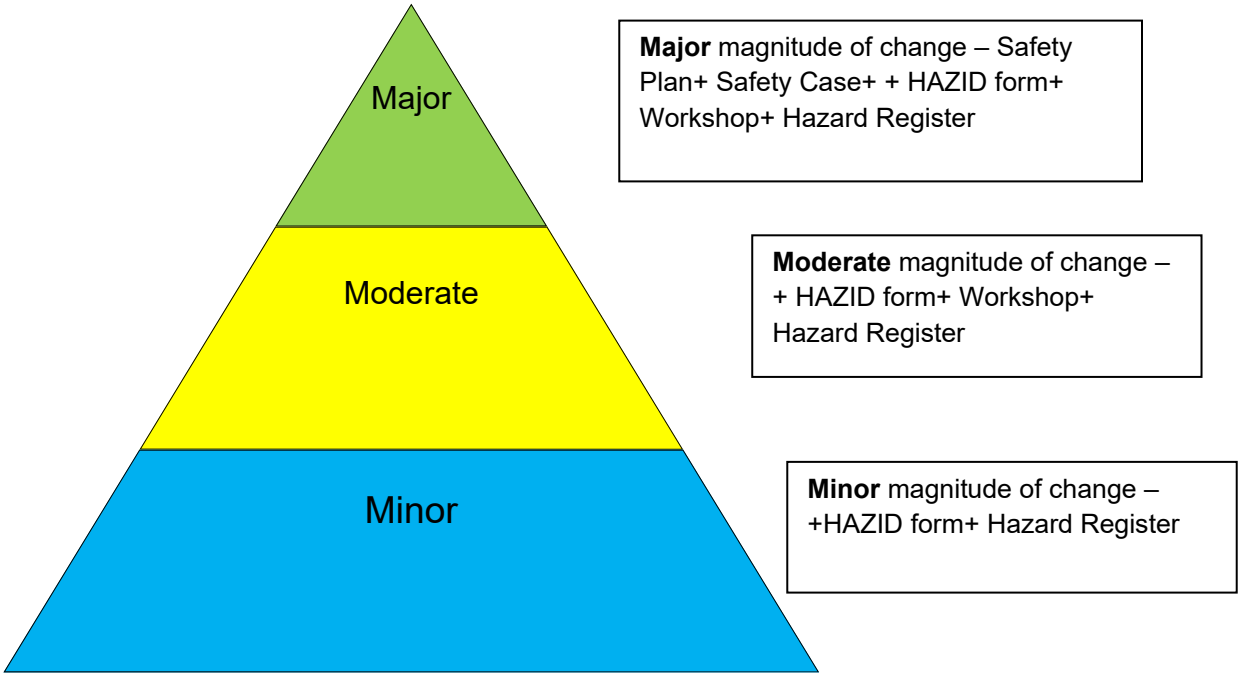
Each Hazard identified in Preliminary Hazard Analysis (PHA) shall be assessed in HAZID form (AAI-SAF-105) and Hazard Register (HAZLOG) must be developed in AAI-SAF-127 (AIMS portal). SCARS Form shall be signed off by the Appropriate Authorities.

14.7.1.3 If the overall safety magnitude is assessed as **Moderate:**

In addition to all steps specified in **Para 14.7.1.2**. and a **separate Hazard identification workshop** (HAZID) shall be conducted to identify more Hazards related with the particular phase of the project lifecycle. Each identified hazard shall be assessed in HAZID form (AAI-SAF-105). A Hazard Register must be developed in AAI-SAF-127.

14.7.1.4 If the overall safety magnitude is assessed as **Major:**

The process shall be completed as given in para 14.7.1.3 and additionally a Safety Plan and Safety Case (refer AAI-SAF-104/A/B) shall be prepared by the Process owner along with the comments/observations of all the stakeholders and submit to concerned directorate of CHQ for (Sign off) acceptance by the concerned ED.



'Over all safety Magnitude of Change'

14.8 Safety Assessment documents check list:-

a) System description including charts and drawings
b) SCARS form (AAI-SAF-103);
c) Minutes of the meeting along with Attendance Sheet;
d) Risk assessment of all the identified hazards (AAI-SAF-105) identified in PHA;
e) In case of overall safety magnitude of the change is **Moderate/Major** conduct a HAZID workshop, record minutes of the meeting, attendance sheet and complete the AAI-SAF-105.
f) HAZLOG (AAI-SAF-127) reflecting the risk mitigation plan;
g) Safety Plan and Safety Case for MAJOR change (either attached with SCARS or separate);
h) AIP supplements/ draft NOTAM if required;
i) SOP/ NOC for height clearance/Maps/Charts (as applicable)
j) Any other relevant documents.

14.9. Requirement of DGCA approval

The for planning, construction & commissioning of changes to airport infrastructure and major maintenance programmes', the Airport Director should

coordinate with DGCA for seeking approval of any change in the following three stages:

Stage-I (Concept / Design level)
Stage-II (Execution level)
Stage-III (Commissioning level)

Safety assessment shall be carried out normally at each phase of the Project/Change lifecycle as detailed in DGCA Aerodrome Advisory circular AD AC No. 01 of 2012, Rev 2, Jan 2017.

However, for small projects, Stage I and Stage II of safety assessment may be combined as per the above mentioned DGCA circular

14.9.1. Document submission to DGCA:

For planning, construction and commissioning of changes to airport infrastructure, and major maintenance programs, (i.e. for Airport Operations project) the following documents should also be attached while communicating the change to DGCA

(refer DGCA Circular AD AC 1 of 2012 rev 2, Jan 2017)

Note: *Wherever, DGCA approval is required for implementing any change or new ANS Project, the similar list of documents shall have to be submitted to DGCA.*

a) (Stage I) - For Concept and design level safety assessment

i. System description including charts and drawings
ii. SCARS form (AAI-SAF-103);
iii. Minutes of the meeting along with Attendance Sheet;
iv. Risk assessment of all the identified hazards (AAI-SAF-105) identified in PHA;
v. In case of overall safety magnitude of the change is **Moderate/Major** conduct a HAZID workshop, record minutes of the meeting, attendance sheet and complete the AAI-SAF-105.
vi. HAZLOG (AAI-SAF-127) reflecting the risk mitigation plan;
vii. Undertaking by accountable executive/ Form for communicating with DGCA (AAI-SAF- 110.)
viii. Safety Plan and Safety Case for MAJOR change (either attached with SCARS or separate);
ix. AIP supplements/ draft NOTAM if required;
x. SOP/ NOC for height clearance/Maps/Charts(as applicable)
xi. Any other relevant documents.
xii. Statement of compliance to DGCA CAR
xiii. A application along with relevant documents for exemption in case there is noncompliance (due unavoidable reasons) with DGCA CAR Sec-4, series B , Part -IV

In addition to above following documents are also desired to be attached (if required)

- Certificate from Engineering Directorate to ensure that building does not:
  - generate wind shear across runway
  - create anomalies in radiated signal; or
  - create light distractions to pilots and air traffic controllers

b) Stage-II - (Execution level)

In addition to documents required for stage I, the following documents have to be submitted to DGCA:-

- Work schedule (execution plan with timelines)
- Details of the area closed for the work including the duration
- Details of the mitigation methods employed to mark the closed area during day and night
- Details of the training/ familiarization given to the contractors/workers/drivers etc.

c) Stage-III - (Commissioning level)

In addition to documents required for stage I & II, the following documents have to be submitted to DGCA: -

- In case there is noncompliance (due unavoidable reasons) with DGCA CAR – a statement confirming that
  - all agreed mitigation measures are in place
  - permitted non-compliances have been reviewed and corrected /removed where possible
  - Certificates (e.g. for frangibility requirements)
  - A statement that all verification activities, including any operational trials have demonstrated that the work has met the technical specifications and will meet the operational objectives.
  - A document certifying and demonstrating that the users/operators of the new, upgraded or replaced/refurbished facility have been adequately trained and competent to operate the facility.
  - New, upgraded, replaced/refurbished facility or system will not compromise the Licensee's safety performance targets agreed with the DGCA.
  - Appropriate notifications for data and facility promulgation have been initiated for applicability on (a specified) date, and that the new, upgraded, replaced/refurbished facility or system will be complete, fully operational and ready for entry into service on that date.
  - There is a plan to monitor safety performance and immediate corrective action, should that be necessary.
  - Evidence for all the above is the subject of documented record and is available for inspection, should that be required.

DGCA may seek additional clarification if required.

14.10 Procedure for commissioning of CNS Aids

14.10.1 Para 7 (Certification) of DGCA CAR Section 9, Series 'D', Part I, Issue II on 'Requirements of Maintenance / inspection of Communication, Navigation, Landing & other equipment installed at Airports and enroute' requires that any new equipment or system procured and installed, by the operator for providing facility as listed below, shall be declared operational only after it is found fit for operation on satisfactory completion of the necessary inspection / checks and calibration to the satisfaction of **the end user,** and after obtaining concurrence/approval of the DGCA for the same.

The requirements stipulated in the Civil Aviation Requirement will apply to all Communication, Navigation and landing facilities including the following:

1. Visual Landing Aids-VASI/PAPI, etc;
2. Approach lighting;
3. Non-Directional Beacon;
4. Locator Beacon;
5. Instrument landing System;
6. VOR/ Doppler VOR;
7. Distance Measuring System;
8. Communication Facilities like VHF and HF Radio Telephone, AFTN, Satellite based Voice and Data Communication System, Direct Speech Circuits, VHF Data Links etc.;
9. Airport Surveillance Radar;
10. Air Route Surveillance Radar;
11. SSR and MSSR;
12. Advance Surface movement Guidance and control system (ASMGCS);
13. Computer based ATC - ADS etc;
14. Airport Recorder and Replay System;
15. GAGAN system and connected equipment;
16. RVR Measuring equipment;
17. Meteorological equipment.

14.11 Safety Plan and Safety Case

Where the outcome of the SCARS indicates that the overall safety magnitude of the change is "Major" Safety Case and Safety Plan must be prepared.

Safety Cases must provide AAI management and the Regulator, when required, with the safety management arrangements necessary to assure the safety of the change.

Refer attachment AAI-SAF-104,104A and 104B for detail guidelines on preparation of safety plan and safety case.

14.12 Control of Contracted Activities

Contractor or external workers undertaking activities which may impact operational integrity or safety, shall prior to commencement of work be provided with induction training which identifies the safety related considerations of the work, and/or their safety accountabilities by concerned Directorate, which is entering into contract.

Detailed contracting procedures for control of contracted activities as mentioned above, should be documented in the section manual of respective directorates and stations involved in this activity.

14.13 Change Management at Unlicensed Airports and Civil enclaves

For areas under the jurisdiction of AAI, all process and procedures for Change Management as laid down in para 14.7, shall be followed and all documents shall be kept for a period as defined by the Document Management System; however, there is no need for seeking prior approval from DGCA before making a change. These documents should be available for examination and records if the aerodrome at a later date decides to obtain Aerodrome License.

Chapter 15 – Emergency/ Contingency Response Plan

15.1 Introduction

15.1.1. This chapter describes the organization's intentions regarding, and commitment to dealing with emergency situations and their corresponding recovery controls. It also outlines the roles and responsibilities of key personnel.

The overall objective of the EMERGENCY /CONTINGENCY RESPONSE PLAN (ECRP) is the safe continuation of operations and the return to normal operations as soon as possible. This should ensure an orderly and efficient transition from normal to emergency operations, including the assignment of emergency responsibilities and delegation of authority. It includes the period of time required to re-establish "normal" operations following the emergency.

The ECRP identifies actions to be taken by responsible personnel during an emergency. Most emergencies will require coordinated action between different organizations, possibly with other service providers and with other external organizations such as non-aviation-related emergency services.

The ECRP should be easily accessible to the appropriate key personnel as well as to the coordinating external organizations.

15.1.2. An emergency is a sudden, unplanned situation or event requiring immediate action. Coordination of emergency response planning refers to planning for activities that take place within a limited period of time during an unplanned aviation operational emergency situation. An emergency response plan (ECRP) is an integral component of a service provider's SRM process to address aviation-related emergencies, crisis or events.

15.1.3. **Air Traffic services** providers must develop **Contingency plans** and **Airports** must develop an **Airport Emergency Plan (AEP).**

15.1.4. The purpose of an emergency response plan is to ensure that there is:

a) an orderly and efficient transition from normal to emergency operations and return to normal operations, as soon as possible;
b) delegation of emergency authority;
c) assignment of emergency responsibilities;
d) documentation of emergency procedures and processes;
e) authorization by key personnel for actions contained in the plan
f) coordination of emergency efforts internally and with external agencies;

g) Safe continuation of essential operations, while crisis is being managed; and
h) Proactive identification of all possible emergency events/scenarios and their corresponding mitigation actions etc.

15.1.5. The Contingency Plans and the Airport Emergency Plans (AEP) shall suit the scope and complexity of the service provider.

15.1.6. Guidance for preparation of Aerodrome Emergency plan including disabled Aircraft removal plan is provided in AD AC no.07 of 2017 (DGCA).

15.1.7. Guidance for preparation of Contingency Plans to deal with Aircraft Accidents is given in Air Safety Circular no. 2 of 1988 (DGCA).

15.1.8. For preparation of Contingency Plans to deal with Aircraft Accidents, reference should also be made to Aircraft (Investigation of Accidents and incidents) Rules 2017 issued by DGCA.

15.1.9. ATS Procedures relating to aircraft emergencies, communication failure, Collision Hazards, Aircraft and ATS equipment failure and contingencies are detailed in Chapter 8 & 15 of MATS-1 (Manual of Air Traffic Services -Part 1)

15.1.10. ATS contingency procedures to deal with public Health emergencies like Pandemic and communicable diseases are mentioned in Chapter 16 of MATS-1, Para 16.11.

15.2 Airport Emergency Plan and Contingency Plans

15.2.1. During any event of major incident, crisis or Accident, the Airport Director and local team shall normally follow the procedures laid down in the Airport Emergency Plan and Contingency Plans.

However, Chairman, Member (ANS), Member (OPS), concerned EDs at CHQ and RED at RHQ may provide necessary directions and guidance to the Airport Director/CIC/OIC for suitable action in event of major incident, crisis or Accidents.

15.2.2. The procedure for notification of incidents to RHQ/CHQ/DGCA is given in the chapter 7 and chapter 10 of this manual.

The procedure of internal notification of incidents for mobilization process has to be defined in the station Airport Emergency Plan and Contingency Plans.

15.2.3. Based on the general procedures specified in DGCA circulars, MATS-1, CNS & Operation Manual and circulars issued on the subject, following plans

have to be developed at Stations/Aerodromes for managing contingency operations:

a) Aircraft Accident
b) Aircraft emergencies (local standby, visibility standby and full emergency)
c) Bomb threat
d) Unlawfully seized aircraft
e) Building fires
f) Disaster management
g) ATS contingencies
h) Disabled aircraft removal
i) Degraded mode of operations
j) ATS contingency procedures to deal with public health emergencies like pandemics and communicable disease events.

15.2.4. Delegation of authority and assignment of emergency responsibility should be documented in the concerned Airport Emergency/Contingency plan.

15.2.5. To be effective, an Emergency/ Contingency Response Plan should:

a) be relevant and readily accessible to all relevant personnel and other organizations where applicable;
b) be appropriate to the size, nature & complexity of the organization;
c) include checklists and procedures relevant to specific emergency situations;
d) have quick reference contact details of relevant personnel;
e) be regularly tested through exercises; and
f) be periodically reviewed & updated when details change.

'Checklists' and 'Training & exercises' shall be an integral part of Emergency response manual.

Periodic review and exercises shall be carried out by Airports to test the adequacy of the plan.

15.3 Plans for Unusual Occurrences

Additionally, the following plans, procedures or Standard Operating Procedures (SOPs) may also be developed, depending upon the local conditions prevalent at the field station or airports:

a) Runway safety programs;
b) Aircraft and airport emergencies;
c) Equipment faults and their restoration time;
d) Routine maintenance of equipment;
e) Scheduled construction and major maintenance in operational area;

f) Minor airside maintenance;
g) Emergency maintenance work; and
h) Low visibility procedures.

15.4 Contents of Airport Emergency Plan

An Emergency Plan would normally be documented in the form of a manual that sets forth the responsibilities, roles and actions of various agencies & personnel involved in dealing with specific emergencies.

AEP should be developed taking into such consideration the following aspects:

a) Governing policies
b) Organization role & directions
c) Notification of emergency
d) Initial response
e) Additional assistance
f) Emergency management center (EMC)
g) Records
h) Accident site
i) News media
j) Formal investigation
k) Family assistance (ICAO circular 285)
l) Post occurrence review

15.5 Operational Control Room at CHQ

An operational control room has been established at CHQ and works under Member (ANS) and Member (Ops) to deal with exigent situations and other unusual occurrences. It is normally activated on the instructions of the top management. However, it functions round the clock to gather the following information

a) Unserviceability report of aerodrome/CNS/Met facilities;
b) Delayed flight reports; and
c) Aviation Safety Sensitive Events.

The following facilities are available at the Operational Control Room:

a) Auto telephone Nos. 24610843 without STD/ISD
b) Auto telephone no. 20818211 with STD
c) Fax machine with auto telephone No. 24693963 with STD/ISD
d) Email: opsctrl@aai.aero
e) Mobile :9650391859
f) EPABX no: 2319

15.6 Rescue Coordination Centers (RCC):

Airports Authority of India has established four Rescue Coordination Centers (RCC) at Delhi, Mumbai, Kolkata and Chennai. A rescue sub center (RSC) of Kolkata RCC has also been established at Guwahati.

RCC is responsible for coordinating the conduct of search and Rescue operations with in a search and rescue region.

Each coordination center is staffed 24 hours a day by trained personnel.

Detailed information about search and Rescue setup and procedures are given in MATS-1 Chapter 3 para 3.7 and ATMC 8/2018.

VOLUNTARY / CONFIDENTIAL REPORTING FORM

(FOR REPORTING SAFETY HAZARD OR UNSAFE EVENT)

The information supplied in this form will only be used to enhance safety. ***You may choose to not provide your details****. If you do provide the details, your name and other details will be removed upon receipt of this form. Under no circumstances will your identity will be disclosed to any person or to any other organization, agency without your permission.*

VOLUNTARY REPORTING: - Please complete Part 'A' of the form and drop it in the box. You may also send your report to Safety Manager of your airport.

CONFIDENTIAL REPORTING: - Please complete Part 'A' of form and mail to concerned APD /CIC/OIC or to ED(AVS) at edas@aai.aero. Alternately, you may submit your report by post, in a sealed envelope to APD/CIC/OIC or to ED(AVS), CHQ.

PART A

TO BE COMPLETED BY THE PERSON IDENTIFYING THE HAZARD

(Please describe the Hazard / Unsafe Event)

Date of Occurrence: _____ Time: _____Location: _____

Description_____

_____

_____

_____

Assessment by the Reporter

In your opinion, what is the probability of a similar occurrence happening again?	What do you consider could be the worst possible severity if this occurrence did happen again?
• Frequent • Occasional • Remote • Improbable • Extremely Improbable	• Catastrophic • Hazardous • Major • Minor • Negligible

_____

Details of the Reporter (Not Mandatory)

Name_____ Position_____

Organization_____ Phone No._____

Email_____

(Please note that feedback will be provided only if your contact details are provided to us)

PART B

TO BE COMPLETED BY THE SAFETY MANAGER

Unique Hazard identification Number: _____
Hazard Description: _____
_____

Major Consequence:
_____
_____
_____
_____

Existing Controls (Defenses):_____
_____
_____

Risk Probability ☐ Risk Severity ☐ Risk Index ☐ Risk Class ☐

Proposed Controls (Defenses)
_____
_____
_____
_____

Referred for further action to:_____

Appropriate Feedback given to the report: YES/NO

Signature: _____ Date: _____

Name_____

DE-IDENFICIATION RECORD

Unique Hazard Identification Number: _____ The report has been de-identified and entered into the Airport Risk Register.

Signature of Safety Manager: _____

Safety Case Assessment and Reporting System (SCARS)

Introduction: -

SCARS (Safety Case Assessment and Reporting System) is the methodology used by AAI to assess the overall safety magnitude of any change or new project. This is in conformance with DGCA Circular AD AC 1 of 2012 revision II, January 2017.

The SCARS form must be used to assess permanent as well as temporary changes to service levels, procedures or equipment, which will affect the performance, functional or technical specification of a system, facility or service and for organizational changes affecting safety accountabilities.

This form must be completed by the Process owner /Project manager possessing specialist knowledge about the proposed change with inputs from other group members (stakeholders) through a process of discussion and then be reviewed and approved by the appropriate Manager.

Where a proposed change will not result in any change to the items mentioned in Section 8.8.1 of C-SMS Manual, or the change is of a routine maintenance or administrative nature, the routine change process may be used in lieu of the SCARS Form.

This form must be used to determine the overall safety magnitude of a project/change and the type of safety report required to be produced and the associated requirements for sign-off acceptance. This completed form is NOT a safety assessment report but the first step in the safety analysis of change.

This form shall be completed considering all the FOUR Phases (Concept + Design, Execution, Commissioning and operation phase) of the Project Lifecycle and should be filled up once only at the initial stage.

Project Number	File Number

Project Title	
Location	**Unit**

Description of the Project / Change	Refer Note below for completing the description of the project/change Signature Name and Designation Process Owner / Project Manager

Note:- The following guidelines should be used for project/change description :-

a) Reference of communication from CHQ /RHQ /APD /CIC/OIC /HOD for initiating the project.
b) Details of the project / change, including Historical background (if any)
c) Objective of the project.
d) Details of new equipment /system/procedure /Airspace structure /Infrastructure / Hardware /Software (as applicable)
e) Attach Map / layout/ block Diagram / Drawings / Chart related to project preferably with dimensions (as applicable)
f) Reference of Applicable standards or regulations (ICAO /DGCA / AAI /Any other)
g) Reference of applicable approval / clearance -Such as WPC clearance/ BCAS / Fire NOC / Electricity authority / Permission for working in Ops Area [PERCOW] etc.
h) Reference of NOC for Height Clearance (if applicable)
i) Reference of Frangibility compliance (if applicable)
j) Details of operational characteristics such as Frequency / Communication links / coverage /range/accuracy/angle setting/ update rate etc. (if applicable)
k) Details of impact on existing Procedures/Systems / Airspace /LOA etc. (if any)
l) Details of impact on interface among Units/ systems / Services (if any)
m) Reference of Draft SOP/Instructions for Trial Operations / Parallel Ops / Transition plan / Implementation plan (as applicable)
n) Reference of Draft SOP/Instructions for Restricted Ops / Plan for degraded mode Ops and failure etc. (as applicable)
o) Project Duration /Planned date of Implementation / Phase wise plan (as applicable)
p) Reference of Draft AIP Supplement / NOTAM (if applicable)
q) Brief of Training plan (if applicable)
r) Any other useful info.

Step 1: Assess the SIZE OF THE CHANGE

Complete the following questions to determine the size of the change. For each question, choose a rating from 1 to 7 as defined below and provide justification.

1 – Extremely Low; 2 – Very Low; 3 – Low; 4 – Moderate; 5 – High; 6 – Very High; 7 - Extremely High

NOTE: These questions are not definitive and are aimed at providing a generalized framework for the initial assessment of the overall safety magnitude of the proposed change.

