Nesma Airlines
نسما للطيران

Part (A) – VOL. (4)

Safety Management Manual

(S.M.M.)

S.M.M	
Issue No.: 01	**Revision No.: 13**
Issue Date: May 2010	**Revision Date: Jan. 2024**

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"CONTROLED DOCUMENT"
"COPY NO. …14…."

Attachment (C)

Operations Manual Approval /Acceptance Form

Part I: to be completed by the Operator	
- Operator Name: - *Nesma Airlines* - Manual Title: - **Part (A) – Vol. 4 – Safety Management Manual (S.M.M)** **Issue No.: 01** **Revision No.: 13** **Date: Jan. 2024**	
- Prepared by:	Name: **Samar Diab** Title: **Safety Specialist** Signature: Samar Diab Date: **Jan 2024**
- Revised by:	Name: **Eng. Bahy Metkies** Title: **Safety & Quality Director** Signature: Date: Jan 2024
- Accountable Manager:	Name: **Karim Baky** Title: **Accountable executive** Signature: FOR Date: **Jan 2024** **(Stamp)**

Part II : To be competed by ECAA

ECAA: Acceptance ☐ Approval ☐

Ops Inspector:

Name Mohamed Sadek Signature M Sadek Date: 12.2.2024.

Certification G.D:

Name Sherif Sadek Signature Date: 12 - 2 - 2024

FOCA Administrator:

Name Ashraf Abshady Signature Date: 13/2/2024

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Nesma Airlines	Safety & Quality Departmet
Safety Management Manual	

Chapter (0)

General

Part (0) – Table of Content		
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1	Chapter 0.1	Record of Approval
2	Chapter 0.2	Record of Amendment
3	Chapter 0.3	List of Effective Pages
4	Chapter 0.4	Table of Content
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6	Chapter 0.6	Manual User Guide
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8	Chapter 0.8	Definitions

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01 Record of Approval

This Safety Management Manual defines Nesma Airlines Company Safety Policy upon which it is approved by the Egyptian Civil Aviation Authority as an Air Operator under