No.	Description	Ratings
1	**Assess the significance (scope/scale) of the project/change within AAI.** Consider the number of work areas affected: ATM, CNS, Airport Airside Operations, ARFS, etc.	1 2 3 4 5 6 7
Justification:		

2	**Assess the significance of the project/change outside AAI.** Consider the number of service users and/or stakeholders affected, including the interfaces between these parties, e.g. government departments, customers and other ANSPs.	1 2 3 4 5 6 7
Justification:		

3	Assess the level of new functionality introduced/removed, by the proposed project/change, as opposed to the existing system, facility or Service. Does the new system enhance/reduce existing functionality or Provide different functionality?	1 2 3 4 5 6 7
Justification:		

4	**Assess the safety significance of the systems, facilities or services affected by the project/change?** Consider for example systems, communication systems, data systems, AFTN, Runways, Taxiways and any organizational systems such as safety reporting etc; (People/Procedures/Technology)	1 2 3 4 5 6 7
Justification:		

5	**Assess the training component associated with implementing the Project/change?** Consider type of training required, classroom or simulation, time lines, resources, recency	1 2 3 4 5 6 7

Justification:		
6	**Assess the complexity of the transition from the existing System, facility or service?** Consider resources available, documentation, time lines, approvals, contingency arrangements, organizational changes, multiple locations etc.	1 2 3 4 5 6 7
Justification:		
7	Size of Project/Change Rating. Total the scores from questions 1 to 6 and compare to the values below.	**TOTAL**
	Select the resultant size.	
Small =	Medium = 19 to 30	Large = 31 to 42

Step 2: Assess the SAFETY OUTCOME OF THE CHANGE

To assess the safety outcome of the project/change, conduct a **preliminary hazard analysis (PHA)** to determine the likely hazards that may result from the project/change and complete the table below. Considering the effect of consequences of the likely hazards with existing Controls, assign the ratings from 1 to 7 [1 (No effect), 2 (little effect), 3 (Some effect), 4 (reasonable effect), 5 (high effect), 6 (very high effect), 7 (extremely high effect)], estimate the Safety Outcome as Minimal, Reasonable or Substantial and enter this below

Hazard (as defined in Doc 9859):

A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

Hazard no	Hazard Description	Consequences of Hazard	Existing Controls	Assign Rating based on effect on Safe operations with existing Controls							Brief justification for assigning Rating
Hazard 1				1	2	3	4	5	6	7	
Hazard 2				1	2	3	4	5	6	7	
Hazard 3				1	2	3	4	5	6	7	
Hazard 4				1	2	3	4	5	6	7	
Hazard 5				1	2	3	4	5	6	7	
				TOTAL:							

Total score / **(7x No. of Hazards)** **x 100** **= *xxx*%**

Safety Outcome Result:

Substantial: 73% or more
Reasonable: 45% - 72%
Minimal: Up to 44%

List all persons assisting in the analysis process:

Must include representatives from all significant Stakeholder Groups (eg ATM/CNS, GFS, Aviation Safety)

Name:	Position:	Signature with Date:
Name:	Position:	Signature with Date:
Name:	Position:	Signature with Date:
Name:	Position:	Signature with Date:
Name:	Position:	Signature with Date:

Enter the estimated Safety Outcome of the change.	Result:

Equation for Percentage:

Step 3: Assess the overall Safety Magnitude of the change

The Overall Safety Magnitude of the Change is a combination of the size of the change and the safety outcome of the change. Apply the results obtained from Steps 1 and 2 to the matrix below and tick the appropriate box to determine the Overall Safety Magnitude of the Change.

Overall Safety Magnitude of the Change			
Overall Change Magnitude	**Safety Outcome of the Change**		
Size of the Change	**Substantial**	**Reasonable**	**Minimal**
Large	Major ☐	Major ☐	Moderate ☐
Medium	Major ☐	Moderate ☐	Minor ☐
Small	Moderate ☐	Minor ☐	Minor ☐

Step 4: Safety Reporting Determination

Tick the box in the table below to indicate the type of safety report to be prepared for the change.

Overall Safety Magnitude of Project/Change	**To be completed …..**
Major ☐	Safety Case + Safety Plan + HAZLOG + HAZID Workshop + HAZID Form
Moderate ☐	HAZLOG + HAZID Workshop + HAZID Form
Minor ☐	HAZLOG + HAZID Form

Step 5: Safety Statement

Name:	Position:	Date:

Statement:

I confirm that using the processes described above I am satisfied that the proposed Project/change is of Major/ Moderate/Minor safety magnitude. I am satisfied that the safety implications of the proposed change will be identified and adequately addressed in accordance with AAI's safety management and project management procedures.

Signature: Process Owner/ Airport Director/ CIC/OIC

Note: At Airports /CE/ANS centers, APD/CIC/OIC shall sign the safety statement. However, at CHQ/RHQ etc. where APD/CIC/OICs are not available, the Process owner shall sign the safety statement.

Step 6: Project Risk Register

Register Title:	
Dated	
Location:	
Unit:	

Step 7: Safety Case (For Major change) Required Tick box

Preparation of Safety Case assigned to:

Name:	**Position:**	**Signature/Date:**

Step 8: Sponsor

To be completed by the Process Owner or Project Manager, who initiated the change?

Name:	**Position:**	**Signature/Date:**

Step 9: Certification

To be completed by the Safety Manager who facilitated the Safety Assessment.

I certify that the Safety Assessment was conducted, fulfilling the requirements of the SMS.

Name:	**Position:**	**Signature/Date:**

Step 10: Approvals

To be approved by :- Overall safety magnitude of Change/project

Concerned ED (ATM/CNS/OPS) or APD (ED level)/ RED - Major
Concerned GM (ATM/CNS/OPS) or APD (GM level) - Moderate
Concerned JGM/DGM (ATM/CNS/OPS) or APD - Minor

Note :- In case appropriate level officer of concerned directorate (ATM, CNS or OPS) is not available at station, appropriate level APD should accord the approval . However, if approving authority of appropriate level is not available at Airport, the document should be sent to RHQ /CHQ as applicable for approval.

I approve the change and accept the Safety Assessment.

Name:	**Position:**	**Signature/Date:**

Step 11: Review (In case of Major change)

The Safety assessment process has been reviewed and agreed by concerned ED/HOD at CHQ:

Name:	**Position:**	**Signature/Date:**

GUIDELINES FOR COMPLETING SCARS FORM

This form must be used to determine overall safety magnitude of a project / change and type of safety documentation required to be produced and the associated requirement for sign-off acceptance.

SCARS form must be completed taking into consideration all the four phases of the project life cycle and shall be completed in the initial stage (i.e. Concept /Design stage) only once for the complete project life cycle.

1. SCARS Form

1.1 The first page of the SCARS Form gives details about the project. The various fields are as follows:

- **Project Number**: The Project Manager will allot a number to the project and the number will be entered in this field.
- **File Number**: The file number pertaining to the project will be entered in this field. This number along with the project number will be reference number for all correspondences regarding the project.
- **Project Title**: A short title of the project will be entered in this field.
- **Location**: Name of the airport / site (for off-airport sites) should be entered
- **Unit**: Section to which the process belongs (ATM / CNS / Airside Operations)
- **Description of the Project / Change**: A description of the project or change should be entered in this field .Refer note below the Description box for project description.

1.2 Step 1 of SCARS Form helps to assess the size of the change.

There are six questions to be answered by the persons participating in the meeting for completing the SCARS Form. The following guidelines are given to help the participants in reaching the correct conclusion regarding the size of the project / change:

- The questions have a 7-point rating scale, with ratings **1** for Extremely Low; **2** for Very Low; **3** for Low; **4** for Moderate; **5** for High; **6** for Very High; and **7** for Extremely High.
- The correct method **is not** to collect participants' individual ratings for each question and then average it out. Each question should be discussed among the participants and a consensus rating reached which is adequately justified. The rating along with the justification should be entered under each question.
- Since SCARS Form will be filled up only once (at the start of the project), each of the six questions should be rated considering all four phases of the project, viz. Concept, Design, (Execution, Commissioning) and Operation phases.
- ***Question 1*** is ***Assess the significance (scope/scale) of the project/change within AAI.*** In order to help the users in answering this question, SCARS asks them to consider the number of work areas affected (ATM, CNS, Airside Operations, ARFF etc.) and also to consider disciplines, systems, locations, business processes and organizational structures. All such work areas, locations and processes that are affected by the proposed change during all phases of the project should be considered. **More the affected areas, higher the rating.**
  For example, installation of ILS at an airport will involve ATM, CNS, Airside Operations, and Civil and Electrical personnel at the airport. Additionally, when we consider the concept and design phases, personnel from CNS Planning and ATM Airspace Management are also affected.
- **Question 2** is to **Assess the significance of the project/change outside AAI.** The clue given is to consider the number of services users and/or stakeholders affected, including the interfaces between these parties, e.g. government departments, customers and other

ANSPs. As in the previous question, all stakeholders who are affected by the proposed change during all four phases of the project should be considered.
Similar to Q1, **More the affected areas, higher the rating.**

- **Question 3 is to Assess the level of new functionality introduced, or removed, by the proposed project/change, as opposed to the existing system, facility or service.** Does the new system enhance/reduce existing functionality or provide different functionality? Consider new technology. The different phases of the project do not have much significance here as the question wants the participants to think about the level of new functionality introduced or removed including upgradation (or otherwise) of technology.

  Rating should be decided in accordance with the level of new functionality introduced or removed.
  An example of this question would be a project where existing ATC Radar is replaced with new state-of-the-art radar. Here the functionality introduced is more or less the same as the existing radar but considering the fact that the new radar incorporates latest technology, rating given will be somewhere in the middle of the scale.
  However, if the assessment was for removal of existing radar system, then the level of functionality removed will be high as aircraft will not be provided with surveillance services.

- **Question 4 is to Assess the safety significance of the systems, facilities or services affected by the project/change?** Consider for example radar systems, communication systems, data systems, AFTN, Runways, Taxiways and any organization systems such as safety reporting etc. (People / Procedures / Technology). This question directs the participants to consider the safety impact of the change. The important aspect to be considered here is that whether the project is introducing a facility, procedure or equipment or removing it, safety significance, whether enhanced or reduced, will be indicated in a positive scale.
  Rating should be as per the level of Safety significance (either enhanced or reduced)
  For example, the safety significance of installing an ILS on a non-instrument runway situated in a location of challenging terrain will be high. Similarly, the safety significance of withdrawing an already installed ILS (say for a temporary duration for replacement of equipment) from such a runway would also be high.

- **Question 5** is to Assess **the training component associated with implementing the project/change?** Consider type of training required, classroom or simulation, time lines, resources, recency requirements, etc. If the change or project involves significant time, resources and other time-critical elements like recency requirements (e.g. recency of ATC surveillance ratings during a radar replacement project), the associated training component will be high and would invite a higher rating. This question should consider all phases of the project from concept to operation but the significant contribution would be from execution and commissioning stages.

  Higher the associated training requirement, higher the rating.

- **Question 6** and last question is to **Assess the complexity of the transition from the existing system, facility or service?** Consider resources available, documentation, time lines, approvals, contingency arrangements, organizational changes, multiple locations etc. Transition from an existing system to the new system brought about by the project is a very important activity. If the transition is complex, which involves creation of SOPs (also contingency procedures should something go wrong) or multiple locations transitioning into the new system simultaneously, the rating given should be high.

  Higher the transition complexity, higher the rating.

  For example, the transition from Conventional Vertical Separation Minimum (CVSM) to Reduced Vertical Separation Minimum (RVSM) was a complex activity. The transition involved a major conceptual change for ATC (reducing vertical separation from 2000 ft to 1000 ft and also change in direction of some flight levels). Moreover, some adjoining

Flight Information Regions (FIR) were still maintaining CVSM which required the creation of transition airspace for changing from RVSM back to CVSM before releasing aircraft to such FIRs.

Another example, the integration of newly extended part of Runway in to the operational system. The transition is very complex as it involves many aspects like new visa -a visa old Runway marking, relocated PAPI & Glide path; changes in IAL procedure etc. at the time of changeover. Hence rating will be on higher side.

The ratings given to the six questions will then be added to obtain the size of the change as **Small** (total between 6 and 18), **Medium** (total between 19 and 30) or **Large** (total between 31 and 42).

1.3 Step 2 of SCARS Form leads us to the Safety Outcome of the Change.

It is during this process that the assessment team considers the major hazards which are likely to be encountered during the project. This is achieved through a Preliminary Hazard Analysis (PHA).

1.3.1. Preliminary Hazard Analysis (PHA) is different from a full-scale hazard identification process in many ways:

- In PHA, normally only major hazards are identified due to paucity of time. However, the hazards identified should be critical ones or a combination of high- consequence and low-consequence ones. Identification of a few low-consequence hazards only and ignoring the high-consequence hazards will lead to a wrong assessment.
- PHA will not assess the risks associated with the consequence of the hazards, in terms of likelihood and severity (this process will be done later when these hazards are transferred to the HAZLOG during the HAZID workshop). Instead, the effect of the consequences of the identified hazards on safe operations will be rated on a 7-point scale (1-no effect to 7-extremely high effect) after considering the presence of existing controls (defenses).
  The intention of identifying hazards in PHA is to obtain an idea about the safety outcome of the change which in turn will lead to an assessment of the overall magnitude of the change.
- Risk assessment is not carried out during PHA. Consequently, important actions like prioritizing the risks, deciding on the potential risk control measures and acceptance of risks are not done during the PHA. These steps will be carried out later when HAZLOG is created.

1.3.2 The safety outcome of change is calculated using the equation

$$\textbf{Safety Outcome} = \frac{\text{Total Score}\_X\_100}{(7 \text{ X No: of Hazards})}$$

The safety outcome is **MINIMAL** if the value is up to 44%, **REASONABLE** for value between 45% and 72% and **SUBSTANTIAL** for values 73% or above. Decimals should be rounded **UP** to the next higher value.

1.3.3 From the equation given in section 1.4.2, it is clear that if the identified hazards are of low-consequence, the total score will be less, for the same value of the denominator. Consequently, the safety outcome will be a lower value.

This does not mean that only high-consequence hazards should be identified during PHA. The endeavor should be:

- not to omit any obvious high-consequence hazards; and
- To identify as many hazards as possible within the available time.

1.3.4. The ratings assigned to the consequences of the identified hazards should be based on their estimated effects on safe aircraft operations. The hazards can be detrimental to safe operations but if the ***existing*** controls (defenses) in the form of training, technology,

procedures or regulations can reduce the ill-effects of the hazards, a lower rating can be assigned.

1.3.5. It was opined by many that during the process of carrying out the PHA, the decision whether a control is an existing defense or a potential mitigation strategy poses some difficulties.

A typical example is that of a NOTAM action to inform the pilots about the presence of men and material near the runway during a proposed runway extension work. During the Conduct of PHA (SCARS Form being completed), the NOTAM is not existing, thus make NOTAM a potential mitigation strategy rather than an existing defense.

The effect of the consequences of the hazard & its **rating should be assessed based on existing controls only and not potential ones**, even though such potential controls are common and very obvious.

1.3.6. SCARS Form has limited space for recording hazards identified during the PHA. If the number of hazards is more, separate sheets may be attached as Annexure.

1.3.7. Step 2 of SCARS Form has also a limited space for the names, positions and signatures of stakeholders assisting in the PHA (Completion of SCARS Form). If the number of stakeholders present in the meeting is more, a separate attendance sheet may be provided, which should later be attached with the completed SCARS Form.

1.3.8. There minor variation **between the PHA format given in DGCA Circular AD AC 1 of 2012 and C-SMS Manual.** The contents and information provided are more or less same in both the formats. Since DGCA has approved AAI's C-SMS Manual, the **PHA format provided in C-SMS Manual should be followed by stations**.

1.4 Step 3 of the SCARS Form is to find out the overall safety magnitude of the change. The results of steps 1 and 2 should be plotted in the matrix provided in page 5 of the Form to obtain the value of overall safety magnitude of the change as MINOR, MODERATE or MAJOR.

1.5 Step 4 of the SCARS Form helps to determine the method of safety reporting to be adopted based on the overall safety magnitude of the change.

• MINOR Change	HAZLOG (AAI-SAF-127)+ HAZID Form (AAI-SAF-105)
• MODERATE Change	HAZLOG+ HAZID Workshop+ HAZID Form
• MAJOR Change	Safety Plan + Safety Case + HAZLOG+ HAZID Workshop+ HAZID Form

1.6 Step 5 of SCARS Form is for recording the Safety Statement. Safety Statement needs to be written if the overall safety magnitude of the change is either **MINOR , MODERATE or MAJOR.**

1.6.1 The Safety Statement should provide an explicit statement that the proposed change is safe and should also provide justifications for the claim that the change is safe.

1.6.2 Safety Statement can be signed either by the Process Owner or APD/CIC/OIC.

1.7. Step 6 of the SCARS Form is to provide details of the Project Risk Register (PRR) created for the new project.

1.7.1. The responsibility of creating the PRR and maintaining it will be the responsibility of the Project Manager. The owner of the PRR will also conduct periodic review of the hazards and will forward the residual risks to the appropriate authority for signing-off.

1.7.2. After the project has been commissioned or the change implemented, the risks remaining in the PRR will be transferred to the HAZLOG (AAI-SAF-127) of the airport.

1.8 Step 7 to 11 of the SCARS Form involve obtaining the details of the officials involved in the process of completing the Form.

- **Step 7**. Indicate whether Safety Case is required to be prepared (put a tick). If a Safety Case is required (overall safety magnitude is MAJOR), provide the name, designation and signature with date of the person who has been assigned the task of preparing the safety case
- **Step 8**. Enter the name, designation and signature with date of the Project Manager.
- **Step 9**. Enter the name, designation and signature with date of the official who facilitated the change (Safety Manager). The Safety Manager is required to certify that *the Safety Assessment was conducted, fulfilling the requirements of the SMS*.
- **Step 10**. Enter the name, designation and signature with date of the official who approves the change and accepts the safety assessment.
- **Step 11** The concerned ED/HODs at CHQ level shall review for MAJOR Changes.

1.9 As mentioned earlier in this document, SCARS is the first step in the safety assessment process. SCARS Form will be completed only once for a particular project, at the concept phase itself.

1.10 Safety assessments in the form of hazard identification and risk assessment should continue for each of the following phases of project lifecycle i.e. - Concept + Design, Execution, Commissioning and Operation Phase.

2. Organizing Safety Assessment Meetings

2.1 Preparation of Project / system Description

Project /System Description is a detailed description of the system, affected by the proposed project /change.

2.2 The Project /system description should elaborate in detail under all applicable paras. The guidelines for the Description of the Project / Change is mentioned in SCARS form.

2.3 Safety risk management starts with a description of the system's functions as the basis for hazard identification. In the system description, the system components and their interfaces with the system's operational environment are analyzed for the presence of Hazards, as well as to identify those safety risk controls already existing in the system or the absence thereof. Hazards are analyzed within the context of the described system, their potentially damaging consequences identified, and such consequences assessed in terms of safety risks (the probability and resulting severity of the damaging potential of the identified consequences). Where the safety risks of the consequences of hazards are assessed to be too high to be acceptable, additional safety risk controls must be built into the system. Assessment of system design and verification that it adequately controls the consequences of hazards is, therefore, a fundamental element of safety management.

2.4 System description should be prepared by the Project Manager, which should be approved by the Process Owner before distribution.

2.5 Attendance

Meetings for completing SCARS Form and HAZID workshops should be attended by representatives of stakeholders. The persons attending these meetings should be qualified, competent and experienced in their own domains. AAI Safety assessments are qualitative assessments (as opposed to quantitative assessments based on statistical data) which rely heavily on the expert opinions of the participants. The outcomes of the SCARS exercise and the depth of identification of hazards will be in direct relation to the contributions by the participants.

In order to ensure quality participation, the airport should impress upon the stakeholders about the need for deputing the right persons to attend safety assessment meetings.

3. Meeting notice to Stakeholders

3.1 The project manager will issue a meeting notice for the proposed safety assessment to all

stakeholders at least 7 days before the date of the meeting with a reminder email sent 2 days before the meeting date. The notice should contain a brief about the project/ system description. If the safety assessment requires the presence of an expert with specialized knowledge (e.g. Aircraft Maintenance Engineer with specific type of Aircraft, the mail / letter should reflect this need.

4. Role of Project Manager

The Project Manager is the domain expert of the project. She/he should be able clarify any doubts raised by the participants. The meeting should start with a presentation by the Project Manager, about the project being assessed.

5. Role of Facilitator (Safety Manager)

The facilitator's task is to:

- guide the meeting through the different steps of the SCARS and/or risk assessment process. The facilitator should make a brief presentation about the methodology adopted in AAI immediately after the presentation by the Project Manager.
- assist in stimulating a thorough and systematic search for hazards
- keep the discussion focused on the subject under discussion
- assist the Project Manager in:

  - filling up the SCARS Form
  - Acceptance of mitigation measures proposed by the stakeholders by the concerned directorate/discipline HOD in AAI-SAF -105 form.
  - Preparation of PRR and HAZLOG
  - Preparation of final set of documents to be send to CHQ etc.
  - Periodic review of the proposed mitigation measures

- Further the minutes of meeting should incorporate the following –

  - Salient features of the proposed project/system/change.
  - Comprehensively identified list of hazards.
  - Mitigation measures for each hazard.
  - Accountable executive will ensure compliance of these points in the minutes of meeting.

6. Role of Stakeholders

Stakeholders should nominate the right persons for attending the safety assessment meetings. They should be able to contribute to achieving the objectives of the meeting from the stakeholder's perspective.

7. HAZID Workshop

If the SCARS Form indicates a MODERATE or MAJOR change, a HAZID workshop in addition to PHA (Step 2 of SCARS Form) needs to be conducted to identify new Hazards.

It is recommended to conduct the HAZID workshop even when the magnitude of change is MINOR, so that new hazards may be identified.

The HAZID workshop may be conducted in continuation of the SCARS meeting. The hazards identified in the PHA can be assessed first in AAI-SAF-105 followed by identification and assessment of more hazards. The participants can also be asked to identify hazards in Consultation with their colleagues and mail them to the Process Owner / Facilitator within a specified deadline.

HAZID workshops primarily employ brainstorming technique to identify hazards. Other methods like Failure. Mode and Effects Analysis (FMEA) may be used for specific cases (assessment of equipment's, etc.).

8. Hazard Register (HAZLOG-AAI-SAF-127)

HAZLOG is the backbone of an SMS. A well-maintained HAZLOG can act as a repository of active hazards pertaining to the airport. It is a real-time indication of the safety health

of an airport as well as a safety library for future reference.

9. **Hazard identification and Analysis form (HAZID form-AAI-SAF-105)**:
Each identified Hazard- consequence combination should be recorded and analyzed in a different HAZID form. These collections of Hazards may be transferred into centralized Hazard log template provided in AAI-SAF-127**.**

Preparation of Safety Plan and Safety Case

Introduction

When overall safety magnitude of any change/ project is determined as Major than Safety Plan and Safety case have to be prepared.

A **Safety Plan** is used to communicate essential information to stakeholders including the end user about the proposed project or change.

Safety Plan preparation must commence early in the project/change life cycle, and be updated as appropriate during the course of the project/change implementation.

The Safety Plan must detail the:

a) scope of the change in operational and organizational context;
b) assumptions, constraints and dependencies influencing the safety outcome of the project/change;
c) responsibilities, titles and names of the people managing the project/change;
d) consultation and communication arrangements for the project/change;
e) safety management activities to provide the safety assurance of the project/change;
f) timelines and milestones;
g) resources and facilities required;
h) training and education requirements;
i) review process; and
j) approval authorities and requirements for the resultant safety documentation.

A **Safety Case** is a report that presents a structured and comprehensive argument, together with evidence, that a project or change proposal can be safely implemented into the ANS and Airport systems. It is one of the primary mechanisms used by AAI Managers to demonstrate that they are effectively managing the safety implications of their project/change process.

A Safety Case may be submitted to DGCA to take their approval of a proposed change.

Safety Cases must detail the:

a) scope of the change in operational and organizational context;
b) validation of any assumptions, constraints and dependencies affecting the safe outcome of the project/change;
c) responsibilities, titles and names of the people managing the project/change;
d) consultation and communication arrangements for the project/change; and
e) outcomes of the safety management activities prescribed in the Safety Plan including the:
    i. hazard identification and risk management activities, tools, procedures and standards used to provide safety assurance, for normal and abnormal modes of operation

ii. HAZLOG Register Report detailing the identified hazards and risk controls/safety requirements, including their status
iii. acceptance by the appropriate level of management of the various levels of risk associated with each hazard
iv. arrangements for any training and education requirements
v. timelines and milestones for the ongoing safety management of the change pre and post implementation
vi. argument that, when implemented with the identified controls, the proposed change will be adequately safe; and
vii. arrangements and timing for the Post Implementation Review (PIR) of the change following implementation.

Safety case preparation must commence early in the project/change life cycle, and be updated as appropriate during the course of the project/change implementation.

Steps to prepare a Safety Plan and Safety Case

Safety Plan/Safety Case has to be prepared by Process owner and /or Project Manager with the assistance of safety manager.

Type of Safety Cases

A single Safety Case should normally be prepared for all phases of the project lifecycle:

For large projects or significant changes, it may be useful to split the Concept/Design into separate Concept and Design phase Safety Cases. This may help ensure that design effort is not wasted on an unsatisfactory concept. This is well worth considering for projects with major safety implications, projects with national or system wide implications, and projects with long development timeframes.

Separate project phase safety cases offer advantages with regard to management oversight, review and approval, during the course of the project.

For large projects and significant changes to systems, facilities and services, a Design Safety Case may benefit by treating the different elements of the change in separate sections or chapters of the document, brought together by an overall Design Safety Case. For projects impacting on multiple sites it may be beneficial to have site-specific Execution/Commissioning Safety Cases, brought together by an overall Execution/Commissioning Safety Case.

Establish an Official File

Arrange for an Official File to be raised on this Safety Case and file all safety related documents (evidence) in this file.

This Official file should include:

- the Safety Plan,
- the Safety Case,
- PRR and Hazard Register,
- details of all meetings/workshops, testing, and other safety activities (such a simulation); and
- all correspondence pertaining to the project.

Prepare a Safety Plan

A Safety Plan must be prepared before proceeding to develop a Safety Case.

A Safety Plan may be written for each stage of the project lifecycle, for example, a Design Safety Plan followed by an Execution/Commissioning Safety Plan. Where a single Safety Plan is used, it must be updated for each phase of the project lifecycle. Guidance is provided within the Safety Plan Template.

Safety Plan Review

Safety Plans must be reviewed by the Dte. Of Aviation Safety. After the Safety Plan has been approved, it should be communicated to all stakeholders and the original copy filed in the Official File.

Concept/Design Phase Safety Case

The Concept/Design Phase of a project is when the broad functionality of a new system, service, standard or process is determined.

The purpose of a Concept/Design Phase Safety Case is to show that the new concept, new system, facility or service, a new standard, or a new way of operating will be adequately safe "in principle" before trying to implement it. The Safety Case should describe the process used to develop the design solution. This should include information on the standards and design methods employed for error and hazard avoidance, detection and elimination during the development of the design, and present arguments as to why these are appropriate.

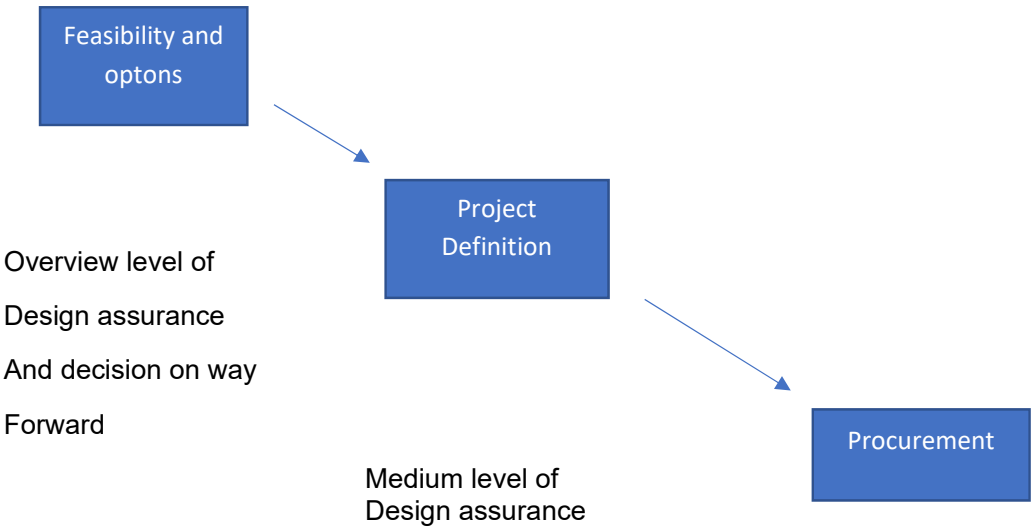
A Concept/Design Safety Case should record:

- functions and operation of the new system, facility or service;
- process by which the design of the new system, facility or service was determined– this may include compliance with statutory or regulatory requirements, functional and performance requirements, etc.;
- systematic processes to identify the risks and determine the risk controls;
- risk controls and mechanisms identified in these processes;
- Safety Requirements identified as "essential" in these processes; and
- arguments that, when implemented with the identified controls, the proposed change will be adequately safe.

Assurance of the design integrity may come from, for example:

- design maturity - proven reliability and integrity;
- experience of similar systems, facilities or services;
- proven system architectures;
- design calculations - reliability and integrity; or
- safety assessment of the design solution including safety analysis, verification and validation etc.

Typical Project Design Phase



Feasibility and Options

During the Feasibility and Options phase different design options are developed and assessed. Establish for each option whether it is possible and practical to meet the Safety Requirements. Collect evidence for assurance that the option has the potential to meet the Safety Requirements. Record and verify constraints and assumptions identified during the consideration of options.

Project Definition

Establish with evidence that all performance objectives and Safety Requirements will be met by the system, facility proposed, the design processes will be adequate and the system or facility can be installed, constructed, commissioned and introduced into service safely. If the

project has a number of different system or facility elements, apportion the safety requirements to those elements. Record and verify constraints and assumptions identified during project definition which are necessary to maintain safety.

Ensure that competing contractors are producing sufficient information and evidence concerning safety.

Design Authorities

It is important that we know who is responsible for the design integrity. The Concept/Design Safety Case should identify the design authorities for the systems facilities or services as appropriate. All Design Authorities associated with the safety case should be identified.

Functional and Performance Safety Requirements

The Concept/Design Safety Case should specify any functional and performance characteristics for the design. The characteristics are known performance requirements that do not need to be determined through hazard identification activities. Include targets for accuracy/resolution, audibility, definition, response times, ergonomics, availability and reliability, alerts, levels of service, design life, procedures and training requirements where these affect the safety of the system or facility or service in operation. Describe how these will be confirmed before implementing the change.

Potential Controls and Safety Requirements

Detail the Safety Requirements and the potential risk controls which were determined from the hazard identification activities, and their current status. Where practicable, try to describe the Safety Requirements and controls, in relation to identified failure modes and the tolerable likelihood of their occurrence.

Execution/Commissioning Phase Safety Case

The Execution/Commissioning Implementation or “Transition” phase of a project is when we actually move to implement a design which has already been determined to be adequately safe.

The purpose of an Execution/Commissioning Phase Safety Case is to show the:

- integrity of an existing system has not been compromised
- design integrity of the new system, facility or service has been preserved by the Implementation process; and
- the new system, facility or service can be operated safety.

An Execution/Commissioning Safety Case should record:

- the process by which operational and engineering readiness is achieved and signed off;
- the systematic processes used to determine the risk controls for the implementation;
- the risk control mechanisms identified in these processes including simulation, mimicking, ghosting, and roll-back plans;
- the Safety Requirements identified as “essential” in these processes;
- confirmation that the design has met its Safety Requirements; and
- the arguments that, when implemented with the identified Safety Requirements and controls, the proposed change can be safely operated.

The Execution/Commissioning Safety Case should record any limitations on the use, or maintenance, of the system, facility or service identified in the design. Reliance on other systems, facilities or services should be explained. Any unresolved shortcomings which could result in a hazard should be declared, along with any temporary design fixes and workarounds.

Training

Training aspects of a project/change become important during the Execution/Commissioning phase, as sufficient training is required to be completed prior to operation. Conversely training can be impacted if commissioning delays are experienced, which impact on the recency of training provided.

The safety case should detail the outcomes of:

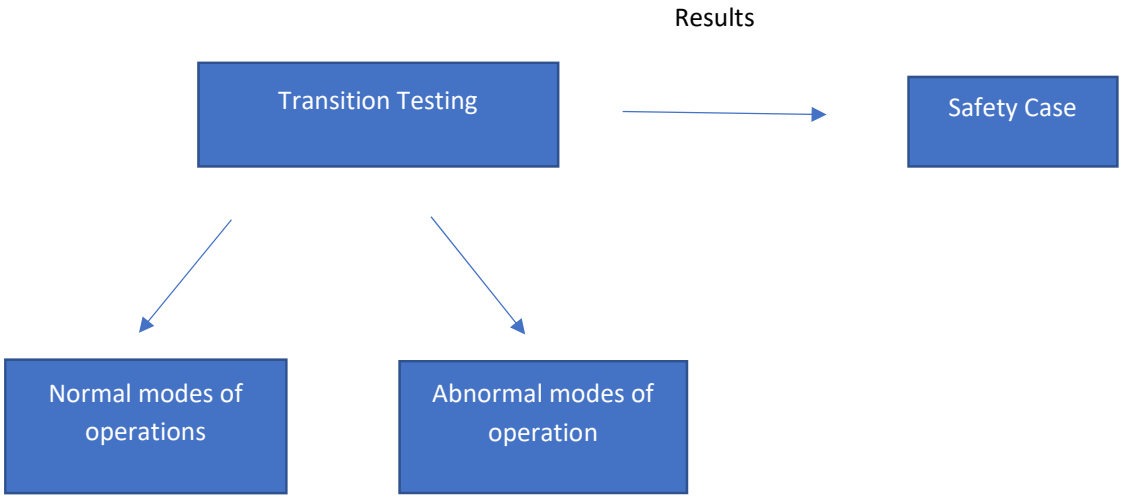
- training needs analysis (TNA);
- requirements determination;
- Development;
- delivery;
- Performance and Assessment Check;
- capture and management of training records.

Transition Testing

A test strategy ideally should be initiated after the Safety Requirements have been achieved.

In ATM system design, it is usual to functionally decompose the requirements into sub-systems of manageable complexity, which when combined provide the total system functionality. Associated with this is the progressive integration of tested sub-systems into a fully validated system.

Normal and Abnormal Modes of Operation



Normal and abnormal modes of operation should be tested in the Execution/Commissioning phase. Compared with normal operation all sorts of other modes may exist which pose threats to safety and need to be considered. When a system, facility or service is in its normal operating mode it can become degraded, either intentionally or unintentionally. Intentionally, could be for routine maintenance, enhancement or modification.

Unintentionally, it is most likely to be due to failure, but could be the result of sabotage.

Historically, the degraded modes pose some of the greatest threats to safety.
Abnormal modes of operation may include:

- total failure;
- partial failure (degraded mode); or
- anomalous operation (not working as intended).

The Execution/Commissioning Safety Case should describe the development of:

- reversion strategies in case of problems during transitioning; and
- contingency plans in case of problems during operation

Contractors and contracts

AAI is ultimately accountable for Safety Cases and the overall Safety Plan. Contractors can be made responsible for discharging activities within the Safety Plan, but only within their scope of delivery. AAI may require contractors do their own Safety Plan, as a requirement within the contract. This may assist in quality assurance by allowing third party assessment of the design process. The ability to conduct third party audit and assessment should also be considered for inclusion in the contract.

The contract needs to define arrangements for the contractor to provide evidence that the procured system or facility when constructed will meet its Safety Requirements. AAI project managers should monitor and control the contractor to ensure the design process is adequate and the design implements the Safety Requirements.

Prior to delivery of a system or facility element, AAI needs to be assured that construction, installation and commissioning activities will not adversely affect the safety of the ANS and Airports system. Design Safety Case should be prepared and approved before transitioning to operation.

Approvals

Risk acceptance and approval of safety case

Relevant Executive Director (ED) is the approving authority

The person who approves a Safety Case signifies that he/she agrees with the systematic hazard identification process, risk evaluation, and risk management plans. A person approving a Safety Case is signifying that he agrees that the document has been adequately assessed and the risks are controlled, and that the system, facility or service is authorized for use and complies with Statutory and Regulatory Requirements.

Safety Case review – Peer, ASD and external

All Safety Cases after the approval by the concerned EDs must be sent to Aviation Safety Directorate, CHQ for review by ED, (AVS) prior to the implementation of any change.

Depending on the magnitude of the risks, the Process owner, possibly in conjunction with ASD, may decide that an external third-party review is needed.

Approval to proceed

A project can only proceed if its Safety Case is approved and reviewed.

All hazards and the corresponding Safety Requirements and controls must be reviewed for their status prior to any implementation. Where it is likely that a safety requirement will not be met prior to implementation, action must be taken immediately to address this and communicated to the approving authority of the safety document.

Maintaining the Safety Case

Living document or rolled into operating systems?

Some Safety Cases for a project/change will have a limited active life (up to project commissioning and Post Implementation Review (PIR). These Safety Cases will however remain part of AAI's accountability mechanisms and must be retained on file under intimation to ED (Aviation Safety).

Other Safety Cases for changes such as the introduction of new systems, facilities or services may continue to be maintained in operation. Managers need to decide if the Safety Case will continue to be a living document, or whether the information will be transferred into any ongoing risk management systems. These decisions should have been made in the preparation of the Safety Plan, but may need to be revisited following commissioning into operation.

Post Implementation Review

The levels of risk will change after the system, facility or service has been operating for a period. Some issues may not have been resolved at the time of commissioning. There may be some good safety lessons to be learnt from this change. Hence the Safety Case should describe the arrangements and timing for a review of the change following commissioning. This should include:

- how the review will take place;
- what measure(s) will be used to determine success or otherwise;
- who will be involved; and
- how the issues will be managed so that lessons can be learnt.

Updating a Safety Case

Safety Cases should be kept up to date to contain all the risks identified during the design and implementation project phases.

Guidance note: risk reduction

If controls have been introduced, or the risk REDUCED in other ways, the responsible person shall incorporate these in the Safety Case until the time of the next cyclical review of the Safety Case.

Guidance note: risk increase

The responsible operational or Project Manager must update the Safety Case before any change is implemented which may increase risk or unassessed risks that have not been assessed.

A Safety Case should not claim that something is being done if this is no longer the case, such as a Safety Requirement or risk control that has been discontinued, a procedure that is no longer used, or monitoring activity that is no longer done.

Management review of risks, hazards, or other parts of the Safety Case

A person approving a Safety Case or accepting the risk associated with a particular hazard may add, reject or modify part or all of a hazard, and/or its associated risk evaluation, controls and Safety Requirements. Such actions must be documented and justified within the safety case. HAZLOG entries must be updated accordingly.

Audit of Safety Cases

Safety Cases are subject to audit, and should feature periodically on ASD's audit programmes to ensure that the status of Safety Requirements and risk controls continues to be valid, the identified monitoring activity is taking place, and the content remains current.

Safety Plan Template
(Concept/Design/Execution/Commissioning)

PROJECT TITLE

The following signature block is required to be completed, by the person:

- **Preparing** the Safety Plan.
- **Proposing** the Safety Plan: as the means of communicating and managing the safety aspects of the project. This person is responsible for the management of the project.
- **Accepting** the Safety Plan: as the means of communicating and managing the safety aspects and their effect on operations during the course of the project. This person is responsible for the ongoing safety of operations during all phases of the project. Where the project impacts multiple Directorates, acceptance is required from each Directorate.
- **Approving** the Safety Plan: where changes have national implications, the relevant Directorate ED is the approving authority.
- **Reviewing** the Safety Plan: the ED (Aviation Safety) will review the Safety Plans supporting the development of Safety Cases, following a successful review.

NAME AND POSITION	SIGNATURE	DATE
Prepared by: <insert name> **Position: <insert position>**		
Proposed by: <insert name> **Project Manager**		
Accepted by: <insert name> **Operating Authority**		
Accepted by: <insert name> **Engineering Authority**		
Approved by: <insert name> **Position: <insert position>**		
Reviewed by: <insert name> **Aviation Safety Directorate**		

About this Template:

This template is designed to assist staff with the development of a Safety Plan. The headings and information (italics) contained within the template are for guidance.
Document authors may find it necessary to add or omit information from the template, depending on the project being proposed. Additional information about Safety Plans can be found in AAI-SAF-104:
Non- project related information should be removed (all blue italic text).

Document control information

Document Owner	
File Reference(s)	
Electronic Master Storage	
Hard Copy Master Storage	
Document Register Number	

Review/Amendment Record			
Issue Number	**Section(s) Reviewed/Amended**	**Reviewed/Amended by**	**Date**
1	Initial issue		

1. **Background**

Describe the reasons for undertaking this project. Include reference to the relevant SCARS where applicable.

2. Purpose

Describe the purpose of this document and what it is expected to achieve. Is this a Concept, Design, Execution and Commissioning or Operations level Plan?

3. Scope of the change

Describe the present system, facility or service and the change(s) proposed.

Consider the effect on:

- service(s) provision under ICAO;
- service delivery lines;
- systems*/facilities/services including design, operations and maintenance; and
- people and associated procedures.

* Note: System includes the data and networks aspects of the system also.

4. Assumptions, Constraints and Dependencies

Factors that could influence the safety outcome of the change?

4.1 Assumptions

Describe any assumptions being made which could affect the project scope, strategies or outcomes.

4.2 Constraints

Describe any constraints which could restrict the ability of the project to achieve a safe outcome.

4.3 Dependencies

Describe any dependencies on other projects or activities which could impact the outcome of this project, or where other projects or activities are dependent on the outcome of this project.

5. Responsibilities

Describe the people who are the key players and have been committed to the project and their primary responsibilities. For example:

Title and Name	Primary Responsibilities
Project Sponsor:	• Go/No-Go decision on Project
Project Manager:	• Preparation of this Safety Plan and Safety Case • Completion of the project within the constraints of safety, time, cost and scope • Development, monitoring and approval of Project Plan
Subject Matter Experts: (All Directorates)	• Development of operational documentation and procedures • Development and delivery of Training • Participation in HAZID Workshops • Endorsement of Staff
ATS Systems Specialist:	• Development of plans for and implementation of the agreed technical proposal, including Engineering Readiness and Delivery and Transition Plan • Identification of technical hazards and development of controls and safety requirements • Liaison with CNS/other ATM areas/Airport Operations
CNS Specialist:	• Development of a proposal • Development of plans for and implementation of the agreed technical change including works plans and safety considerations • Facilitate development of the Safety Case
Airport operations Specialist:	• Development of plans for and implementation of the agreed facility change including works plans and safety considerations • Identification of operational hazards and development of controls and safety requirements • Liaison with CNS/ATM/other airport operations dte development of the Safety Case
Safety Manager:	• Facilitate HAZID workshops

6. Consultation and Communication

Describe the consultation and communication arrangements to be undertaken by the project team throughout the project phases. This includes both internal and external stakeholders, and may include, but is not limited to:

- Planning Directorate,
- ATM – local and/or National,
- CNS – local and/or National,
- Airport Operator,
- Defence – local and/or National,
- Airlines and other Aviation Bodies,
- External and/or International ATS providers,
- DGCA, if necessary.

7. Safety Management Activities

Describe the safety management activities for each area of change indicated in the scope, and for each phase of the project. For example: changes to the design, operation or maintenance of services, facilities, or equipment, and the associated procedures and people. These may include, but are not limited to:

- HAZID Workshops – use relevant competence and experience for facilitation and participation in workshops. Participants must include a broad representative range of stakeholders, including external parties where necessary. If there is a potential need to hold additional workshops, these

should be flagged.
- testing, verification and validation;
- simulation and training exercises;
- trial implementation – under surveillance and with sufficient backup or reversion strategy, until sufficient data and experience has been acquired;
- preliminary studies - evaluation of overseas or other experience;
- reviewing past and current hazard information; and
- quantitative modelling - based on sufficient data, using a validated model and analyzed assumptions.

8. Timelines and Milestones

Detail the target dates and locations for the planned safety management activities. Milestones should include subsequent safety document development, e.g. Safety Case, and allow time for the peer review and ASD approval processes.

Date	Location/Activity

9. Resources

Identify the resources that will be required to carry out the safety management activities from the operational, support and technical areas.

10. Training and Education

Describe the proposed arrangements for the:
- training needs analysis (TNA);
- requirements determination;
- development and delivery; and
- Performance and Assessment Check.

11. Review

Describe the arrangements for the review of the Safety Plan keeping in view that due process has been followed and the content is valid. Detail how recommendations resulting from the review process may be included.

12. Approvals

Detail the Approving Authorities and requirements for the resultant Safety Case.

13. Related documents

List any related documents.

Safety Case Template (Concept/Design/Execution/Commissioning)

<PROJECT TITLE>

The following signature block is required to be completed by the person:

- **Preparing** the Safety Case.
- **Proposing** the Safety Case: as the means of communicating and managing the safety aspects of the project. This person is responsible for the management of the project.
- **Accepting** the Safety Case: as the means of communicating and managing the safety aspects and their effect on operations during the course of the project. This person(s) is responsible for the ongoing safety of operations during all phases of the project. Where the project impacts multiple Directorates, signatures are required from each Directorate.
- **Approving** the Safety Case: The relevant Directorate ED is the approval authority.
- **Reviewing** the Safety Case: the ED Aviation Safety will review Safety case.

NAME AND POSITION	SIGNATURE	DATE
Prepared by: <insert name> **Project Manager/Safety Manager**		
Proposed by: <insert name> **Project Manager**		
Accepted by: <insert name> **Project Owner**		
Accepted by: <insert name>		
Approved by: <insert name> **Concerned Executive Director**		
Reviewed by: <insert name> **Executive Director (Aviation Safety)**		

This template is designed to assist staff with the development of a Safety Case. The headings and information (italics) contained within the template are for guidance.

Document authors may find it necessary to add or omit information from the template, depending on the project being proposed.

Non-project related information should be removed (all blue italic text).

The information in sections 1 to 5 of this document may be obtained from the associated Safety Plan. In using this information, the document preparer should first review the information in the Safety Plan to check that it remains valid. Safety document preparers should ensure the document is clear and concise. Statements should be supported by evidence.

All Phases Safety Case should record the safety assurance activities and their outcomes from the concept phase of a change through to operation. This includes the:

- process by which the design of the new system was determined;
- process by which operational and engineering readiness is achieved and signed off;
- systematic processes to identify the risks and determine the risk controls for the concept, design, Execution and commissioning phases;
- risk control mechanisms identified in these processes;
- safety requirements identified as “essential” in these processes;
- confirmation that the design has met its safety requirements through implementation;
- argument that, when implemented with the identified controls, the system/facility/service can be operated or provided safely.

Document control information

Document Owner	
File Reference(s)	
Document Register Number	

Amendment Record			
Issue Number	**Section(s) Amended**	**Amended by**	**Date**
1	Initial issue		

1. Background

Describe the reasons for undertaking this project. Include reference to the relevant SCARS where applicable.

2. Purpose

Describe the purpose of this document and what it is expected to achieve.

3. Scope of the change

Describe the present system, facility or service and the change(s) proposed for that system, facility or service.

Consider the effect on:

- service(s) provision;
- directorates, aerodromes, ATS centers and units;
- systems*/facilities/services including design, operations and maintenance; and
- people and associated procedures.

* Note: System includes the data and networks aspects of the system

4. Assumptions, Constraints and Dependencies

Detail any additional assumptions, constraints and dependencies not included in the Safety Plan. Validate all the assumptions, constraints and dependencies affecting the safe outcome of the change.

4.1 Assumptions

Describe any assumptions made which affected the project scope, strategies or outcomes.

4.2 Constraints

Describe any constraints which restricted the ability of the project to achieve a safe outcome.

4.3 Dependencies

Describe any dependencies on other projects or activities which impacted the outcome of this project, or where other projects or activities are dependent on the outcome of this project.

5. Responsibilities

Describe the people who have been committed to the project and their primary responsibilities.

6. Consultation and Communication

Describe the consultation and communication arrangements that were undertaken by the project team throughout the project phases. This includes both internal and external stakeholders.

7. Design Process

7.1 Design Integrity

Describe the process used to develop the design solution. This section should provide information on the standards and design methods employed for error avoidance, detection and

elimination during the development of the design and present arguments as to why these are appropriate.

Assurance of the design may come from, for example:

- design maturity - proven reliability and integrity;
- experience of similar systems/facilities/services;
- proven system architectures;
- design calculations - reliability and integrity.

In some cases, design development may not be completed until the system has been operated and evaluated in its intended environment. Outstanding work affecting safety assurance of the design should be highlighted.

7.2 Functional and Performance Requirements

Specify any functional and performance characteristics for the design. Include targets for accuracy/resolution, audibility, definition, response times, ergonomics, availability and reliability, alerts, levels of service, design life, procedures and training requirements where these affect the safety of the system, facility or service. Describe how these will be confirmed before implementing the change.

7.3 Design Confirmation

Describe the process used to confirm that the design solution has not been compromised during the implementation process. Provide evidence (such as test results) that the design meets the intended requirement and fulfills the safety objectives, and that the functional and performance requirements have been achieved.

7.4 Design Procedures and Standards

Describe any specific procedures or standards that were used in achieving a safe outcome. Where DGCA or ICAO are required to develop or amend standards, confirm the development or amendment of the standards.

7.5 Design Limitations and Shortcomings

State any limitations on the use, or maintenance, of the system or facility or shortcomings identified in the design. Reliance on other systems, facilities and services should be explained.

Any unresolved system or facility shortcomings which could result in a hazard should be declared. Temporary design fixes and short-term procedures or workarounds should be declared.

7.6 Design Authorities

Identify the Design Authorities for the systems, facilities and services as appropriate. All Design Authorities associated with the safety case should be identified.

7.7 Design Hazards, Controls and Safety Risk Management

Detail the Hazards, Controls and Safety Requirements determined from the hazard identification activities, including their status. Controls and Safety Requirements should be expressed so that their achievement can be measured. Describe the process used for capturing hazards that were identified outside the formal means above, i.e., those hazards that were identified on an ad-hoc basis. Who were they sent to? How were they captured and processed? State any other tools that were used for safety assurance purposes, and how they were used.

The Hazard Register (HAZLOG) includes this information and should be included here or attached as an appendix.

8. Implementation Process

8.1 Transition to Operations

What process will be followed for installation, integration and transitioning to operations?

8.2 Procedures and Standards

Describe any specific procedures or standards that were used in achieving a safe outcome.

8.3 Safety Management Activities

Describe the safety management activities for the Execution/ Commissioning phase of the

project.

Describe the process used for capturing hazards that were identified outside the formal means above, i.e., those hazards that were identified on an ad-hoc basis. Who were they sent to? How were they captured and processed?

8.4 Hazards, Controls and Safety Requirements

What are the outcomes of the hazard identification activities?

Detail the Hazards, Controls and Safety Requirements determined from the hazard identification activities, including their status. This information and should be included here or attached as an appendix.

8.5 Risk Management

Where Controls or Safety Requirements are "not met" or "yet to be met":

- provide a provisional argument regarding the safety of moving to operation;
- specify the monitoring arrangements; and
- validate residual risk estimations.

State any other tools that were used for safety assurance purposes, and how they were used.

8.6 Pre-Implementation Risk Assessment

Describe any activities for review of the risks just prior to commissioning, and their outcomes.

9. Procedures and Engineering Support

Confirm that the relevant ATS/Engineering/Airside Operations/CNS procedures and instructions, Service Level Agreements, maintenance agreements, contacts etc. developed as a result of the change are in place.

10. Safety Performance Monitoring

Specify any aspects of the system, facility or service performance that should be monitored in service to provide assurance that the safety requirements continue to be met in operation.

11. Training and Education

Detail the outcomes of:

- training needs analysis (TNA);
- development and delivery of training programme;
- Performance and Assessment Check; and
- training records.

12. Business Continuity

Describe the development of:

- reversion strategies in case of problems during transitioning; and
- contingency plans in case of problems during operation.

13. Conclusion

A Safety Case should contain both the evidence and ARGUMENT that a change can be safely implemented and operated. Use the evidence gathered during the safety assessment process to make the ARGUMENT that this change can be safely implemented and operated.

14. Post Implementation Review

Describe the arrangements and timing for a review of the change following commissioning. Describe how the review will take place, what measure(s) will be used to determine success or otherwise, who will be involved, how the issues will be managed so that lessons can be learnt.

15. Document Review

Review feedback should be available on file, the reference should be provided.

16. Appendices

Include any appendices referred to in the text.

17. Related documents

List any related documents and provide links where appropriate.

Hazard Identification and Analysis Form (HAZID form)

(Detailed relevant information in chapter 8 and guidelines may be read before filling up this form)

Project:	Date of reporting Hazard

Hazard description:	Hazard no.

Consequence of Hazard

Existing Risk Controls:		
Severity:	Likelihood:	Initial Risk Classification:

Potential Risk Controls (may include improving existing controls) to achieve ALARP:		
Severity:	Likelihood:	Residual Risk Classification:
Action officer for Potential Control Signature : Name: Designation:	PDC:	Remark:
I am satisfied with the hazard analysis process, control measures applied and I accept the residual risk. Signature of Residual Risk Accepting Authority (Refer para 8.16.8 of C SMS Manual)		

GUIDELINES FOR COMPLETING THE AAI-SAF-105 FORM

1. Project: The name of the project for which the Hazard is identified or name the source of hazard identification, like voluntary reporting, accident investigation, audit etc.
2. Date: Date of reporting of the hazard
3. Hazard: Write the Hazard description
4. Consequences: Write the consequences of the hazard. For each consequence, a separate AAI-SAF-105 form has to be completed.
5. Existing Risk Control: Risk Control measures which are available at the time of assessing the hazard should be considered.
   Caution: NOTAM action will be initiated, is not an existing control, it is a potential control.
6. Severity: Based on the existing control or potential Control (as applicable), find out the severity considering the severity table.
7. Probability: Based on the existing control or potential Control measures (as applicable), find out the probability of the consequence using the probability table.
8. Initial Risk Classification: Classify the Severity and Probability of a consequence based on the existing control. Using the Risk Matrix table evaluate the initial risk classification.
9. Potential Risk Control: Identify the potential risk control for reducing the risk up to ALARP level considering the cost benefit analysis and practicability of the risk control.
10. Residual Risk Classification: The calculated severity and probability of the consequence should be interpolated in the Risk Matrix table and finalize the risk classification value.
11. Residual Risk Accepting Authority: The residual risk shall be accepted by the appropriate authority as per para 8.16.8 of C-SMS manual.
12. On completion of AAI-SAF-105 form, all active Hazards shall be transferred to Hazard Register- (HAZLOG-AAI-SAF-127).

Hazard Listing Form

This form may be utilized for listing the Hazards and their Consequences during any Hazard identification workshop [other than Step 2 of SCARS Form (PHA)] such as Hazard identification workshop for Project /Change or Hazards reported through VRS, Confidential Report etc.

Hazard (as defined in Doc 9859): A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

Project / Source :	Date of reporting Hazard

S.No.	Hazard description	Consequence	Remarks

Signature
(Project/Safety Manager)

SMS COMPLIANCE CHECKLIST (GAP ANALYSIS)

1. Background

In accordance with the DGCA Civil Aviation Requirements (CAR) SECTION 1 – GENERAL SERIES 'C' PART I Issue II, 24th March 2022, service providers are responsible for the implementation of a Safety Management System (SMS)..

2. Gap analysis

The implementation of an SMS requires a service provider to conduct an analysis of its system to determine which components and elements of an SMS are currently in place and which components and elements must be added or modified to meet the implementation requirements. This analysis is known as gap analysis, and involves comparing the SMS requirements against the existing resources in the service provider.

The form is based on ICAO Gap Analysis template and provides, in checklist format, that will assist in the evaluation of the components and elements, that comprise the ICAO SMS framework, and help to identify the components and elements that will need to be developed. Once the gap analysis is complete and documented, it will form the basis of the SMS implementation plan of your organisation.

Each question in the attached form is designed for a “Yes” or “No” response. A “Yes” answer indicates that the organization meets or exceeds the expectation of the question concerned. A “No” answer indicates a substantial gap in the existing system with respect to the question‘s expectation. A “Partial” answer indicates that further enhancement or development work is required to an existing process in order to meet the question ‘s expectations.

The last column shall be used to describe the status of specific element implementation, or to provide any other relevant information. Please provide as much information as possible concerning the status of implementation of each element.

3. SMS Implementation Plan

On completion of the gap analysis, service providers are required to develop an SMS implementation plan which addresses gaps identified in the gap analysis. The implementation plan should be considered a ‘living document’ and routinely updated as actions are completed.

SMS Implementation Plan of AAI is named as AAI-SAF-109 (SMS Implementation plan format).

SMS Gap Analysis for India service providers

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
Component 1 – SAFETY POLICIES AND OBJECTIVES			
Element 1.1 – Management commitment and responsibility			
1	Is there a safety policy in place?	☐ Yes ☐ Partial ☐ No	
2	Does the safety policy reflect senior management commitments regarding safety management?	☐ Yes ☐ Partial ☐ No	
3	The Safety Policy is appropriate to the size, nature and complexity of the organization.	☐ Yes ☐ Partial ☐ No	
4	The Safety Policy is relevant to aviation safety.	☐ Yes ☐ Partial ☐ No	
5	Is the safety policy signed by the Accountable Executive?	☐ Yes ☐ Partial ☐ No	
6	Is the safety policy communicated, with visible endorsement, throughout the [organization]?	☐ Yes ☐ Partial ☐ No	
7	Is the safety policy periodically reviewed to ensure it remains relevant and appropriate to the [organization]?	☐ Yes ☐ Partial ☐ No	
Element 1.2 – Safety accountabilities			
1	Has the [organization] identified an Accountable Executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the [organization], for the implementation and maintenance of the SMS?	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
2	Does the Accountable Executive have full control of the financial and human resources required for the operations authorized to be conducted under the operations certificate?	☐ Yes ☐ Partial ☐ No	
3	Does the Accountable Executive have final authority over all aviation activities of his organization?	☐ Yes ☐ Partial ☐ No	
4	Has the organization identified and documented the safety accountabilities of management as well as operational personnel, with respect to the SMS?	☐ Yes ☐ Partial ☐ No	
5	Is there a Safety Committee or Review board for the purpose of reviewing SMS and safety performance?	☐ Yes ☐ Partial ☐ No	
6	Is the Safety Committee chaired by the Accountable Executive or by an appropriately assigned deputy, duly substantiated in the SMS manual?	☐ Yes ☐ Partial ☐ No	
7	Does the Safety Committee include relevant operational or departmental Heads as applicable?	☐ Yes ☐ Partial ☐ No	
8	Are there Safety Action Groups that work in conjunction with the Safety Committee? (large/ complex organizations as appropriate)	☐ Yes ☐ Partial ☐ No	
Element 1.3 – Appointment of key safety personnel			
1	Has the organization appointed a qualified person to manage and oversee the day-to-day operation of the SMS?	☐ Yes ☐ Partial ☐ No	
2	Does the qualified person have direct access or reporting to the Accountable Executive concerning the implementation & operation of the SMS?	☐ Yes ☐ Partial ☐ No	
3	The Manager responsible for administering the SMS does not hold other responsibilities that may conflict or impair his role as SMS manager.	☐ Yes ☐ Partial ☐ No	
4	The SMS Manager is a senior management position not lower than or subservient to other operational or production positions.	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
Element 1.4 – Coordination of emergency response planning			
1	Does the [organization] have an emergency response/contingency plan appropriate to the size, nature and complexity of the organization?	☐ Yes ☐ Partial ☐ No	
2	Does the Emergency/ Contingency plan address all possible or likely emergency/ crisis scenarios relating to the organization's aviation product or service deliveries?	☐ Yes ☐ Partial ☐ No	
3	Does the ERP include procedures for the continuing safe production, delivery or support of its aviation products or services during such emergencies or contingencies?	☐ Yes ☐ Partial ☐ No	
4	Is there a plan and record for drills or exercises with respect to the ERP?	☐ Yes ☐ Partial ☐ No	
5	Does the ERP address necessary coordination of its emergency response/contingency procedures with the emergency/response contingency procedures of other organizations where applicable?	☐ Yes ☐ Partial ☐ No	
6	Does the [organization] have a process to distribute and communicate the ERP to all relevant personnel, including relevant external organizations?	☐ Yes ☐ Partial ☐ No	
7	Is there a procedure for periodic review of the ERP to ensure its continuing relevance & effectiveness?	☐ Yes ☐ Partial ☐ No	
Element 1.5 – Documentation			
1	There is an SMS Manual which is approved by the Accountable Manager and accepted by the DGCA.?	☐ Yes ☐ Partial ☐ No	
2	Does the SMS Documentation address the organization's SMS and its associated components and elements?	☐ Yes ☐ Partial ☐ No	
3	Is the organization's SMS framework in alignment to the regulatory SMS framework?	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
4	Does the organization maintain a record of relevant supporting documentation pertinent to the implementation and operation of the SMS?	☐ Yes ☐ Partial ☐ No	
5	Does the organization have a SMS implementation plan to establish its SMS implementation process, including specific tasks and their relevant implementation milestones?	☐ Yes ☐ Partial ☐ No	
6	Does the SMS implementation plan address the coordination between the service provider's SMS and the SMS of external organizations where applicable?	☐ Yes ☐ Partial ☐ No	
7	Is the SMS implementation plan endorsed by the Accountable Executive?	☐ Yes ☐ Partial ☐ No	
Component 2 –SAFETY RISK MANAGEMENT			
Element 2.1 – Hazard identification process			
1	There is a process for voluntary hazards/ threats reporting by all employees.	☐ Yes ☐ Partial ☐ No	
2	Is the voluntary hazard/ threats reporting simple, available to all personnel involved in safety-related duties and commensurate with the size of the service provider?	☐ Yes ☐ Partial ☐ No	
3	Does the [organization's] have procedures for incident/ accident reporting by operational or production personnel?	☐ Yes ☐ Partial ☐ No	
4	Is incident/ accident reporting simple, accessible to all personnel involved in safety-related duties and commensurate with the size of the service provider?	☐ Yes ☐ Partial ☐ No	
5	Does the [organization] have procedures for investigation of all reported incident/ accidents?	☐ Yes ☐ Partial ☐ No	
6	Are there procedures to ensure that hazards/ threats identified or uncovered during incident/ accident investigation processes are appropriately accounted for and integrated into the organization's hazard collection and risk mitigation procedure?	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
7	Are there procedures to review hazards/ threats from relevant industry reports for follow up actions or risk evaluation where applicable?	☐ Yes ☐ Partial ☐ No	
Element 2.2 – Safety risk assessment and mitigation			
1	Is there a documented Hazard Identification and Risk Mitigation (HIRM) procedure involving the use of objective risk analysis tools.	☐ Yes ☐ Partial ☐ No	
2	Are the risk assessment reports approved by departmental managers or higher level where appropriate?	☐ Yes ☐ Partial ☐ No	
3	Is there a procedure for periodic review of existing risk mitigation records?	☐ Yes ☐ Partial ☐ No	
4	Is there a procedure to account for mitigation actions whenever unacceptable risk levels are identified?	☐ Yes ☐ Partial ☐ No	
5	Is there a procedure to prioritise identified hazards for risk mitigation actions?	☐ Yes ☐ Partial ☐ No	
6	Is there a program for systematic and progressive HIRM performance of all aviation safety-related operations/ processes/ facilities/ equipment as identified by the organization?	☐ Yes ☐ Partial ☐ No	
Component 3 –SAFETY ASSURANCE			
Element 3.1 – Safety performance monitoring and measurement			
1	Are there identified safety performance indicators for measuring & monitoring safety performance of the organization's aviation activities?	☐ Yes ☐ Partial ☐ No	
2	Are safety performance indicators relevant to the organization‘s safety policy as well as management‘s high level safety objectives/ goals?	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
3	Do the safety performance indicators include alert/ target settings to define unacceptable performance regions and planned improvement goals?	☐ Yes ☐ Partial ☐ No	
4	Is the setting of alert levels or out of control criteria based on objective safety metrics principles?	☐ Yes ☐ Partial ☐ No	
5	Do the safety performance indicators include quantitative monitoring of high consequence safety outcomes (e.g. accident & serious incident rates) as well as lower consequence events (e.g. rate of non-compliance, deviations)?	☐ Yes ☐ Partial ☐ No	
6	Are safety performance indicators and their associated performance settings developed in consultation with, and subject to the Aviation Authority‘s agreement?	☐ Yes ☐ Partial ☐ No	
7	Is there a procedure for corrective or follow up action to be taken when targets are not achieved and alert levels are exceeded/ breached?	☐ Yes ☐ Partial ☐ No	
8	Are the safety performance indicators periodically reviewed?	☐ Yes ☐ Partial ☐ No	
Element 3.2 – The management of change			
1	Is there a procedure for review of relevant existing aviation safety related facilities and equipment (including any HIRM records) whenever there are pertinent changes to those facilities or equipment?	☐ Yes ☐ Partial ☐ No	
2	Is there a procedure for review of relevant existing aviation safety related operations and processes (including any HIRM records) whenever there are pertinent changes to those operations or processes?	☐ Yes ☐ Partial ☐ No	
3	Is there a procedure for review of new aviation safety related operations and processes for hazards/ risks before they are commissioned?	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
4	Is there a procedure for review of relevant existing facilities, equipment, operations or processes (including any HIRM records) whenever there are pertinent changes external to the organization such as regulatory/ industry standards, best practices or technology?	☐ Yes ☐ Partial ☐ No	
Element 3.3 – Continuous improvement of the SMS			
1	Is there a procedure for periodic internal audit/ assessment of the SMS?	☐ Yes ☐ Partial ☐ No	
2	Is there a current internal SMS audit/ assessment plan?	☐ Yes ☐ Partial ☐ No	
3	Does the SMS audit plan include the sampling of completed/ existing safety risk assessments?	☐ Yes ☐ Partial ☐ No	
4	Does the SMS audit plan include the sampling of safety performance indicators for data currency and their target/ alert settings performance?	☐ Yes ☐ Partial ☐ No	
5	Does the SMS audit plan cover the SMS interface with sub-contractors or customers where applicable?	☐ Yes ☐ Partial ☐ No	
6	There is a process for SMS audit/ assessment reports to be submitted or highlighted for the Accountable Manager's attention where appropriate.	☐ Yes ☐ Partial ☐ No	
Component 4 – SAFETY PROMOTION			
Element 4.1 – Training and education			
1	Is there a program to provide SMS training/ familiarization to personnel involved in the implementation or operation of the SMS?	☐ Yes ☐ Partial ☐ No	
2	Has the Accountable Executive undergone appropriate SMS familiarisation, briefing or training?	☐ Yes ☐ Partial ☐ No	

ICAO reference	*Aspects to be analyzed or question to be answered*	*Answer*	*Status of implementation*
3	Are personnel involved in conducting risk mitigation provided with appropriate risk management training or familiarisation?	☐ Yes ☐ Partial ☐ No	
4	Is there evidence of organization wide SMS education or awareness efforts?	☐ Yes ☐ Partial ☐ No	
Element 4.2 – Safety communication			
1	Does the organization participate in safety information sharing with relevant external industry product and service providers or organizations, including the relevant aviation regulatory organizations?	☐ Yes ☐ Partial ☐ No	
2	There is evidence of a Safety (SMS) publication, circular or channel for communicating Safety (SMS) matters to employees.	☐ Yes ☐ Partial ☐ No	
3	Are the organization's SMS manual and related guidance materials accessible or disseminated to all relevant personnel?	☐ Yes ☐ Partial ☐ No	

AIMS Aviation Safety Module

1. Introduction

The establishment and maintenance of a safety database provides an essential tool for monitoring system safety issues.

Information that has been grouped together in an organized manner can be considered to be a database. However, storage, recording and retrieval of records using paper-based systems is cumbersome and will suffice for only small operations.

ICAO in its SMM recommends - *Safety data should preferably be stored in an electronic database that facilitates the query of records and generation of analysis output in a variety of format.*

National regulatory requirement as per DGCA CAR on '**Establishment of a Safety Management System (SMS)**' states that – '*A service provider shall develop and maintain formal means for effectively collecting, recording, acting on and generating feedback about hazards in operations, which combine reactive, proactive and predictive methods of safety data collection'.*

Also, as per para 10.1.2 of DGCA CAR – '*A service provider shall develop and maintain safety data collection and processing systems (SDCPS) that provide for the identification of hazards and the analysis, assessment and mitigation of safety risks'.*

C-SMS Manual of AAI also states – '*Each aerodrome/ location must establish a single compiled HAZLOG/ Hazard Register, which contains all the active hazards of the airport*.

AIMS has been chosen as the medium, in which Aviation Safety Directorate has developed "**AIMS for aviation safety" module** for collection and management of safety data base electronically.

"AIMS for aviation safety module" has i) Voluntary reporting form and VRS Portal, ii) HAZLOG Portal (AAI-SAF-127) , iii) Causal factor Portal, iv) Safety Training portal, v) Safety Audit portal and vi) Occurrence portal.

2. Purpose

The need for online Aviation Safety Directorate Module was envisaged to meet regulatory requirement as mentioned above and thereby create an electronic data base of hazards and safety related information of AAI managed airports that facilitates query on hazards other safety information and its analysis and report generation. The system will also help in standardizing and simplifying SRM process.

3. Description of various portal available under "AIMS for Aviation Safety module" :-

a) **Voluntary reporting form & VRS Portal**: Voluntary reporting form is an online facility available for all stake holders i.e. Airlines, other agencies, in aviation industry and AAI employees to report any safety hazard /occurrence at AAI airports/Civil enclaves and ANS centers. The details about the Voluntary reporting form and VRS portal are given in para 7.2.7 and para 7.2.8 of C-SMS manual.

b) **HAZLOG Portal**: HAZLOG portal is a centralized system for compiling all active hazards of the stations in standard HAZLOG template (AAI-SAF-127).
Each active hazard along with its consequences, initial risk assessment (with existing risk control), Residual risk with potential risk control as carried out in HAZID form can be summarized & documented in an objective manner in a HAZLOG (AAI-SAF-127) register along with action officer for implementation of potential risk control, current status & review date.
Hazards which are removed from the HAZLOG register (AAI-SAF-127), on elimination or closed, are transferred to the safety library of the airport.

Refer para 8.5.2 of this manual for guidelines for maintaining HAZLOG register.

c) **Causal Portal**: - This portal contains the data base on causal and contributary factors of incidents.

d) **Occurrence portal**: This portal is used at the Airport level for reporting of air traffic service (Including CNS) & airport operations incidents by the ATS in-charge/WSO. At RHQ/ CHQ level, this portal contains the data base of reported incidents.

e) **Audit Portal**: This portal is used to complete Safety audit process including generation of audit reports and RCA by audit teams of RHQ/CHQ. The portal also has provision for submitting ATRs by the Airport Directors /CIC/OIC on the RCA .

f) **Safety Training portal:** This portal is used to record the safety training data at station level and RHQ/CHQ level.

The user manual of AIMS portal is available on the portal itself.

4. Procedure

The different portals of the AIMS for aviation safety have three levels of access:

a) **Airport Level**:
Aviation Safety Dte. portals can be accessed by APD/CIC/OIC, HoD (CNS/ATM/Engg. and Ops), Station Safety Manager, WSO/SSO/Duty Operation Manager of the airport.

b) RHQ Level: Can be accessed by RED, GM (ATM/CNS/Engg./Ops) and Regional Safety Manager..

c) CHQ Level:
Can be accessed by ED (Aviation Safety/Ops/ATM/CNS/Engg.), GM (Aviation Safety/ATM/CNS/Ops/Engg).

SMS IMPLEMENTATION PLAN

Airport Name: (Ref. DGCA CAR SECTION 1 – GENERAL SERIES 'C' PART I Issue III, 24th March 2012) updated on date……

Sl. No.	CAR Ref.	Task Name	Quarter 1 20…	Quarter 2 20…	Quarter 3 20…	Quarter 4 20….	Quarter 1 20…	Quarter 2 20….	Quarter 3 20….
1.	Phase-1 (At the time of Application for AOP)	a) Identify SMS accountable executive.							
		b) Establish SMS implementation team.							
		c) Define scope of the SMS.							
		d) Perform SMS gap analysis.							
		e) Develop SMS implementation plan.							
		f) Establish key person/office responsible for the administration and maintenance of the SMS.							
		g) Establish SMS training program for personnel, with priority for the SMS implementation team.							
		h) Initiate SMS/safety communication channels.							
2.	Phase-2 (At the time of Application for AOP)	a) Establish safety policy and objectives.							
		b) Define safety management responsibilities and accountabilities across relevant departments of the organization.							
		c) Establish SMS/safety coordination mechanism/ committee.							
		d) Establish departmental/divisional SAGs where applicable.							
		e) Establish emergency response plan.							
		f) Initiate progressive development of SMS document/manual and other supporting documentation							
3	Phase-3 (+ 18 Months of Phase-2)	a) Establish voluntary hazard reporting procedure							
		b) Establish safety risk management procedures.							
		c) Establish occurrence reporting and investigation procedures.							
		d) Establish safety data collection and processing system for high-consequence outcomes							
		e) Develop high consequence SPIs and associated targets and alert settings.							
		f) Establish management of change procedure that includes safety risk assessment.							
		g) Establish internal quality audit program.							
		h) Establish external quality audit program.							

Sl. No.	CAR Ref.	Task Name	Quarter1 20…	Quarter 2 20…	Quarter 3 20…	Quarter 4 20….	Quarter 1 20…	Quarter 2 20….	Quarter 3 20….
4.	**Phase-4** (+ 18 Months of Phase-3)	a) Enhance existing disciplinary procedure/ policy with due consideration of unintentional errors or mistakes from deliberate or gross violations.							
		b) Integrate hazards identified from occurrence investigation reports with the voluntary hazard reporting system							
		c) Integrate hazard identification and risk management procedures with the sub-contractor's or customer's SMS where applicable.							
		d) Enhance safety data collection and processing system to include lower consequence events							
		e) Develop lower-consequence SPIs and associated targets/alert settings.							
		f) Establish SMS audit programs or integrate them into existing internal and external audit programs.							
		g) Establish other operational SMS review/ survey programs where appropriate.							
		h) Ensure that SMS training program for all relevant personnel has been completed.							
		i) Promote safety information sharing and exchange internally and externally.							

Reference DGCA AD AC Circular No. 1 of 2012 (Annexure 1)

FORM FOR COMMUNICATING WITH DGCA FOR ANY CHANGE PROJECT IN AN AERODROME

SECTION 1: AERODROME DETAILS

Aerodrome Name: ..... …..
Aerodrome Address: .....Pin Code: .....
Accountable Manager: Name: .....
Tele/Mob/Fax: …….....Email: .....
Project Manager: Name:
.....
Tele/Mob/Fax:…….....Email: .....

SECTION 2: PROJECT DETAILS

Title of Project:
.....
Reason for Change:.....
Brief Description:
Planned Commencement of Works:
…….....
Planned Duration of Works:
.....
Estimated Completion Date:
.....
Aerodrome Closed during Work in Progress? YES/ NO .....(if NO, please specify Hours of Work, below)
Hours of Work:
.....

SECTION 3: SAFETY/ RISK ASSESSMENT DETAILS

Stage of the Project: …….
(Design /Concept / Execution / Commissioning level)

Overall Outcome of the Safety Assessment: ……..……..……..
(Minor/ Moderate/ Major etc.)
The details of the documents enclosed with the safety assessment (appropriate to the safety outcome)as required by Aerodrome Safety Management Service.

1. ……
2. ……
3. ……
4. ……
5. ……
6. ……

SECTION 4: (FOR DESIGN/ CONCEPT LEVEL ASSESSMENT AND 'IN PRINCIPLE APPROVAL ONLY)

Is any non-compliance with the CAR specification (Yes/No)…….

If yes above, please give the details and reason of non-compliances and enclose exemption application with required documents as per the CAR on the subject.

Total Number of Risks Identified: ……

Number of New Mitigation Methods Recommended in Risk Assessment: …….
(Enclose documentary evidence to prove the implementation of the above mitigation methods)

Whether the issue of AIP Supplement (AIRAC) required: Yes/ No: ……..
If Yes above, Attach a draft AIP Supplement for approval.

SECTION 5: (FOR EXECUTION/ COMMENCEMENT OF WORK ONLY)

'In Principle' approval reference number granted by DGCA: ……

Total Number of Risks Identified: ……..

Number of New Mitigation Methods Recommended in Risk Assessment: …….
(Enclose documentary evidence to prove the implementation of the above mitigation methods)

Details and duration of the area closed in the movement/ Airside area:

……

……

SECTION 6: (FOR COMMISSIONING OF THE FACILITY AFTER COMPLETION OF THE WORK)

'In Principle' approval reference number granted by DGCA: …….

'Work Execution' approval reference number granted by DGCA: ……..

Proposed date of Commissioning: ……..

Details of the Promulgation of the information on the facility (AIP Supp/AIRAC/NOTAM): ……

Total Number of Risks Identified: ……..

Number of New Mitigation Methods Recommended in Risk Assessment: …….
Enclose documentary evidence to prove the implementation of the above mitigation methods)
Details of the Non Compliances with DGCA CAR, if any: ……..
Status of the approval for the above Non-Compliances: ……
(Give details of the application and approval reference if already granted).

(Signature of Accountable Executive)

Dated: Name:_____

Designation:_____

Project/Operational Risk Register

Date of Opening _____

Station:_____ Unit/Project_____

To be filled by Reporter					To be completed by Project Manager/Safety Manager after risk assessment in AAI-SAF-105									
ID/ S. No.	Date of Report-ing	Reporter/ Source	Hazard description	Worst credible effect and reasons (Consequences)	Existing control	Initial Risk Category	Potential Controls	PDC	Action Officer	Residual Risk Category	Accepting Authority	Status	Review Date	Remarks

AVIATION SAFETY AUDIT REPORT			REPORT DATED	
Station:		**Region:**		
Conducted by CHQ/RHQ			Audit Period	

Checklist - 1

Air Traffic Management

Sl. No.	Reference	Aspects	Observations	Comments
ATM (Training, Ratings & Standardization)				
1	DGCA CAR SECTION-9 SERIES-L, PART V para 5.1,5.2	**Whether Updated Refresher training record are maintained.** a) Frequency		
		b) Last training date		
		c) Contents		
		d) Records		
2	Generic/approved RTM May 2021 para 2.11	**Whether OJTI/ Rating record are maintained.** a) Frequency		
	MATS I para 3.6.17	b) Does the ATS provided for each ATC unit including airspace classification, airspace designation, airspace jurisdiction, hours of operation and type of services are published in AIP INDIA.		
3	Generic/approved RTM May 2021 para 8.2.3	**Whether Standardization record are maintained.** a) Proficiency check (local &External) [frequency / record / last Date]		
	MATS I para 3.13.13	b) Performance check. [freq. / record / last Date]		
	MATS I para 3.22.4.1 (10)	c) Random tape transcript analysis & corrective Training [freq. / record]		
	Generic/approved RTM para 2.3.2	d) English language proficiency (Individual record)		
	Generic/approved RTM para 10.1.1	e) Availability of current Class-3 medical assessment of individual ATCO.		
4	Ops circular 05/2011	Inspection of Runway, taxiway, apron, maneuvering area (Frequency & Records of Inspection.)		

5	DGCA CAR SECTION 8 SEIRES C part-1, para 6	Is there any Low visibility operation at the airport? If yes, whether LVP is developed &Documented		
6	DGCA CAR SECTION 4 SERIES B PART I para 5.1.3.1 & 5.3.3.3	Is the aerodrome having light & visual signal facility? (type/performance) a) ALDIS Lamp b) Aerodrome beacon		
7	MATS I Chap -10, para 10.5 MATS I para 10.7 ICAO, Annex-11, (July 2018) Para 2.17 MATS I para 10.1.2	**Is Co-ordination Procedures are documented with: -** a) military authorities		
		b) MET		
		c) Airside operation		
		d) contiguous control Areas (LOA)		
8	MATS- I, Para 7.14.8	Whether AGL Status indicators control panel in Control Tower is available.		
9	ICAO,Annex-11,(July 2018) Para 7.3	Whether Operational status indicator of Nav. Aids/ Landing Aids in Control Tower is available. a) DVOR b) HPDME c) NDB d) ILS _Glide Path e) ILS_ Localizer f) LP DME		
10	ICAO, Annex-11, (July 2018) Para 7.1.4	Arrangement for Meteorological Information to Tower. Availability & performance of MET Equipment: a) METAR b) RVR panel c) Wind panel		
11	ICAO Annex-11, (July 2018) Para 4.3.4/4.3.5	Performance of ATIS / DATIS		
12	ICAO Annex-11, (July 2018) Para 6.1	**Communication facilities (Air-ground)** a) Type VHF [Main & standby freq.] b) emergency freq. 121.5 MHz		
13	Doc 4444, Para 8.1	**Surveillance facility (AUTOMATION/RADAR/ ADS):**		
		a) Redundancies (No. of scopes including Standby scope) b) Any Target drop in the coverage area		
14	DGCA CAR Sec 4,	**Operational Area**		

	Series-B, Part-1, Para 9.5 ICAO DOC 9981 appendix 4 to chapter 9	**Apron management** a) Does SOP for bay allotment available. b) Does Aerodrome Vehicle Control procedure (ADP/SOP) available.		
15	ICAO DOC 9426 para 2.4.4	Is Operational area complexity like Apron design/Parking guidance / TWY etc. causing any Problem?		
16	DGCA CAR Sec-9, Ser.-G, Part-1, issue-II Para 1.3.3	**Does Maps & Charts / Essential information are displayed properly at prominent place.** a) Aerodrome data b) Aeronautical chart & maps c) Aerodrome Layout, d) SID, STAR, e) TMA, f) 30 Nm Obstruction charts, g) Aerodrome Operating minima, h) freq./Nav. Aid Location, i) Apron layout, j) Grid map, k) Emergency Action & Crash action board) l) Currency/integrity / proper display		
17	ICAO Annex 11 (July 2018) para 2.26.2	**Does Equipment/Instruments are Displays in Control tower** a) Watch [position w.r.t. each operating procedure]		
	ICAO Annex 14 para 18.5.1	b) Fire bell (receiver-fire station, Airport Manager Office, CISF control room & AHO)		
	Annex 14 attachment A para 18.5.1	c) Crash Siren		
	ATS Aerodrome Planning Manual para 2.1.2	d) Binocular		

	ICAO Annex 11(July 2018) para 2.18.3 ICAO Annex 14 para 18.5.1	**e) Ground-Ground communications** With Military unit - Fire station - City fire station - Apron control **f) Ground-Ground communication equipment:** - telephones - intercoms/DSC - hot lines - walkie-talkie, - Internet facility - AFTN (AMSS)		
18	Doc 4444, Para 2.5 (e)	Daily check & record of equipment, facilities & Instruments in the unit		
19	MATS 1, Para 3.14.3	**Does relevant documents are available either physical or digital copy:** a) AIP India & AIP Supplements b) Manual of air Traffic Services Part 1 & 2 c) DOC 4444 d) Annex-11, Annex-2, Annex- 14 e) Coordination procedures/LOAs f) relevant AICs g) NOTAMs		

		h) Relevant DGCA Circulars/Civil Aviation Requirement (CAR) i) ATMCs j) Station Standing Instructions/ Circulars k) Aerodrome Manual along with all the relevant SOPs l) Station Level SOP for handling of VVIP Flights m) Search & Rescue Manual n) AIS Manual o) Document Management Manual p) All Airport Emergency/ Contingency Plans q) Station Safety Management Manual r) Updated status on Aviation Safety Audit Report & DGCA inspection Report		
20	MATS 1, Para 3.14.3	**Whether Updated Contingency/ Emergency Plans are available:** a) AEP b) Bomb Threat c) Search & Rescue Manual d) Unlawful Interference e) Building &Tower Fire Evacuation plan f) Handling of dangerous goods g) Disable aircraft removal		

		h) Disaster management i) ATS contingency plan (With alternate ATC site)		
21	CAR Section 9, Series E Part-I Para 2.32, Att. C PQ. 7.153 CAR Section 9, Series E Part-I Att C Para 4.2	a) Whether contingency plan exists for implementation in the event of disruption, or potential disruption, failure or degradation of air traffic services and related supporting services? b) Whether the contingency plan identifies a contingency tower/alternate ATC site & contains relevant standard operating procedures? c) Whether the contingency tower/alternate ATC site has VHF, basic communication facilities, essential display of important information, maps & charts? d) Whether the contingency plans address natural disasters and public health emergencies?		
22	DGCA CAR Sec-4 Series.-X Part-I	**Measure to minimize Runway Incursions: -** a) Is Runway safety team available and record of meeting and ATR available. b) Does any hot spots identify?		

23	ATS Aerodrome Planning Manual Para 2.2.1.8	**Is Work Environment satisfactory:** a) View of operational area b) View of vicinity c) No. of surveillance equipment d) Ambient temperature e) Ambient lighting f) Noise level g) Exterior glare		
24	DGCA CAR Sec-9, Ser.-E, Part-1, Issue-II Para 2.26 MATS 1 para 8.23.3.1 Annex 11 para 7.1.2.1 ATS Aerodrome Planning Manual para 1.3.6	**Availability of Miscellaneous Facilities in ATS units:** a) Clock (time in UTC) b) FPS board c) WX display d) Emergency lighting e) Fire alarm/extinguisher f) Internet facilities		
25	ICAO Annex 11(July 2018) para 2.24.3	**Is Anti- Hijacking room (Check serviceability and availability of) are properly maintained.**		
		a) Location (Isolation bay visible or not)		
		b) Facilities		
		c) VHF Frequencies		
		d) Hotlines		
		e) Direct speech circuit		

		f) Intercom		
		g) Telephone lines		
		h) Maps / charts (updated)		
		i) Contact List of Aerodrome committee /CMG Etc. (updated)		
26	DGCA CAR SECTION 5 SERIES F PART IV	Does Psychoactive substances test are being conducted.		
27	DGCA CAR SECTON 5 SERIES F PART IV	Does Breathing analysis test are conducted and records are maintained.		
28	Doc 9426 Para 2.3.2	Whether essential information has been displayed for ready reference: TWR a) Grid Map b) Crash Action Board c) Emergency Actions Checklist/folder d) List of Medical Practitioners		
29	DOC 9426 PART IV Sec 2 para 1.8 CAR Sec 1,Series-c ,Part-I, Para 3.19	a) Whether all ATS Log Books and runway inspection Log book are maintained properly? b) Whether appropriate Watch taking- over and handing-over procedures are followed, including necessary briefing and equipment serviceability check? c) Whether logbooks are being reviewed and		

		counter-signed by ATS-In-charge/WSO? d) Whether safety related entries are recorded & analyzed as part of safety data?		
30	CAR Section 9, Series E Part-I Para 3.6	Whether appropriate coordination procedures exist between a) Aerodrome Control Tower & Approach Control Unit b) Approach ControlUnit & Area Control Centre c) Aerodrome Control tower and Area Control Center		
31	CAR SECTION 4 SERIES B PART 1 PARA 9.8,	Confirm the surface movement guidance and control system (ASMGCS) available, fulfilling the design requirement of the following: a) Density of air traffic; b) Visibility conditions; c) Pilot orientation; d) Complexity of aerodrome layout; e) Movements of vehicles;		
32	CAR SECTION 4 SERIES B PART1 PARA 2.13	Check the validity of coordination / arrangement between aeronautical information service & aerodrome operator for providing up-to-date pre-flight information.		

33	CAR Section 9, Series E Part-I Para 5.1.3	Whether oceanic control unit is notifying Rescue Coordination Centers when an aircraft is considered in state of emergency in accordance with the different phases (INCERFA, ALERFA, DISTRESFA)?		
34	CAR Section 9 Series E Part 1 Para 6.2.2.2.1 CAR Section 9 Series E Part 1 Para 6.2.3.1	a) Whether oceanic control center has facilities for communication with other units-military units, met office, aero telecom station, appropriate operator office, RCC, international NOTAM office? b) Whether oceanic control center has facilities for communications with all adjacent oceanic control centers, flight information centers and area control canters?		
35	CAR Section 9 Series D Part VI Para 4.1.3.1.2 CAR Section 9 Series E Part 1 Para 6.2.2.2.1 CAR Section 9 Series E Part 1 Para 6.2.2.1	a) Whether emergency frequency 121.5 Mhz has been provided & monitored in FIC. b) Whether flight information center has facilities for communication with other units-military units, met office, aero telecom station, appropriate operator office, RCC, international NOTAM office? c) Whether flight information Centre has communication facilities with all other units for intra-unit coordination?		

36	CAR Section 9 Series E Part 1 Para 2.1.3.3 and ANSS AC 4 of 2017-ATM, Doc 4444 Para 3.1.1.2, PQ.7.081	Whether ANSP has developed policies and procedures for determining ATS System Capacity, including number of ATCOs needed? (i)Whether ATS System Capacity (for control areas, for control sectors within a control area and for aerodromes) and Airport Acceptance Rate (AAR) has been assessed and declared?		
		(a) Declared ATS System capacity (b) Declared AAR? ii) Assessed Manpower Strength (iii) Actual Strength (iv) Watch-hours (v) No. of Operational Shifts (vi) No. of controllers per shift (vii) No. of movements per day		
37	CAR Section 9 Series E Part 1 Para 3.7.5.1, Doc 4444 Para 3.1.1.2 and Para 3.1.1.3, PQ. 7.082	(i) Whether ATFM has been implemented for airspace when air traffic demand at times exceeds, or is expected to exceed, the declared capacity of the air traffic control services concerned? (ii) if ATFM is not implemented, (a) Whether procedures have been established to ensure traffic volumes and associated controller workloads do not		

		exceed defined, safe levels? (b) Whether procedures are in place for regulating traffic volumes whenever necessary?		
38	Miscellaneous Observations			

Checklist - 2

AIRPORT OPERATIONS

Sl. No.	Reference	Aspects	Observations	Comment s
	RWY Orientation of RWY(s) APRON GOA AIRPORT			
	CAR SEC 4 SERIES B PART I ISSUE II PARA 2.7 Pre-flight altimeter check location			
1	PARA 2.7.1	Whether pre-flight altimeter check locations are established?		
	PARA2.7.2	Where is the location of Pre-flight marking-? Apron/TXY?		
	CAR SEC 4 SERIES B PART I ISSUE II PARA 2.9 Condition of the movement area and related facilities			
2	PARA 2.9.5&6	How are the flight crew notified for the Runway surface condition?		
	CAR SEC 4 PARA 2.9.9	Whether the process of notifying the surface condition is included in the RWY Condition Assessment Worksheet?		
	PARA 2.9.10	Whether the RWY Condition Assessment Worksheet is completed? (Observation I , II&III.)		
3	PARA 3.1	**Number and orientation of RWYs**		
	PARA 3.1.5, 3.1.6, 3.1.7, 3.1.8, 3.1.9,	Whether the RWY threshold is displaced? (Permanent/temporary)		

	PARA 3.1.23, DOC 9137 PT-8 CHAPTER 7	What is the last date of friction test and Coefficient value?		
	PARA 3.1.13 & 3.1.19	Whether the slope condition (longitudinal & transverse) are satisfactory?		
4	PARA 3.1.22	**Surface of RWY. (Rubber deposit/condition)**		
5	PARA 3.2	Whether the shoulders are as per the DGCA CAR? (width, slopes, strength & surface condition).		
6	PARA 3.3.6	**Is the RWY turn pads design as per DGCA Car?**		
7	PARA 3.4.2	**Whether the strips extend before beyond end of the RWY or stop way for a distance at least 60m where the code 2,3&4?**		
	PARA 3.4.3 and 3.4.4	Whether strip including a Precision /non-precision approach RWY is as per the DGCA CAR?		
	PARA 3.4.5	Whether strip including a non-instrument WY is as per the DGCA CAR?		
	PARA 3.4.7	Whether the fixed object sited on the strip for use of visual aids and air navigation services are satisfying the relevant frangibilityrequirement?		
		Grading of RWY. strips		
8	PARA 3.4.8	Whether portion of a strip of an instrument RWY is graded?		

	PARA 3.4.9	Whether portion of a strip of an non-instrument RWY is graded?		
	PARA 3.4.17	Whether the strength of RWY Strip portion is as per the DGCA CAR?		
	PARA 3.5.	Whether the RESA is provided and the length is minimum 90 mts and width of a RESA is at least twice that of instrument RWY?		
	PARA 3.5.7	Whether RESA is clear and graded for aeroplane which the RWY is intended to serve?		
	CAR SEC 4 SERIES B PART IISSUE II PARA 3.9 Taxiways			
9	PARA 3.9.4	**Width of TWY.** Whether the straight portion of a TWY is provided as per the DGCA CAR?		
	PARA 3.9.12	Whether the strength of TWY surface is at least equal to that of the RWY it serves?		
	TWY. SHOULDERS:- PARA- 3.10.1	Whether the Straight portions of a TWY is provided with shoulders which extend symmetrically on each side of the TWY?		
10	PARA 3.11.4	**Whether the center portion of the TWY is graded as per the DGCA CAR?**		

11	PARA-3.12.6	Whether the distance between holding bay, WY HP established at a TWY /RWY intersection or road-Hand the center line of the RWY are provided as per the DGCA CAR?		
		CAR SEC 4 SERIES B PART I ISSUE II PARA 3.14 Isolated aircraft parking position		
12	PARA-3.14.2	Is the isolated aircraft parking position located at the maximum distance practicable and in any case never less than 100 m from other parking positions?		
		CAR SEC 4 SERIES B PART I ISSUE II PARA 5.1.1 Wind Director Indicator (WDI)		
13	PARA 5.1.1.1	An aerodrome shall be equipped with at least one WDI?		
	PARA 5.1.1.2	Is the WDI located at a sight to as to be visible from aircraft in flight or in movement area" & free from air disturbance?		
	PARA 5.1.1.3	Is the Truncated Cone of WDI of **3.6 m** and more in length and the diameter of larger end is of **0.9 m** or more?		
		If the WDI is of two colour, the combination of two colours is: Orange and White, Red and White or Black and White?		
	PARA 5.1.1.4	Is the WDI (Wind Direction Indicator) base marked by Circular Band **15m in diameter and 1.2m wide?**		

	PARA 5.1.1.5	Is the WDI illuminated, if an aerodrome is intended for use at night?		
CAR SEC 4 SERIES B PART I ISSUE II PARA 5.1.2 Landing Direction Indicator (LDI)				
14.	**PARA 5.1.2.1**	If provided, is the Landing Direction Indicator located at a conspicuous place?		
	PARA 5.1.2.3	Is the colour of Landing T is either white or orange?		
CAR SEC 4 SERIES B PART I ISSUE II PARA 5.1.3 Signaling lamp				
15	**PARA 5.1.3.1.**	Whether signaling lamp provided at a controlled aerodrome in the aerodrome control tower?		
	PARA 5.1.3.2	Whether signaling lamp capable of producing red, green and white signals?		
CAR SEC 4 SERIES B PART I ISSUE II PARA 5.1.4				
Signal panels and signal area (mandatory for the aerodromes used only for VFR operations)				
16.	PARA 5.1.4.1	Whether signal area is located so as to be visible for all angles of azimuth above an angle of 10° above the horizontal when viewed from a height of 300 m?		
	PARA 5.1.4.2	Whether signal area is an even horizontal surface at least 9 m square?		

	PARA 5.1.4.3	Whether the colour of the signal area is in contrast with the colours of the signal panels used, and surrounded by a white border not less than 0.3 m wide?		
		CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2. MARKINGS		
17.	PARA-5.2.1.4	Are all the RWY markings, white in colour?		
	PARA 5.2.1.5	Are the TWY markings, RWY turn pad markings and aircraft stand markings yellow in colour?		
	PARA5.2.1.6	Is the apron safety line of conspicuous colour which contrast with that used for aircraft stand markings?		
	PARA 5.2.1.7	Are pavement markings made with reflective materials designed to enhance the visibility of the markings (for aerodromes where operations take place at night)?		
		CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.2. RWY Designation Marking		
	PARA 5.2.2.1	Is the RWY designation marking provided at the threshold of the paved RWY?		
	PARA 5.2.2.3	Is the RWY designation marking 12m from the edge of threshold marking?		
		Is the RWY designation marking of 9m in length?		

	PARA 5.2.3.2	Is the RWY center line marking 12m from the RWY designation marking at each end?		
	PARA 5.2.3.3	Is the length of the stripe plus gap in between? 50m and 75m?		
		Is the length of the stripe 30m minimum?		
19	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.4 THRESHOLD MARKING**			
	PARA 5.2.4.4 &5.2.4.5	Is the stripe of Threshold marking commencing 6m from the threshold?		
	PARA 5.2.4.6	Are the stripe of at least 30m long and approx. 1.8m wide?		
		Is the gap between two stipes of approx. 1.8?		
		Is a double spacing provided between stripes nearest to the center line of RWY?		
	PARA 5.2.4.8	Is the transverse stripe, if provided of 1.8 m wide? (Where RWY extremity not Square shape)		
21	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.5 Aiming Point Marking**			
	PARA 5.2.5.3	Is the beginning of Aiming Point marking co-incident with the visual approach slope origin?		
	PARA 5.2.5.4	Is the lateral space between aiming point marking of same as that of Touch Down Zone marking?		
22	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.6 Touch Down Zone Marking**			
	PARA5.2.6.4	Is the TDZ marking commencing 150m from the threshold?		

		Is the longitudinal spacing between the beginning of each TDZ marking 150M?		
23	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.7 RWY Side Stripe Marking**			
	PARA 5.2.7.5	Is the RWY side stripe marking overall width of at **least 0.9 m on RWY 30m or more of width** and at least 0.45 m on narrower RWYs?		
24	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.8 Taxiway C/L Marking**			
	PARA 5.2.8.4	Whether the TXY C/L marking are provided?		
	PARA 5.2.8.5	Whether enhanced TXY intersection C/L marking are provided?		
	PARA 5.2.8.7	Whether the TWY C/L marking is extended parallel to the RWY C/L marking for a distance of at least 60m/30m beyond the point of tendency.		
	PARA 5.2.8.10	Is the width of TWY C/L marking of at least 15cm and continuous in length? Whether the HP marking on TXY are provided as per CAR?		
25	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.9 RWY Turn Pad Marking (Yellow)**			
	PARA 5.2.9.1	Whether a continuous guidance to enable an aero plane to complete 1800 and align with the RWY C/L marking on the turn pad is provided?		
	PARA 5.2.9.3	Turn pad marking should align & run parallel with RWY C/L up to distance 60m.		

	PARA 5.2.9.7	Is the RWY turn pad marking of 15cm in width and continuous in length?			
26	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.12 VOR aerodrome check-point marking.**				
	PARA 5.2.12.4	Whether VOR aerodrome check-point marking has been provided consisting a circle of 6 m in diameter and has a line width of 15 cm?			
	IPARA 5.2.12.6	Whether VOR aerodrome check point marking is white in colour?			
27	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.13 Aircraft stand markings**				
	PARA 5.2.13.1	Whether Aircraft stand markings has been provided for designated parking positions on a paved apron?			
	PARA 5.2.13.3	Whether Aircraft stand markings include such elements as stand identification, lead-in line, turn bar, turning line, alignment bar, stop line and lead out line, as are required by the parking configuration and to complement other parking aids?			
28	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.14 Apron safety lines**				
	PARA 5.2.14.1	Whether Apron safety lines is provided?			
	PARA 5.2.14.4	Whether apron safety line is continuous in length and at least 10 cm in width?			
29	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.15 Road-holding position marking**				
	PARA 5.2.15.1	Whether road-holding position marking has been provided at all road entrances to an RWY?			

	PARA 5.2.15.2	Whether road-holding position marking has been located across the road at the holding Position?			
	CAR SEC 4 SERIES B PART I ISSUE II PARA 5.2.16 Mandatory instruction marking				
	PARA 5.2.16.6	Whether a mandatory instruction marking are consist of	Yes		
	5.3.3 Aeronautical beacons				
30	PARA 5.3.3.6	Whether the frequencies of total flashes of aeronautical beacon is from 20 to 30 per minute?			
	CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.4 Approach lighting systems				
	PARA 5.3.4.2	**Simple approach lighting system**			
		Whether Simple approach lighting system is provided for both RWYs as per DGCA Car?			
	PARA 5.3.4.3	Whether the cross bar 30 m, gap on each side of center line not to exceed 6m Spacing for the cross-bar lights between 1m to 4m are provided?			
	CAR SEC 4 SERIES B PART I	Whether the Precision approach category I lighting system is provided?			
31	PARA 5.3.5.24	**PAPI** Whether PAPI has been provided?			
		If yes, the system shall be located on the left side of the RWY unless it is physically impracticable to do so.			
32	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.9 RWY edge lights**				
	PARA 5.3.9.3	Whether RWY edge lights have been placed along the full length of the RWY?			

	PARA 5.3.9.4	Whether RWY edge lights have been placed along the edges of the area declared for use as the RWY or outside the edges of the area at a distance of not more than 3m?		
33	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.10 RWY threshold lights**			
	PARA 5.3.10.1	Whether Threshold Lights and RWY edge lights are provided?		
34	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.11 RWY end lights (Mandatory for RWY with RWY edge light)**			
	PARA 5.3.11.2	Whether RWY end lights have been placed on a line near to the end of the RWY as possible and, in any case, not more than 3 m outside the end?		
35	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.12 RWY center line lights**			
	PARA 5.3.12.1	Whether the RWY center line lights are provided on a precision approach RWY category II or III?		
36	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.16 Stop-way lights**			
	PARA 5.3.16.1/2/3	Whether the Stop-way light are provided in full length of stop-way, in coincident with row of RWY edge lights?		
37	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.18 Taxiway edge lights**			
	PARA 5.3.18.2	Whether TXY edge lights and TXY C/L lights are provided?		
38	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.19 RWY turn pad lights**			
	PARA 5.3.19.3	Whether the RWY turn pad lights are located on the RWY turn pad marking?		

	PARA 5.3.19.6	Whether the RWY turn pad lights are unidirectional fixed lights showing green with beam dimensions such that the light is visible only from aeroplane on or approaching the RWY turn pad?		
	PARA 5.3.20.1-5.3.20.12	Are stop bars provided at the aerodrome? Are they controlled by air traffic services?		
	PARA 5.3.20.1-5.3.20.12	Are the stop bars specified as components of an advanced surface movement guidance and control system at airport?		
	PARA 5.3.20.1-5.3.20.12	Are stop bar provided at every RWY- holding position serving a RWY when it is intended that the RWY will be used in RWY visual range less than a value of 550 m?		
	PARA 5.3.23	Check Whether the RWY. guard lights are provided?		
39	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.24 Apron flood lighting**			
	PARA 5.3.24.1	Whether the Apron flood lighting are provided?		
	PARA 5.3.24.4	Whether the adequate illumination in all apron area are available?		
	PARA-5.3.25	1. Whether location of VDGS are satisfactory? 2. Whether azimuth guidance unit and stopping position indicator are adequate for use in all whether, visibility, background lighting and pavement conditions? 3. Whether VDGS is usable by all types of aircraft for which the aircraft stand is intended?		
	PARA- 5.3.26	Whether advance visual docking guidance system (A- VDGS) is provided		

40	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.3.28 Road-holding position light**			
	PARA 5.3.28.1/2/3	Whether road-HP light is provided at each road Holding Position?		
41	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.4 Signs**			
	PARA 5.4.1.3	Whether the Signages are frangible and sufficiently low near the RWY or taxiway?		
42	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.4.2 Mandatory instruction signs**			
	PARA 5.4.2.2	Whether Mandatory instruction signs, such as RWY designation signs, category I, II or III holding position signs, RWY-holding position signs, road- holding position signs and NO ENTRY signs, have been provided?		
43	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.4.3 Information signs**			
	PARA 5.4.3.2	Whether the Information signage are including Direction sign, location sign, destination sign, RWY exit sign, RWY vacated sign & Intersection Take-off sign?		
	PARA 5.4.3.25/26/27	Whether the Information sign are in BLACK letter with YELLOW back ground? Whether the Location signs are in YELLOW letter with BLACK back ground?		
44	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.4.4 VOR aerodrome check-point sign**			
	PARA 5.4.4.3	Whether A VOR aerodrome check-point signage provided near VOR check point location? it should be visible from Cockpit and consist of an inscription in black on a yellow background.		
	CAR SEC 4 SERIES B PART I ISSUE II PARA 5.4.5 Aerodrome identification sign			

	PARA 5.4.5.1/2/3/4/5	Whether Aerodrome Identification Sign has been provided?		
45	**CAR SEC 4 SERIES B PART I ISSUE II PARA 5.4.6 Aircraft stand Identification sign**			
	PARA 5.4.6.1/2/3	Whether aircraft stand identification marking are provided?		
	CAR SEC 4 SERIES B PART I ISSUE II CHAPTER 6 VISUAL IDS FOR DENOTING OBSTACLES			
	CAR SEC 4 SERIES B PART I ISSUE II PARA 6.1 Objects to be marked and/or lighted			
46		Whether Vehicles and other mobile objects are lighted?		
	CAR SEC 4 SERIES B PART I ISSUE II PARA 7.2 Non-load-bearing surfaces			
47	PARA 7.2.1	Whether the side strips of marking of Shoulders for taxiways, RWY turn pads, holding bays and aprons are provided?		
		Whether the TXY side stripe marking are consist of a pair of solid lines, each 15 cm wide?		
	CAR SEC 4 SERIES B PART IISSUE II PARA 7.3 Pre-threshold area			
	PARA 7.3.2	Whether the chevron marking is provided?		
	PARA 7.3.3	Whether the pre-threshold marking is provided?		
	CAR SEC 4 SERIES B PART I ISSUE II CHAPTER 9. AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATIONS			
	CAR SEC 4 SERIES B PART I ISSUE II PARA 9.5 Apron management service			
	CAR SEC 4 SERIES B PART I ISSUE II PARA 9.10 Fencing			

49	PARA-9.1.13	Check the process for testing the emergency plan: • Whether full-scale aerodrome emergency exercise is conducted at intervals not exceeding two years? • Whether partial emergency exercises are conducted in the intervening year to ensure that any deficiencies found during the full-scale aerodrome emergency exercise have been corrected and reviewed?		
50	PARA-9.4.1	Whether the wildlife hazard management programme (WHMP)is available? Whether the roles and tasks of the executives are defined in the WHMP? Whether the procedures for collecting, reporting and recording data on wildlife strikes and observed wildlife are defined in WHMP?		
51	PARA-9.7 NOTE-1	Whether the procedures for the establishment of an airside driver permit (ADP) is available? .		
52		Whether the surface movement guidance and control system (SMGCS) available & fulfilling the design requirement?		
53	PARA 9.8.5	Whether the designed SMGCS system is assisting in the prevention of collisions between aircraft, and between aircraft and vehicles or objects, on any part of the movement area?		
54	PARA-9.9.	Whether any equipment or installation located on or near a strip penetrates the inner approach surface, inner transition surface or balked landing surface?		

55	CAR SEC 5 SERIES F PART IV ISSUE I PARA 5.1	Check whether at least 10% concerned operational personnel employed in in their respective operational departments are randomly subjected to breath-analyzer examination on a daily basis, when they report for the duty.		
	PARA 6.1	Check whether at least two serviceable breath-analyzer equipment capable of giving accurate digital value up to three decimal places with a memory to store and recall at least last 1000 records are available.		
	PARA 7.1	Whether Doctor holding MBBS degree / trained paramedics/Emergency Medical Technician (EMT)/Personnel holding BSC (Nursing)/Diploma (Nursing) are available to conduct the breath-analyzer examination at a designated place within the airport premises?		
	PARA- 8	Check action taken on positive test as Per Para 8 of the CAR.		
	PARA - 9	Check preservation of records as per para9 of the CAR.		
	OBSTACLE REGULATION & CONTROL PROCEDURES			
56	GSR 751 (E) AERODROME MANUAL	Check the arrangements for monitoring the height of buildings or structures within the boundaries of the obstacle limitation surfaces (OLS).		
57	GSR 751 (E) AERODROME MANUAL	Check the arrangements for controlling new developments in the vicinity of aerodromes.		
58	GSR 751 (E) AERODROME MANUAL	Check the reporting procedure and actions to be taken in the event of the appearance of unauthorized obstacles.		
59	GSR 751 (E) AERODROME MANUAL	Check the arrangements for removal of obstacles.		

60	DOC 9137, PT-7 CHAPTER 7, DOC 9137, PT-8 12.6 & 15.5	(i) check the date of last OLS survey carried. (ii) check the availability of current updated aerodrome charts: grid map, zoning map, type a & b and their date of publication.		

Checklist - 3

Communication, Navigation and Surveillance (CNS)

S.No.	List of CNS/ATM facility	Life Span in Years	No of Facilities	Date of Commissioning	Comments
1.	(a) VHF (Tx/Rx)	12			
	(b) VCCS	12			
	(c) DVTR/DVR	12			
	(d) DATIS	12			
	(e) HF(Tx/RX)	12			
	(f) AMSS	10			
	(g) ILS (LLZ,GP and LP-DME)	12			
	(h) DVOR	12			
	(i) HP DME	12			
	(J) NDB	12			
	(k) RADAR(ARSR)	12			

	(l) ASMGCS (SMR,MLAT, Processing System)	10			
	(m) ADS-B	12			
	(n) ATS Automation	10			
	(p) **COPS / UPS**				
	(i)Up to 5KVA	6			
	(ii)5 KVA to 20 KVA	8			
	(iii)More than 20 KVA	10			
	(q)Batteries* 2 years or as recommended by battery manufacturer, whichever is later.	02*			
2.	**VHF Communication System**	**Observations**		**Comments**	

2.1	VHF Radios		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
	Availability of emergency frequency 121.5 MHZ		
2.2	**RCAG**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability %		
2.3	**HF Radio and SELCALL**		
	Main equipment status (Serv/Unser)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)	--	
2.4	**Voice and Data Recording System (DVR)**		
	Main equipment status (Serv/Unserv)		
	Standby equipment status (Serv/Unserv)		

	Serviceability % (last one year)		
	ATS Playback System		
2.5	**Telephone**		
	Intercom Systems		
	Direct Telephone/ Hot lines		
2.6	**DATIS**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
2.7	**VCCS**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
2.8	**Automatic Message Switching system (AMSS)**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		

	Serviceability % (last one year)		
2.9	**Automatic Message Handling System (AMHS)**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
2.10	**NOTAM**		
	Availability of documents (Annex 15, Doc7910, AIC Circulars and AIP Supplement)		
2.11	**ASBS (Briefing)**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status(Serv/Unserv)		
	Serviceability % (last one year)		
3.	**Navigational facilities**		
3.1	**Instrument Landing System (ILS)**		
3.1.1	**Localizer**		
	Main equipment status (Serviceable/Unserviceable)		

	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
3.1.2	**Glide Path**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
3.1.3	**LP Distance Measuring Equipment (LP DME)**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
3.2	**HP Distance Measuring Equipment HP DME**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
3.3	**DVOR**		
	Main equipment status (Serviceable/Unserviceable)		

	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
3.4	**NDB**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability %(last one year)		
3.5	**CCTV and Access Control System For ANS**		
	Protection of Nav-Aids from vandalism/ theft: Monitoring of Nav-Aids sites and surveillance facilities is carried out by CCTV and Access Control System for ANS.		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability %		
4.	**Surveillance System**		
4.1	**ASR(PSR)**		

	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability %(last one year)		
	Remote Control and Status Monitoring (Telephone Lines/OFC/RF Link)		
4.2	**ASR(MSSR)**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability %(last one year)		
	Remote Control and Status Monitoring (Telephone Lines/OFC/RF Link)		
	Site Monitor		
	Radar Display Console/ SDD (serv/unserv)		
4.3	**ADS-B**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		

	Serviceability % (last one year)		
	ADS-B Console (Control and Monitoring)		
4.4	**ASMGCS**		
4.4.1	**MLAT**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
	Remote control and Status Monitoring (Telephone Lines/OFC/RF Link)		
	Display Console		
4.4.2	**SMR**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
	Remote control and Status Monitoring (Telephone Lines/OFC/RF Link)		

	Display Console/ SDD		
4.4.3	**Processor**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
5	**Automation System**		
	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
	Control and Monitoring		
	Display Console (Serv/Unserv)		
	Serviceability of LANS		
	Synchronous Recording/Playback		
	Status of CPME/PARROT on SDD		
5.1	**HF TX/RX**		

	Main equipment status (Serviceable/Unserviceable)		
	Standby equipment status (Serv/Unserv)		
	Serviceability % (last one year)		
	Remote/Local (Receiver)		
5.2	**Internet**		
	Serviceability % (last one year)		
5.3	**AHCR**		
	Availability and serviceability of Hotlines/ Intercom/telephone with STD/VHF/HF/Video conferencing facility etc.		
6.	**Process and Procedures**		
6.1	Reporting procedure for intimating breakdown of facilities available.		
6.2	Is there any lay down procedure of duty handing over and taking over?		
6.3	Is there any procedure of coordination with ATS operation about the equipment abnormality?		
6.4	SOPs are available for watch opening/closing and switching on/off the CNS facility.		

	References	Aspects	Observations	Comments
7.	CNS Equipment History			
	CNS Circular 10 of 2020 Para 4.2 & 4.3 (Procurement of Goods and services guidelines regarding recommended lifespan of ANS System)	Availability of life extension certificate, if equipment has completed its life span.		
8.	**Nav-Aids Status in Equipment Room and ATS Units and Failure analysis of CNS Facilities**			
	CNS Circular 03 of 2003 (Provision of Information of operational status of NAV-AIDS)	(a) Remote-control unit of Nav-aids is installed and functional at Equipment Room (RCSU)		
		(b)Remote status indication (RSU) is provided at all intended ATC units.		

	CNS Circular 09 of 2019 (Documentation and preservation of Maintenance of CNS/ATM Facilities), CNS Manual Vol-I chapter 11, (Performance target for CNS facility)	(c)The details of total number of failures (with duration) and MTBF/serviceability maintained by the station. (last one year)		
9.	**Regular/Preventive Maintenance Schedules of All CNS/ATM facilities.**			
	DGCA CAR Section-9, Series-D Part-1 Para 2 & 3.1 CNS Manual Vol-VII (Part- I to IV) CNS Circular 02 of 2009, CNS manual Vol-I, Chapter-3, Clause 8.4.1	(a) Approved preventive maintenance schedules are available and maintained for all the operational CNS/ATM facilities.		
		(b)Daily Schedule		
		(c) weekly Schedule		
		(d)Monthly Schedule		
		(e)Six monthly Schedule		
		(f)Check the pre-monsoon preventive maintenance is		

		carried out for all the operational CNS facilities.		
		(g)Availability of CNS Workshop for maintenance		
		(h)Availability of necessary tools/special tools to carry out appropriate Checks.		
		(i)Availability of static mats on ANS sites.		
10.		**Flight Calibration Status of Radio Nav-aids**		
	CNS Manual Volume IV Chapter-3	The flight Calibration of Nav-Aids is due? If yes, the copy of last calibration report.		
		(a)DVOR/DME		
		(b)ILS		
11.		**Manual/Documents Required**		
	CNS Manual Vol-I Chapter 8	(a) Is ICAO/DGCA CARs/CNS manual and other Guidance documents /Technical Manuals available at the station?		

		Annex-10 CARs Doc8071 Station CNS Manual/ CNS circular		
		(b) Is cable route diagrams available and routing is marked?		
		(c) Are Equipment manuals, drawings/troubleshooting Charts are available?		
12.	**Earthing, lightning and surge protection system**			
	CNS Manual vol – V Chapter 3, 4 & 5.	(a)Earthing is properly maintained at all the CNS/ATM facilities and earth resistance is checked regularly and recorded.		
		(b)The earthing pit are		

		properly marked.		
		(c)Availability of lightening and surge protection system at all CNS/ATM facilities as per latest guidelines		
13.	**Power Supply for CNS/ATM facilities**			
	CNS circular 02 of 2023. (Power supply for CNS/ATM Facilities) Para 4 to 8. Refer para 3.2 (a) of CNS circular 02 of 2023, Power supply policy for CNS/ATM facilities	(a)The availability of standby power supply (i.e. UPS and Battery backup) at all the CNS/ATM facilities is provided as per CNS Circular 02 of 2023.		
		(b) UPS under warranty/AMC and timely replacement of batteries		
		(c) Provision of redundancy in Power supply and UPS as per guidelines		
14.	**Fire Detection & Protection**			
	Provision for Fire Detection, Suppression	(a) Fire alarm and detection system with auto dialler		

	and Alarm System for CNS/ATM Facilities. CNS circular 03 of 2023.	facility and Fire Suppression System is installed and working satisfactorily.		
		(b) Fire extinguisher provided at all CNS facilities is regularly checked.		
15.	**Time in Air Traffic Services (Time synchronization status)**			
	CNS Circular No. 4 of 2003. (Time in Air Traffic Services)	(a)The synchronized time is available in different ATS operational units and different CNS facilities (eg. DVTR, VCCS, ATC Automation, AMSS/AMHS).		
		(b) The Source of time synchronization is either from GPS clock or from Automation.		
16.	**Recording and replay check**			
	CNS manual Vol. VI (Appendix 1.14)	(a) The recording and replay facility of voice/surveillance data is		

	DGCA CAR Section 9 Series E, Para6.1.1.3	available.		
		(b)The recorded data is preserved for last 30 days or as per latest guidelines.		
		(c) The synchronized recording and replay of voice and data in ATS Automation System.		
		(d)The quality of recording. is satisfactory.		
17.	**Calibration Status of test equipment**			
	CNS Circular 06 of 2019 (Maintenance and calibration of Test equipment's)	(a) All the test equipment's available at station are calibrated and its record is maintained at station.		
		(b) Availability of necessary tools/special tools to carryout appropriate checks/schedules.		
18.	**Training / Proficiency**			

	CNS Manual, Vol.-1, Chapter-3	(a)Is the staff deployed, for the operation and maintenance of the CNS /ATM facility proficient/ trained on the particular facility?		
		(b) The procedure for maintaining the competence of its personnel (refresher training, OJT programme) is available at the station.		
		(c)Availability of sufficient OJT Instructor at the station.		
		(d)Is the station maintaining training files/records for its executives?		
19.	**Frangible huts/Building**			
	CNS Circular 05/2022 CNS Manual Vol-VII Part-II CNS Circular 07/2004.	(a) The LLZ antenna, LLZ Hut, GP antenna, GP hut, LLZ/GP NFM antenna and DME LP antenna should be frangible.		
		(b)Frangible hut/ building should be sealed from all		

		side to prevent entry of any reptile such as rats, snakes etc. or seepage of water.		
		(c)Is the approach to the building clear of grass and other vegetation?		
20.	**Protected Area and its Maintenance**			
	Maintenance of Radio Navigational Aids sites and ILS Critical/Sensitive Area. Ref CNS Circular 09/2021. DGCA CAR Section 4,Series-B.	(a)Is DVOR area within 300-meter radius from the centre of Antenna of the facility protected?		
		(b) Grass cutting equipment or any other vehicle is not to be parked within protected area of DVOR.		
		(c) The height of grass, shrubs and other vegetation is restricted to		

		be 150 mm in the critical area of ILS and 600mm in case of DVOR/DME.		
		(d) For standalone DME, no structure should be on land above the level of 3 meters below the Antenna base up to a distance of 150 meters from the Antenna.		
		(e) Proper signage shall be provided to delineate the boundaries of critical and sensitive area of Navigational Aids. Sign boards shall be made of non-metallic material.		
21.	**Ambience**			
	CNS Manual Vol-VII	(a)Is the Equipment room/UPS room, meeting		

	Part-I CNS Circular No.02/2023 Attachment-II &III.	the environmental conditions for satisfactory equipment performance?		
		(b)Is Room temperature/ Humidity is maintained as per equipment technical manual?		
		(c)Are all the air conditioners functional?		
		(d)Is room dust proof (Check for window pane breakage, space between the door frames and doors)?		
		(e)Is the Thermal insulation in walls and roof sufficient to meet the temperature requirement of the equipment?		
22.	**Miscellaneous/ Additional observations**			

Checklist – 4

AERODROME RESCUE & FIRE FIGHTING (ARFF)

S. No.	REFERENCES	DESCRIPTION	OBSERVATIONS	REMARKS
DOCUMENTS (Availability of the ARFF-related records and documents)				
1.	Fire Safety Manual Clause 17.2.1	Updated Airport Emergency Plan		
2.	Fire Safety Manual Clause 17.34.1	Internal Grid Map with Distribution List		
3.	Fire Safety Manual Clause 17.34.2	External Grid Map with Distribution List		
4.	Fire Safety Manual Table 5.1 (140)	MOU with City Fire Brigade/Indian Coast Guard/IAF etc.		
5.	Fire Safety Manual Clause 5.3.1	Airport Disaster Management Plan (ADMP)		
6.	Fire Safety Manual Clause 12.3.1	Disabled Aircraft Removal Plan		
7.	Fire Safety Manual Clause 7.26.1	Joint monthly inspections of fire prevention & protection carried out by the team & records.		
8.	Fire Safety Manual 2015 Clause 7.27	Whether a work permit (Hot/Cold Work) system is implemented?		
9.	Fire Safety Manual Table 5.1 (145)	Occurrence Book		
10.	Fire Safety Manual Table 5.1 (146 & 152)	Drill/Training Register		
11.	Fire Safety Manual Clause 3.10.3	Defect Register - Vehicles & Equipment		
12.	Fire Safety Manual Table 5.1, (148)	Vehicle Log Book		
13.	Fire Safety Manual Table 5.1 (150)	Hose Register		

14.	Fire Safety Manual Table 5.1 (153)	Extinguisher Register		
15.	The following documents should be available in the Fire station: Fire Safety Manual 2015, Table No: 5.3 (11)	Anti-Hijacking Plan Bomb Threat Contingency Plan Aerodrome Manual SMS Manual Fire Safety Manual		
16.	Fire Safety Manual - Clause 7.1.2	Whether the NOC of the terminal building, Technical block (ATC Building) car parking, and Power House available?		
17.	Fire Safety Manual 2015 Clause - 3.10.8	Stock Register of all Items.		
18.	Fire Safety Manual 2015 Clause -7.23.2.2	Whether the hydraulic pressure test of the fire extinguisher has been done and its records have been Maintained before displaying in the building/area/unit etc.		
19.	Fire Safety Manual 2015 Clause -1.21.5	Records of basic fire safety training provided to the staff of other agencies working at the airport.		
20.	Fire Safety Manual 2015 Clause - 3.10.9.1	Station instruction /orders register		
FACILITIES				
21.	Fire Safety Manual Clause -17.8	Whether Rendezvous Points (RVP) is marked at The appropriate place?		

22.	Fire Safety Manual Clause 6.1.10	Whether the manoeuvring area is clearly visible from the Fire Watch Tower?		
23.	Fire Safety Manual Clause - 6.3 ICAO 9137/898 Part-1 – Clause - 9.3.5	Condition of the Fire station building and basic facilities.		
24.	Fire Safety Manual Clause 6.3.8	The fire Watch Tower is fitted with tilted- antiglare glass.		
25.	Fire Safety Manual Clause 6.2.5	Whether the floor of the fire station garages is designed as per yardstick		
26.	Fire Safety Manual Clause 6.3.10	Whether the fire station has an essential electrical power supply?		
27.	Fire Safety Manual Clause 3.1.2	Whether the Fire Station clean, presentable and maintain a professional appearance at all time?		
28.	Fire Safety Manual Clause - 6.5.5	Whether the hydrant near the static tank available?		
29.	DGCA CAR SEC. 4 SERIES B PART Clause 9.2.16	Whether facility for expeditious replenishment of rescue and fire fighting vehicles is available?		
30.	Fire Safety Manual Clause 6.6	Condition of the Fire pit.		
31.	Fire Safety Manual Clause 2.1.9	What mitigation measures are taken (if the aerodrome is located close to water/ swampy areas, or difficult terrain)?		
32.	Fire Safety Manual Table No. 6.6 & 6.7	Whether the Gym facilities available in accordance with AAI FSM?		

33.	CAR SEC. 4 SERIES B PART 1 Clause 9.1.8	Whether a mobile command post (MCP) is available at the airport?		
34.	DOC 9137-AN/898 PART 7 Clause - 5.2.3	Serviceability status of the communication and electronic devices fitted in MCP?		
35.	DOC 9137-AN/898 PART 7, 5.3.5	Are the Maps, charts and other relevant equipment, items and information available at the mobile command post?		
36.	DGCA CAR SEC. 4 SERIES B PART 1 Clause 9.1.16	Whether the access to the approach and departure areas within 1,000 m from the runway threshold is available?		
37.	Fire Safety Manual Clause 6.4.3	Whether Emergency Access Road is available?		
38.	Fire Safety Manual Clause 6.9	Whether the record of the crash gate periodic Is inspection available?		
39.	DOC 9137-AN/898 PART 1 Clause 3.2.4	Whether the Emergency gates marked as per the yardstick?		
40.	Fire Safety Manual Clause 6.8.3 (VI)	Whether the keys to the emergency gate kept in ARFF vehicles?		
41.	Fire Safety Manual Clause - 6.4.1	Whether the fire station to the Runway approach the road directly and clearly?		
42.	Fire Safety Manual Clause 6.10.4 (6)	Mike & Speaker for training classroom.		
43.	Fire Safety Manual Clause 6.10.4 (7)	Binoculars for the watch tower.		

EMERGENCY MEDICAL CENTRE (EMC)/FIRST AID ROOM (FAR)				
44.	DOC 9137-AN/898 PART 7 Clause -9.3	Availability of Triage identification tags for sorting the injured casualties?		
45.	Fire Safety Manual Clause 12.34.4	Availability of disposable gloves and masks.		
46.	Fire Safety Manual Table 6.12 (15)	Are the Coffin bags available at the Emergency Medical Centre as per the yardstick?		
47.	Fire Safety Manual Clause 3.10.6.2	Whether the records of medicine available and properly maintained?		
48.	Fire Safety Manual Clause 6.11.5	Whether the Emergency Medical Centre Building connected with approach roads to the runway, apron, and city side?		
49.	Fire Safety Manual Clause 6.13.7	Is the continuous supply of drinking waterwith proper filtration & treatment available?		
50.	Fire Safety Manual Clause 6.13.8	Is there a provision for cold and hot water in all bathrooms at EMC?		
51.	Fire Safety Manual Clause 6.14.8	Whether the EMC/FAR is provided with the essential power supply?		
52.	Fire Safety Manual Clause 6.16	Availability of the Communication Systems in EMC?		
53.	Fire Safety Manual Table 6.11 (3)	Availability of oxygen cylinders as per yardstick?		
AIRPORT TERMINAL BUILDING/TECHNICAL BLOCK				
54.	Fire Safety Manual Clause 17.31.4	Are assembly point locations marked?		
55.	Fire Safety Manual Clause 7.8.6	Are fire protection systems in auto mode?		
56.	Fire Safety Manual Clause 7.9.5	Whether the Fire exit floor plan display conspicuously posted on each floor clearly the routes to appropriate exits?		

57.	Fire Safety Manual Clause 7.10.4	Whether all emergency exits clear and free from obstructions?		
58.	Fire Safety Manual Clause 7.10.6	Whether there is a proper display of exit signage in the terminal building?		
59.	Fire Safety Manual Clause 7.26.2	Is the maintenance Record of periodical testing of Fire dampers and blower interlocking available?		
60.	Fire Safety Manual Clause 7.21.7	Are all fire protection systems, including hydrants, fire pumps, and alarm systems, and their records available?		
61.	Fire Safety Manual Clause 7.20.3	A gaseous automatic fire suppression system should be provided for unmanned CNS/ATM equipment sites/ installations.		
62.	Fire Safety Manual Clause 7.20.4	Are the Fire extinguishers installed as per BIS:2190?		
63.	Fire Safety Manual Clause 7.25.1	Whether the serviceability of the automatic fire detection/alarm system is being ensured and records are being maintained in the Building FireControl Room?		
		ARFF VEHICLES AND EQUIPMENT		
64.	Fire Safety Manual Clause 3.6.7	Whether the record of periodic testing of all ACFTs and equipment available?		
65.	Fire Safety Manual Table 5.1 (26)	Does the foam induction system work properly?(Testing dates to be provided)		
66.	Fire Safety Manual TABLE-2.3	Whether the required numbers of ACFTs and ambulances available to meet the requirementas per the yardstick?		
67.	Fire Safety Manual TABLE 2.4	Whether BA compressor to refill SCBA (Self-contained breathing apparatus) sets are availableas per yardstick?		

68.	Fire Safety Manual Table 2.4	Whether the Fire proximity suits are available asper the yardstick?		
69.	Fire Safety Manual Table 2.4	Whether the Hydraulic Units with spreader andcutter are available as per yardstick?		
70.	Fire Safety Manual Table 2.4	Whether the Power-Driven Saws are available as per yardstick?		
71.	CAR SEC.4 SERIES B PART1, Clause 9.2.23	Whether spare nitrogen cylinders available?		
EXTINGUISHING MEDIA				
72.	Fire Safety Manual Table 6.2	Whether the availability of overhead and static watertank capacity as per yardstick?		
73.	Fire Safety Manual Table 5.1 (151)	Whether the availability of extinguishing media commensurate with Table 2.5 and the media stock		
ARFF MANPOWER				
74.	CAR SEC. 4 SERIES B PART1 Clause 9.2.45	Whether updated Task Resource Analysis (TRA) incorporated in the aerodrome manual?		
75.	Fire Safety Manual Chapter 14	Whether Records of PET & PEFT Records available?		
76.	Fire Safety Manual Table No: 5.1 (123)	Whether all firefighting vehicle drivers certified ascompetent on the vehicle entrusted to them?		
TRAINING, DRILLS, AND EXERCISE				
77.	Fire Safety Manual Clause 3.5.1	Provide a record of monthly Hot Fire Drills		
78.	Fire Safety Manual Clause 3.5.1	Did the emergency drills are carried out in nighttime /bad weather?		
79.	Fire Safety Manual Clause 3.7.1	Provide records of Tabletop Exercises.		
80.	Fire Safety Manual Clause 3.9.2	Provide records of Full-Scale Emergency Exercises.		
81.	Fire Safety Manual Clause 3.8.1	Provide records of Partial Emergency Exercise.		

82.	Fire Safety Manual Clause 7.26.5	Provide records of airport familiarization training.		
83.	Fire Safety Manual Table No: 5.1 (126)	Provide records of aircraft familiarization training.		
84.	Fire Safety Manual Clause 3.4.4	Provide records of target hit practice.		
85.	Fire Safety Manual Table No:5.1 (124)	Provide records of dangerous goods training.		
86.	CAR SEC. 4 SERIES B PART1 Clause 9.2.42	Provide records of Fire staff trained on pressure-fedfuel fire.		
87.	CAR SEC. 4 SERIES B PART 1 Clause 9.2.43	Provide records of Fire staff trained on Human Factor Principles.		
88.	DOC 9137-AN/898 PART 7 Appendix 3 Clause 6	Provide records of first aid training and validity of allfire staff.		
89.	Fire Safety Manual Clause 3.10.11.1	Whether training is properly documented inindividual training records?		
90.	Fire Safety Manual Clause 3.9.1	Whether updated Building evacuation drill plan isavailable?		
91.	Fire Safety Manual Clause 3.9.1	Provide a record of Building Evacuation drills.		
COMMUNICATION SYSTEM				
92.	Fire Safety Manual 2015 Table 6.10.1(08)	Whether Internet /Intranet facility available in the fire station?		
93.	Fire Safety Manual Table 6.3 (01)	Whether the Public Address (PA) System availablein the Fire Station?		
94.	Fire Safety Manual Table 6.3 (02)	Crash bell is available in the fire station?		
95.	Fire Safety Manual Table 6.3 (03)	Are hotlines from City Fire Brigades to FWT and FWT to ATC available/ as per AEP?		
96.	Fire Safety Manual Table 6.310.4(8)	Whether a megaphone is available?		

97.	Fire Safety Manual Table 6.3 (6 and 7)	Whether RT is fitted in each ARFFV?		
GENERAL OBSERVATIONS				
98.				
99.				
100.				
101.				

Checklist – 5

ELECTRICAL

S NO	REFRENCE	DESCRIPTION	Civil Aviation Requirements (CAR)	To be submitted by the respective airports	Observations by the Auditor	Remarks if any
1.	CAR Series B, Part 1, Section 4, para 8	ELECTRICAL POWER SUPPLY SYSTEM - CHANGE OVER TIME				
I	CAR Series B, Part 1, Section 4, Table 8.1	For Non-Precisions Approach Runway Aeronautical all Ground Lights	15 Seconds			
II	CAR Series B, Part 1, Section 4, Table 8.1	For Precision Approach Category 1, Runway all Aeronautical Ground Lights	15 Seconds			
III	CAR Series B, Part 1, Section 4, Table 8.1	For Precision Approach II & III, Runway Aeronautical Ground Lights				
		I. Runway Edge Lights	15 Seconds			
		II. Essential Taxiway lights	15 Seconds			
		III. Approach Light beyond 300 mts from threshold	15 Seconds			
		IV. Inner 300 mts of approach lights	1 Second			
		V. Runway Centre line lights	1 Second			
		VI. Runway Threshold/end lights	1 Second			
		VII. Runway touchdown zone lights	1 Second			

		VIII. All stop bars	1 Second			
2.	CAR Series B, Part 1, Section 4, Chapter 10	Serviceability of Aeronautical Ground Lighting System				
(i)	CAR Series B, Part 1, Section 4, 10.5.7	During any period of category II or III operations, all approach and runway lights are serviceable. Additionally, an unserviceable light shall not be permitted adjacent to another unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted and that in any event at least:				
		I. Precision approach category II and III lighting system, the inner 450 m;	95%			
		II. Runway centre line lights;	95%			
		III. Runway threshold lights; and	95%			
		IV. Runway edge lights;	95%			
		V. Touchdown zone lights	90%			
		VI. Approach lighting system beyond 450 m	85%			
		VII. Runway end lights	75%			

II	CAR Series B, Part 1, Section 4, 10.5.10	During any period of category I, all approach and runway lights are serviceable, Additionally, an unserviceable light shall not be permitted adjacent to another unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted and that in any event at least:				
		I. Precision approach category I lighting system;	85%			
		II. Runway threshold lights;	85%			
		III. Runway edge lights; and d)	85%			
		IV. Runway end lights.	85%			
(III)	CAR Series B, Part 1, Section 4, 10.5.12	For a runway meant for take-off in runway visual range conditions of a value of 550 m or greater, during any period of operations, all runway lights are serviceable in the runway edge lights and runway end lights. In order to provide continuity of guidance, an unserviceable light shall not be permitted adjacent to another unserviceable light	85%			
(IV)	CAR Series B, Part 1, Section 4, 10.5.1	The Minimum main beam average intensity should not fall below the specified in the appropriate figure in Appendix 2 of the CAR.	50%			

(V)	CAR Series B, Part 1, Section 4, 10.5.3 & 10.5.6	The system of preventive maintenance employed for a precision approach runway category II or III shall include at least the following checks,	Not less than twice in a year for pavement lights and not less once a year for other lights.			
		I. Visual inspection and in-field measurement of the intensity, beam spread and orientation of lights included in the approach and runway lighting systems				
		II. Control and measurement of the electrical characteristics of each circuitry included in the approach and runway lighting systems				
		III. Control of the correct functioning of light intensity settings used by air traffic control.				
3.	CAR Series B, Part 1, Section 4, 10.5.4	In-field measurement of intensity, beam spread and orientation of lights included in approach and runway lighting systems for a precision approach runway category II or III shall be undertaken by measuring all lights, as far as practicable, to ensure	Yes/No and report thereof			

		conformance with the applicable specification of Appendix 2 of this CAR.				
4.	CAR Series B, Part 1, Section 4, 10.5.5	Measurement of intensity, beam spread and orientation of lights included in approach and runway lighting systems for a precision approach runway category II or III shall be undertaken using a mobile measuring unit of sufficient accuracy to analyse the characteristics of the individual lights.	Yes/No and report thereof			
5.	CAR Series B, Part 1, Section 4, 1.1 definitions	Switch-over time (light). The time required for the actual intensity of a light measured in a given direction to fall from 50 per cent and recover to 50 per cent during a power supply changeover, when the light is being operated at intensities of 25 per cent or above.	Yes/No and report thereof			
6.	CAR Series B, Part 1, Section 4, 8.1.3	Electric power supply connections to those facilities for which secondary power is required should be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.	Yes/No and report thereof			
7.	CAR Series B, Part 1, Section 4, 5.3.24	The average illuminance at the Apron shall be at least the following:				

		(a) Aircraft stand:				
		I. Horizontal illuminance — 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and	20 Lux/5 Lux and latest report of measurement			
		II. Vertical illuminance — 20 lux at a height of 2 m above the apron in relevant directions.	20 Lux/5 Lux and latest report of measurement			
		(b) Other apron areas:				
		I. Horizontal illuminance- 50 per cent of the average illuminance on the aircraft stands with the uniformity ratio (average to minimum) of not more than 4 to 1.	10 Lux/2.5 Lux and latest report measurement			
8.	DGCA CAR Section 4 series B Part 1, para 5.4.13	Illuminated/ Non-illuminated Signs Frangibility	Fragile / Not Fragile / Partially Fragile			
9.	CAR Series B, Part 1, Section 4, para 5.3.25 & 5.3.26	The A-VDGS shall provide, at minimum, the following guidance information at the appropriate stage of the docking manoeuvre:	Report of latest Calibration/ Inspection and report thereof			

		I. An emergency stop indication;	Yes/No			
		II. The aircraft type and model for which the guidance is provided;	Yes/No			
		III. An indication of the lateral displacement of the aircraft relative to the stand centre line, the direction of azimuth correction needed to correct a displacement from the stand centre line;	Yes/No			
		IV. An indication of the distance to the stop position;	Yes/No			
		V. An indication when the aircraft has reached the correct stopping position; and a warning indication if the aircraft goes beyond the appropriate stop position.	Yes/No			
		VI. The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table 5-4 of the CAR.	Yes/No			

10.	CAR Series B, Part 1, Section 4, para 8.1.10	Secondary Power Supply to Air navigation services is fed through Two Independent Power Sources	Yes/No			
11.	CAR Series B, Part 1, Section 4, para 8.3.2 & 8.5.3	Automatic monitoring of lights for fault detection is available in ATC.	Yes/No			
12.	CAR Series B, Part 1, Section 4, para 8.3.3	Change in the operational status of all individual AGL lights is available in ATC.	Yes/No			
13.	CAR Series B, Part 1, Section 4, para 8.3.4	Automatic fault detection to Maintenance Crew for AGL system is available as per table 8 and para 10.5.7 - 10.5.11 of the CAR compliance	Yes/No			
14.	CAR Series B, Part 1, Section 4, Chapter 5	**Confirm the Installation and specification compliance of the CAR provisions for S No 15 to Sr No 45 below.**	Available – Compiled/Not			
15.	DGCA CAR Section 4 series B Part 1, para 5.3.11.	Runway End lights	Available – Complied/ Not Complied or Not Available			
16.	DGCA CAR Section 4 series B Part 1 para 5.3.9	Runway edge lights	Available – Complied/ Not			

			Complied or Not Available			
17.	DGCA CAR Section 4 series B Part 1 para 5.3.8 & 5.3.10	Runway Threshold Lights	Available – Complied/ Not Complied or Not Available			
18.	DGCA CAR Section 4 series B Part 1 para 5.3.16	Runway Stop Lights	Available – Complied/ Not Complied or Not Available			
19.	DGCA CAR Section 4 series B Part 1 5.3.19	Runway Turn Pad Lights	Available – Complied/ Not Complied or Not Available			
20.	DGCA CAR Section 4 series B Part 1 5.3.18	Taxiway edge lights	Available – Complied/ Not Complied or Not Available			
21.	DGCA CAR Section 4 series B Part 1 para 5.3.5.24 -5.3.5.46	PAPI Lights	Available – Complied/ Not Complied or Not Available			

22.	DGCA CAR Section 4 series B Part 1 para 5.3.4.2 - 5.3.4.9	Simple approach lighting system	Available – Complied/ Not Complied or Not Available			
23.	DGCA CAR Section 4 series B Part 1, para 5.3.4.10 - 5.3.4.21	CAT-I lights	Available – Complied/ Not			
24.	DGCA CAR Section 4 series B Part 1, para 5.3.4.22 - 5.3.4.39	Cat II & III Lights	Available – Complied/ Not			
25.	DGCA CAR Section 4 series B Part 1 - para 5.3.24	Apron Flood Lights	Available – Complied/ Not Complied or Not Available			
26.	DGCA CAR Section 4 series B Part 1, 5.3.28	Road-holding position lights	Available – Complied/ Not Complied or Not Available			
27.	DGCA CAR Section 4 series B Part 5.3.13 & 5.3.14	Runway touchdown zone lights	Available – Complied/ Not Complied or Not Available			

28.	DGCA CAR Section 4 series B Part 1, para 5.3.15	Rapid exit taxiway indicator lights	Available – Complied/ Not Complied or Not Available			
29.	DGCA CAR Section 4 series B Part 1 para 5.3.12	Runway centre line lights	Available – Complied/ Not Complied or Not Available			
30.	DGCA CAR Section 4 series B Part 1 para 5.3.17	Taxiway centre line lights	Available – Complied/ Not Complied or Not Available			
31.	DGCA CAR Section 4 series B Part 1 , para 5.1.1	Wind Direction Indicators	Available – Complied/ Not Complied or Not Available			
32.	DGCA CAR Section 4 series B Part 1 , para 5.1.2	Landing Direction Indicator	Available – Complied/ Not Complied or Not Available			
33.	DGCA CAR Section 4 series B Part 1 , para 5.1.3	Signalling lamp	Available – Complied/ Not Complied or Not Available			

34.	DGCA CAR Section 4 series B Part 1, para 5.3.1.6	Elevated runway, stop way and taxiway lights shall be frangible.	Available – Complied/ Not Complied or Not Available			
35.	DGCA CAR Section 4 series B Part 1, para 5.3.20	Runway Stop Bars	Available – Complied/ Not Complied or Not Available			
36.	DGCA CAR Section 4 series B Part 1, para 5.3.21	Intermediate holding position lights	Available – Complied/ Not Complied or Not Available			
37.	DGCA CAR Section 4 series B Part 1, para 5.3.23	Runway guard lights	Available – Complied/ Not Complied or Not Available			
38.	DGCA CAR Section 4 series B Part 1, para 5.3.27	Aircraft stand manoeuvring guidance lights	Available – Complied/ Not Complied or Not Available			
39.	DGCA CAR Section 4 series B Part 1, para 5.3.28	Road-holding position light	Available – Complied/ Not Complied or Not Available			

40.	DGCA CAR Section 4 series B Part 1, para 5.3.29	No-entry bar	Available – Complied/ Not Complied or Not Available			
41.	DGCA CAR Section 4 series B Part 1, para 5.3.30	Runway status lights (RWSL)	Available – Complied/ Not Complied or Not Available			
42.	DGCA CAR Section 4 series B Part 1, para 5.4.2	Mandatory instruction signs	Available – Complied/ Not Complied or Not Available			
43.	DGCA CAR Section 4 series B Part 1, para 5.4.3	Information signs	Available – Complied/ Not Complied or Not Available			
44.	DGCA CAR Section 4 series B Part 1, para 5.4.6	Aircraft stand identification signs	Available – Complied/ Not Complied or Not Available			
45.	DGCA CAR Section 4 series B Part 1, para 5.4.7	Road-holding position sign	Available – Complied/ Not Complied or Not Available			

Part 2: - Central Electricity Authority (CEA) Regulations Compliance Audit Check Points						
46.	CEA Regulation- 3	Register of designated persons along with their qualification and competency certificate or work permit issued by the competent authority be maintained. The certificate or work permit should be attested by the concerned Engineer-in-Charge of the work.	E I C attested the work permit – Yes/No			
47.	CEA Regulation-19(5)	Insulating mat conforming to IS-15652:2006 should be available in the front and back side of all Electrical panels.	Available /Not Available/Partially Available			
48..	CEA Regulation- 30	Periodical Safety Inspection of Power House should be carried out as per CEA regulations.	Latest Inspection Date and report of inspection – Available/ Not Available			
49.	CEA Regulation-45(1) i	Circuit Breakers/Isolators should be Interlocked, in case of Power Supply from more than One Source.	Interlocking – Manual/ Mechanical / Electronical			
50.	CEA Regulation-45(1) ii	Circuit Breakers/Isolators should be Interlocked, in case of Earth switch is provided.	Interlocking – Manual/ Mechanical / Electronical			
51.	CEA Regulation-45(2)(i)	Over current relay protection should be provided as per norms	Available/Not Available			

52.	CEA Regulation-45(2)(ii)	Earth fault or leakage protection should be provided as per norms	Available/Not Available			
53.	CEA Regulation-45(2) iii	Transformer winding and Oil temperature tripping and alarm should be provided as per norms	Available/Not Available			
54.	CEA Regulation-41(xii)	All Electrical panels and equipment's should be provided with two separate and distinct earth connections	Available/Not Available			
55.	CEA Regulation-41(xiii)	Transformers and DG Sets should have Neutral – two separate and distinct connections.	Available/Not Available			
56.	CEA Regulation-44(2)(vii) c	Spare Oil should not be stored in the vicinity of the Oil filled Equipment in the Sub-Station.	Complied/ Not Complied			
57.	CEA Regulation-19(2)	Every person working on Electrical system shall be provided all the safety tools as per the requirement under this regulation.	Complied/ Not Complied			
58.	CEA Regulation-19(5)	All non-current carrying metal parts of electrical equipment shall be properly earthed with double earthing source and shall have insulating floors or Insulating mat as per IS: 15652:2006	Complied/ Not Complied			
59.	CEA Regulation-19(6)	All panels shall be painted with description of its identification at front and rear of the panel, both sides.	Complied/ Not Complied/ Partially Complied			

60.	CEA Regulation- 44 - 2(XII)	Cable trenches are covered with inflammable trench covers.	Complied/ Not Complied/ Partially Complied			
61.	CEA Regulation- 28 (1)	Proper Shock Treatment Chart duly framed in Hindi, English & Local Language should be displayed at all required locations of Power House.	Complied/ Not Complied/ Partially Complied			
62.	CEA Regulation- 28(3)	Artificial respirator should be made available in the Power House	Complied/ Not Complied			
63.	CEA Regulation- 27 (3)	First aid box shall be kept in Sub-station with all required medicines/tools/bandages etc and the Designated persons should be trained on first aid practices by Govt. authorized agencies or AAI empanelled hospital.	Available/ Not Available			
64.	CEA Regulation- 27 (3)	Updated Single line diagram of power distribution system should be displayed in the Power House and in all switch rooms.	Available/ Not Available			
65.	CEA Regulation- 27(2)	Fire extinguishers shall be tested as per the OEM recommendations periodically and record of the testing shall be tagged with the extinguishers.	Complied/ Not Complied			
66.	CEA Regulation- 27 (1)	Fire buckets with clean and dry sand shall be kept in the sub-stations in addition to the Fire extinguishers.	Available/ Not Available			

Part 3 :- AAI Technical Instructions and other Circulars Compliance Audit Check Points						
67.	T.I.93 dtd.26/3/2013	Power supply for GLF should be separated with any other power supply with adequate standby arrangements.	Complied/ Not Complied/ partially Complied			
68.	T.I. 3, dtd 6/2/2007	Conventional type protection system should be provided especially for CCR/Power house Building.	Complied/ Not Complied/ partially Complied			
69.	T.I. 3, dtd 6/2/2007	In Electrical panels form where Power Supply is drawn to induvial CCRs surge protection is to be provided.	Complied/ Not Complied/ partially Complied			
70.	T.I. 3, dtd 6/2/2007	Soundness of Lightning to be checked as a part of pre-monsoon check.	Checked / Not Checked and reports thereof			
71.	T.I. 3, dtd 6/2/2007	Earth continuity to be checked of all GLF light Fittings before Monsoon.	Checked / Not Checked and reports thereof			
72.	T.I. 3, dtd 6/2/2007	The leads of lightning arrestors at the output Circuit of CCRs shall be separated and provided with backlight sleeves so that the leads are not short circuited during lightning, to prevent of lightning induced surges to the CCRs.	Complied/ Not Complied / Partially Complied			
73.	T.I. 12, dtd 20/2/2008	Testing of DG sets and change over from load to DG Set and DG Set to Load shall	Complied / Not Complied and reports thereof			

		be done only in presence of a responsible AAI Engineer.				
74.	T.I. 12, dtd 20/2/2008	DG set to be tested once in a month for Four Hours continuous Run at full Load/max available Load to ensure reliability.	Complied / Not Complied and reports thereof			
Part 4 :- General Observations on Operational Facilities/Services during the Audit						
75.	AGL Failure during the preceding One year	Failures of AGL/Year (Rwy Edge Light, PAPI, Approach Light,Centre Line, Touchdown Zone Light, End /Threshold Light & any other AGL installed at the airport.	…….nos/Year			
76.	PS Failure for ANS	Total number of Power Supply failures for ANS Facilities	….nos/Year			
77.	Flight Diversions/Delay	Diversion/DeLay in flights operation due Power Supply failures for ANS	….nos/Year			
78.	Air-condition	Diversion/DeLay in flights operation due Air-conditioning failures for ANS				
Part 5 :- General Observations for Lift/Escallatores/travellators/Conveyors inside the Terminal Building						
79.	Terminal Building	No of Lifts and validity of their AMC/CMC contracts with their OEM/ their authorised service dealers.				

80.	Terminal Building	No of Escalators and validity of their AMC/CMC contracts with their OEM/ their authorised service dealers.				
81.	Terminal Building	No of Travellators and validity of their AMC/CMC contracts with their OEM/ their authorised service dealers.				
82.	Terminal Building	No of Departure Conveyors and validity of their AMC/CMC contracts with their OEM/ their authorised service dealers.				
83.	Terminal Building	No of Arrival Conveyors and validity of their AMC/CMC contracts with their OEM/ their authorised service dealers.				
84.	Terminal Building	Visibility and easy access of the passengers to the EMERGENCY STOP button of all the Travellators/Escalators/Conveyors				
85.	Terminal Building	Serviceability and availability of Siren/Hooter, Telephone, Emergency numbers list & Licence /Certificate display and List of Dos & DON'Ts inside all the lifts.				
86.	Terminal Building	Availability and Serviceability of nearest floor door opening provision in the lift, in case of Power Failure.				

Checklist - 6

SMS Audit Check List

(References are as per the DGCA CIVIL AVIATION REQUIREMENTS SECTION 1 – GENERAL SERIES 'C' PART I, Issue III, 24th March 2022 and C-SMS manual Version 4, Issue 1)

Sl. No.	Reference	Aspects	Observations	Comments
1.	C-SMS manual	Whether the safety manager's office is is established and maintained?		
2.	C-SMS manual	Whether the copy of C-SMS manual is available or not ?		
3.	C-SMS manual	Date of the last update of S-SMS manual		
4.	C-SMS manual	Whether S-SMS manual is endorsed by Executive Director Aviation Safety?		
5.	C-SMS manual	Whether scope of the SMS is defined in the S-SMS manual for ANS or aerodrome operations or both?		
6.	C-SMS manual	Whether Accountable executive /APD/CIC is SMS trained by Dte of AVS?		
7.	C-SMS manual	Whether all the HODs are SMS trained by Dte of AVS?		
8.	C-SMS manual	Whether Safety Manager nominated? If more than one safety managers are nominated than is the Lead Safety Manager is nominated?		
9.	C-SMS manual	Whether Safety Manager is SMS trained by AVS Dte.?		
10.	C-SMS manual	Is the Station-Safety committee formed and quarterly meetings are conducted regularly		

11.	DGCA CAR	Is the Runway Safety committee formed and Half yearly/quarterly(as applicable) meetings are conducted regularly?		
12.	AAI-SAF 107	Whether SMS Implementation plan is prepared?		
13.	DGCA CAR, Sec-1, Series 'C' Part-1 Appendix C	Whether the Phase 1 & 2 of SMS Implementation plan is completed? If not, which elements are pending & when these will be completed?		
14.	DGCA CAR, Sec-1, Series 'C' Part-1 Appendix C	Whether the Phase 3 of SMS Implementation plan is completed? If not, which elements are pending & when these will be completed?		
15.	DGCA CAR on SMS Appendix C	Whether the Phase 4 of SMS Implementation plan is completed? If not, which elements are pending & when these will be completed?		
16.	C-SMS manual para	Whether the SMS training are being conducted on regular basis for operational staff? Records are available or not.		
17.	DGCA CAR on SMS, Para 7.1	Whether Airport emergency plan & contingency Plan for aircraft accidents and incidents and other aviation emergencies are established and maintained?		
18.	DGCA CAR on SMS, Para 10.1	Whether the Safety performance Indicators (Lagging & Leading) for the station are identified?		
19.	DGCA CAR on SMS, Para 10.1	Whether the Safety performance Indicators (Lagging & Leading) data are collected and analysed?		

20.	C-SMS Manual	Whether the SPI & SPT booklet is prepared for previous year and the targets are defined for next year?		
21.	C-SMS manual	HAZLOG register are maintained in AAI-SAF-127 (AIMS/Soft copy/hard copy) (with Safety Manager)		
22.	C-SMS manual	Whether records of safety assessments documents are maintained?		
23.	C-SMS manual	Project Risk register (PRR) opened and maintained (with concerned project manager)		
24.	C-SMS manual	Operational Risk register (ORR) opened and maintained (in the concerned operational unit)		
25.	C-SMS manual	Weather Boxes are kept at prominent location for Voluntary Hazard reporting ?		
26.	C-SMS manual	Whether the record of Voluntary hazard is maintained and Whether the hazards reported through VRS are mitigated ?		
27.	C-SMS manual	Whether Safety Policy and Safety Objectives of AAI are displayed at prominent location?		
28.	C-SMS manual	List the safety promotional activities carried out in last one year.		

AUDIT NOTIFICATION Date:		
Airport Director Airports Authority of India ……. Airport/ANS Unit, …….	File No.**.....**	
Please note that it is the intention of Aviation Safety Directorate to conduct an audit in your area of responsibility as		
Audit location		
Audit Period		
Audit No.		
Audit Objective	Identification of operational & system deficiencies which may lead to an incident or accident, or present a hazard to safe operation of aircraft.	
Audit Scope	Safety audit shall examine units & facilities pertaining to: • ATM • CNS • Operations • Engineering • Rescue & Fire Fighting • Any other safety-related area	
Proposed Schedule of Meetings	Entry Meeting Exit Meeting	Date: …… Time: …… Date: …… Time: ……

Reference documents:	The following documents are required to be present before audit team during audit. The same may be kept ready: 1. Emergency & contingency, Anti-hijacking plan procedures & building evacuation and other safety related plans etc. 2. Station Safety Management Manual, Record of SMS activities including but not limited to HAZLOG, Associated Indicators, monitored values as per review frequency, Incidents reports etc. 3. Technical instructions/Operational Circulars, Manuals, maintenance records, concerning ATM, CNS, Ops/ Engg-Elect, ARFF viz. training, Rating, Proficiency check, Medical record etc. 4. ATM / CNS / Ops / Elect / ARFF facilities maintenance documents/records etc. 5. Any other document.	
Audit Activities	The expected time & duration of each major audit activity is as follows:	
	Activity Desktop Audit and Examination of units	**Duration** In Consultation with HODs
Reason for Audit		
Expected Date of Report to the Airport/ANS Unit		
Expected Date of ATR by the Airport/ANS Unit		

Attachments: Standard Audit Checklists of ATM/CNS/Ops/Engg/ARFF.

Team Leader
Name & Signature

प्रतिलिपि:

1. क्षेत्रीय कार्यकारी निदेशक, (उत्तरी/पूर्वी/पश्चिमी/दक्षिणी/उत्तरपूर्वी क्षेत्र), भारतीय विमानपत्तन प्राधिकरण, नई दिल्ली ।
2. संयुक्त महाप्रबंधक (वि.सं), (उत्तरी/पूर्वी/पश्चिमी/दक्षिणी/उत्तरपूर्वी क्षेत्र), भारतीय विमानपत्तन प्राधिकरण, नयी दिल्ली ।

Aviation Safety Directorate

AUDIT OPENING/CLOSING MEETING SUMMARY

Airport/ Location :

Team Leader

Opening Meeting:		**Date:**	**Open:**	**Close:**
Agenda		**Auditor Notes**		
1.	Introduce audit team			
2.	Confirm objectives and scope of audit			
3.	Review audit program			
4.	Summarize audit methods to be used			
5.	Identify personnel to be interviewed			
6.	Identify contacts or guides for each area			
7.	Explain the Requests for Corrective Action (RCA) process including auditee responsibility			
8.	Arrange meeting room/ facilities for audit team			
9.	Arrange daily briefings if req'd			
10.	Arrange time/place for exit meeting			
Closing Meeting:		**Date:**	**Open:**	**Close:**
Agenda		**Auditor Notes**		
1.	Discuss overview of audit findings			
2.	Provide written summary of findings			
3.	Issue or identify Requests for Corrective Action (RCA) - ensure acknowledgment			
4.	Explain post audit requirements – Requests for Corrective Action (RCA) and audit reports			
5.	Agree due date for action plan for major Requests for Corrective Action (RCA)			
6.	Provide copy of Audit Feedback Questionnaire			
7.	Close meeting			

Opening/Closing Meeting – Attendees					
	Name	**Designation**	**Employee**	**Telephone and Email**	**Signature**
1.					
2.					
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19.					
20.					
21.					

File No. Date:

To,

Airport Director/CIC/OIC
Airports Authority of India
---------- Airport.

Subject: Audit Report

Attached please find the Audit Report as per the details given below. The Action Taken Report on RCA may be submitted within 15 days of the receipt of this report.

Audit Location/Function			
Audit Number:		Audit Date(s)	
Audit Team Leader		Audit Team Members	
Date of this Report		File Reference	

REPORT CONTENTS

1. **Executive Summary**
   - **a.** Introduction

2. **Audit Report**
   - **a.** Audit Objectives and Scope
   - **b.** Audit Methodology
   - **c.** Audit Observations
   - **d.** Requests for Corrective Action

3. **Attachments (As required)**

Signature
Regional Safety Manager / GM (AVS)

Copy of the Report forwarded to:

1. Regional Executive Director, ------- Region
2. GM (AVS), AAI, CHQ / Regional Safety Manager, ------- Region.

REQUIRED CORRECTIVE ACTION ON AUDIT OBSERVATIONS (RCA)

PERIOD OF AUDIT		DATED	
Station:	Region:	Conducted by CHQ/RHQ	AREA OF AUDIT: ATM/CNS/Ops/Elect/ARFF

S. No.	**Required Corrective Action**	**Remarks**

Action taken report should be submitted within 15 days of receipt of the audit report.

(Signature of the Auditor)
Name & Designation

(Signature)
Name & Designation
Regional Safety Manager/GM (AVS), CHQ

AUDIT PROCESS FEEDBACK QUESTIONNAIRE

Audit No……. Station……..Period of audit……..Team Leader……..

1. Did you receive notification of the audit at least two weeks in advance?	YES / NO
Comment:_____	
2. Was an Entry Meeting held with you prior to the start of the audit?	Prior To / Concurrent
Comment:_____	
3. Were audit objectives, scope and times discussed with you during Entry Meeting?	YES / NO
Comment:_____	
4. Were your concerns about the audit solicited during the audit?	YES / NO
Comment:_____	
5. Were the auditors responsive to your concerns during the audit?	YES / NO
Comment:_____	
6. Were you kept informed of audit itinerary changes?	YES / NO
Comment: _____	
7. Were you periodically briefed or kept adequately informed on issues as they developed during the audit?	YES / NO
Comment:_____	
8. At the Exit Meeting, were all findings discussed with you in detail?	YES / NO
Comment:_____	
9. Were all issues of fact (not interpretation) resolved during the Exit Meeting?	YES / NO
Comment:_____	
10. Do you want to suggest any changes in the duration and frequency of Audit?	YES / NO
Comment:___	
11. How much did the audit assist your workplace? (Please circle one)	Low Value High Value 0 1 2 3 4 5 6 7
12. Are you familiar with the AAI National Audit Schedule	YES /NO

15. What specific changes can we make to best improve our audit process? / Other comments

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Name:(optional - Please Print)

_____

Directorate / Location

_____/_____/_____

Date:_____

NOTE: Please return to edas@aai.aero:

Executive Director
Directorate of Aviation Safety
Airports Authority of India
Rajiv Gandhi Bhavan, Block-A,
Safdarjung Airport,
New Delhi – 110 003.

Quarterly Report on Required Corrective Action (RCA) of Safety Audits

Period: From …….to …….. Date:

Region: NR/ER/NER/SR/WR Directorate: ATM/CNS/OPS/ARFF/ENGG-Elect

S No	Period of Audit	Required Corrective Action	Action Taken by APD/CIC/OIC	PDC if any	Remarks
Airport/ANS Center Name: ……					
1					
2					
3					
4					
-					
.					
.					
Airport/ANS Center Name:……					
1					
2					

(Signature)
Name:
Designation:

Separate report should be submitted for each directorate.
To be submitted by Regional Safety Manager to ED(AVS), CHQ **by 10th of Jan/April/July/Oct for previous quarter.**

Hazard Register - HAZLOG

1. Introduction

Hazard identification & Safety Risk assessment & Mitigation are one of essential elements in ICAO SMS framework.

HAZLOG is the backbone of an SMS. A well-maintained HAZLOG can act as a repository of hazards pertaining to one single project or as a master database pertaining to the airport. It is a real-time indication of the safety health of an airport as well as a safety library for future reference.

2. Organizational Requirements

2.1 A service provider shall develop and maintain a formal means for effectively collecting, recording, acting on and generating feedback about hazards in operations, which combine reactive, proactive & predictive methods of safety data collection. Formal means of safety data collection include mandatory, voluntary & confidential reporting.

2.2 All these hazards along with it's analysis should be compiled and documented in a standard format as HAZLOG register and should be maintained regularly.

3. Documentation

3.1 DGCA has developed a Hazard log template. (Refer DGCA SSP Division Circular No. 1 of 2012 revised on 29.09.2020).
Based on the DGCA circular, **AIMS for Aviation Safety Module has a HAZLOG Portal (AAI-SAF-127) .**

3.2 All AAI managed airports / ANS unit shall use the HAZLOG (AAI-SAF-127) for compiling all active hazards present in the system. The template shall be maintained regularly by logging all active hazards of the airport along with its analysis.
Each hazard along with its consequences, initial risk assessment (with existing risk control), Residual risk (with potential risk control) as carried out in HAZID form (AAI-SAF-105) shall be summarized & documented in an objective manner in a HAZLOG along with action officer for implementation of potential risk control, current status & review date.

3.3 The safety manager is responsible for establishment and management of HAZLOG / Hazard register.

3.4 Continuous compilation and formal management of hazard related knowledge become "Safety library" of an organization.

3.5 Centralized HAZLOG / Hazard register shall be reviewed at least once in a year by Aerodromes / Civil Enclaves and ANS centers.

AIRPORTS AUTHORITY OF INDIA

AAI - SAF-127

(Reference-SSP Division Circular No. 1/2012 Revised on 29.09.2020)

ID	Originator	Source	Location (ICAO Designator)	Date added to Hazlog	Functional Area	Hazard description	Resultant risk of hazard	Worst credible effect and reason	Existing controls (defences)	Outcome Pre-mitigation			Additional risk controls (risk mitigation strategy)	Outcome post-mitigation			Action	Owner	Deadline	Status and completion date	Review period
HAZ/VEGT/ATM/000001	AAI	HazID Workshop	VEGT	08.01.2022	ANS - TWR service	Loss of communication	Diversion, Incident, Accident etc	Accident	Procedural mitigations promulgated internally to TWR ATCOs (exact ref to be given)	B	4	Intolerable	Procedural mitigation to flight crews and vehicle drivers (exact refs to be given)	B	3	Tolerable	Liaise with base airlines and vehicles owners to develop and communicate procedures in case of loss of cmns	Mr A.N. Other, Safety Manager, TWR services	01-Jul-20	Open	One Month
2																					
3																					
4																					
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Safety Performance Indicators/Safety Performance Targets (SPIs/SPTs)

1. Introduction

Safety Performance Indicator (SPI) package of Airports Authority of India (AAI) every year (1st January to 31st December) is drawn from two mainstream operational sectors of AAI. These safety critical sectors are Aerodrome Operations and Air Navigation Services (ATM & CNS).

These SPI are identified by :-

A) Safety Performance Indicators (High level / Lagging) identified by the DGCA
B) Low Consequences (Leading) Safety performance indicators identified by AAI for ANS and Airport operations

Safety Performance Targets (SPTs) of corresponding Safety Performance Indicator (SPIs), of which historical data is available, have been set every year.

Safety Performance Targets (SPTs) are based on percentage of improvement over last year safety performance (average), as agreed upon by respective directorates.

If the Safety Performance Target of any SPI is achieved in the previous year, the next years SPT is normally reduced by 3%. If the target is not achieved in the previous year, the next year SPT will be same.

Three Alert levels are also established based on the preceding period's performance, namely average and standard deviation (SD). Three Alert lines are average + 1SD / 2SD / beyond +2SD. An alert trigger (abnormal/ unacceptable trend) is indicated if any of the conditions below are met for current monitoring period:

- Any single point is above the Alert level 3 line
- 2 consecutive points are above the Alert Level 2 line
- 3 consecutive points are above the Alert level 1 line

Standard Deviation (SD)

$SD = \sqrt{\Sigma(x-u)^2/12}$

Where x is incident rate and u is average of incident rate

Formula	Explanation
$\sigma = \sqrt{\frac{\Sigma (X-\mu)^2}{N}}$	• σ = population standard deviation • ∑ = sum of… • *X* = each value • μ = population mean • *N* = number of values in the population

2. Source of Data

Traffic data is derived from Airport Information Management System (AIMS). This includes total number of Arrivals, departures and over flights. An over flight means an aircraft entering Indian airspace, over flying Indian airspace and exiting Indian airspace.

Incidents data is derived from the AIMS portal data entered by the ANSP and Aerodrome operations in respective module.

3. Annual Safety performance summary

Annual safety performance summary is compiled in CHQ at the end of each monitoring period i.e. by 31st December of every year for Pan India. Annual safety performance summary shall

be compiled at each Airport/ ANS station for their stations. Summary will be based on respective Target & Alert level outcomes annotated.

At the end of current year, if the average rate for the current year is at least equal to or lower than the set Target, then the set Target of improvement is deemed to have been achieved.

Annexure 1

AAI Safety Performance Summary –current Year……				
Safety Performance indicators (SPIs)				
SPI Description	**SPI Alert Level Criteria (for next year))**	**Alert Level breached [Yes/ No] for previous year**	**SPI Target Level Criteria (for next year)**	**Target Achieved [Yes/No] (in current year)**
1. SPI description	Avg.+1SD= ….. Avg.+2SD= **……** Avg.+3SD= **……**			

Annexure 2

SPIs description (Name of SPI) **Year (1st Jan to 31st Dec)**

Definition of SPI

Source of Data

Month	Total Aircraft Movements (Dep + Arr)	SPI (e.g. Number of Bird Strikes per 10,000 movement)	Incident Rate (Per 10,000) (x)	Average µ	µ + 1 SD	µ +2 SD	µ +3 SD	Target
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								

Note: Graphical representation may be plotted for the SPI/SPT

3.1.1. Safety Performance Target (SPT):

3.1.2. Alert Level:

a) **Alert level setting: -**

Alert level for year…… is set as below,

- Alert level 1 - Avg.+1SD =
- Alert level 2 - Avg.+2SD =
- Alert level 3 - Avg.+3SD =

b) **Alert Level Trigger: -**

An alert (abnormal/ unacceptable trend) is indicated if any of the conditions below are met for current monitoring period year……

- Any single point is above the Alert level 3 line
- 2 consecutive points are above the Alert Level 2 line
- 3 consecutive points are above the Alert Level 1 line

When Alert is triggered (potential high risk or out of control situation), appropriate follow-up action is expected, such as further analysis to determine the source and root cause of the abnormal incident rate and any necessary action to address the unacceptable trend.

3.1.3. Target Achievement at the end of monitoring period (Next year)

At the end of the current year, if the average rate for the current year is equal to or less than the target set for the year, then the set target is deemed to have been achieved.

3.1.4. Safety Action Plan

References	Safety Measures Already in Place

Safety objective(s)	Proposed Action

Reference: Aviation Safety Circular No. 01/2008 dated 29th April, 2008 issued by Chairman, AAI.

The text of the above referred circular is quoted below:

Subject: **Mandatory wearing of High Visibility Jackets by Personnel entering and working in operational area.**

"In the recent past, a large number of incidents have been reported about injuries to the persons working in Operational/Apron area. Some of these incidents have resulted in damage to the aircraft and unfortunately, have been fatal resulting into the death of some employees.

In order to minimize the risk to the persons working in operational area and to enhance safety on the apron, it has been decided that all persons including contractor's casual labourers entering into Operational/Apron area, shall wear **HIGH VISIBILITY JACKETS** during their working at the airport".

Reference: Aviation Safety Circular No. 02/2001 dated 10th July, 2001.

The text of the above referred circular is quoted below:

Subject: INSULATING MATS

"In order to ensure safety while working on electrical installations, insulating mats are to be provided in front and back side of electrical installations as per current IS specifications. These specifications are given in IS 5424 and a copy of the same is enclosed as Annexure -A.

In the recent past, during safety audit of Airports, it has been observed that insulating mats are either not provided or if provided are not maintained properly with the result it develops cracks, pinholes etc.

While deciding the quality of insulating mats, great care should be exercised, if these mats are not made of vulcanized rubber compound free from fabric insertions and fibrous materials it absorbs moisture which hastens its early withering. The insulting mats should afford the desired level of protection for those working on electrical installations against the risk of electrical shock etc.

The specification given in IS 5424 is applicable for voltages upto 3300 volts. While deciding the requirement of insulating mats for installations having voltage more than 3300 volts, insulating mats with higher specification if available may be considered.

Annexure – A

1. SCOPE

1.1 The standard prescribes the requirement, method of sampling and test for solid rubber insulating mats for use as floor covering around electrical apparatus not exceeding 3300 volts to ground.

1.1.1 This standard does not cover perforated matting.

2. REQUIREMENTS

2.1 Materials and Manufacture – The mats shall be made from vulcanized rubber compound free from fabric insertions and fibrous materials.

2.1.1 The upper surface may have a ribbed, fluted, or other suitable pattern or may be plain. The lower surface may be finished in cloth imprints. The outside edges, except the butt edges, where a mat consists of two or more sections, may be beveled.

2.2 Dimensions

2.2.1 **Thickness** – Unless otherwise specified, the thickness of the plain mats shall be not less than 6.5 mm. Patterned mats shall not be less than 6.5 mm thick at the root of the pattern.

2.2.2 **Length and Width** – The length and width of the mats shall be as agreed to between the purchaser and the supplier.

2.3 **Colour** – The colour of the mats shall be black unless otherwise specified.

2.4 **Workmanship and Finish** – The material shall be free from blisters, pinholes, cracks, embedded foreign matters and other defects which may impair its serviceability, when visually examined.

2.5 Physical properties

2.5.1 **Tensile Strength and Elongation at Break** - The tensile strength and the elongation at break of the rubber shall be as follows :

Tensile strength, kgf/cm^{2}Min	50
Elongation at break, percent, Min	250

2.5.2 **Compression Set** – Compression set of the rubber shall not exceed 10 percent.

2.5.3 **Ageing Properties** – The tensile strength and elongation at break of the test samples, when subjected to ageing for 7 days at 70° +/- 1°C shall not exceed the following limits of the corresponding values (see 2.5.1) obtained before ageing:

Characteristics	Percent change from the Original value
Tensile strength	{ - 10 { - 25
Elongation at break	{ - 10 { - 25

2.6 Electrical Properties

2.6.1 **Voltage test** – The mats shall withstand 15000 volts for 1 minute when tested according to the method prescribed in IS:2584-1963. The mats shall not puncture, become appreciably warm at any spot or show any other evidence of weakness. The leakage shall not exceed 160mA/m^2 (calculated on the area of the smaller electrode) for any position of the electrodes.

2.6.2 **Breakdown Strength** – The mats shall not fail at less than 40000 volts when tested in air between electrodes, the voltage being applied to failure at the rate specified and tested according to IS:2584-1963.

2.7 **Water absorption** – The mat shall not absorb water more than 4 mg / cm^2

3. MARKING AND PACKING

3.1 Marking – Unless otherwise specified, the mats shall be marked with the following information:

a) Size and surface of matting (that is, plain or patterned);
b) Rates potential followed by the word 'Working' in brackets;
c) Manufacturer's name or trade-mark, if any; and
d) Month and year of manufacture.

3.1.1 The mats may also be marked with the Standard Mark.

3.1.2 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

3.2 **Packing** – The mats shall be packed as agreed to between the purchaser and the supplier."

Reference: Aviation Safety Advisory Circular No. 3 / 2023 dated 15th September, 2023

The text of the above referred circular is quoted below:

Sub: Use of personnel mobile phone in the ATS and CNS units (HF R/T)

"The use of personal mobile phones or electronic devices capable of communication, social Media, Video watching etc. by ATCOs and HF Operators while on operational duty may distract themselves and other executives in the unit affecting the quality & efficiency of Air Traffic Services and may also compromise with the safety of Aircraft operations.

In this connection, the instructions are already issued vide MATS-1 para 3.11.1 and 3.11.2.

Quote "3.11.1 - Use of personal mobile phones in ATC operational areas is not permitted. The air traffic controllers shall keep their personal mobile phones on 'switched-off/ silent' mode when entering ATC operational areas. This shall apply to all Visitors including CNS/ ATSEP/ Engineering/ Maintenance/ Housekeeping Personnel.

3.11.2 - All ATC units shall have a notice displaying "USE OF PERSONAL MOBILE PHONES NOT PERMITTED. PLEASE KEEP IN SWITCHEDOFF/ SILENT MODE." unquote.

However, despite these instructions in vogue, during the Aviation Safety Audit of various ANS centers and the CNS facilities, it is observed that there are occasions when ATCOs and HF Operators on watch at active ATS positions, Alpha/ Coordinator positions, HF or HF Coordinator positions are found to be using the mobile phones. This has been viewed seriously by the management as it is not only a violation of instructions issued but is also a safety hazard.

It is, therefore, instructed that henceforth, ATCOs and HF Operators shall not keep their personal mobile phones and/or any electronic device capable of communication, social Media, Video watching etc. with them while on watch at active ATS positions, Alpha/Coordinator positions, HF or HF Coordinator positions as applicable and shall keep it either in the individual's bag/locker or deposit it to the WSO/ SSO.

The ATS and CNS – In charges shall ensure strict compliance of the above and existing instructions of MATS-1 on the subject."

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भारतीय विमानपत्तन प्राधिकरण

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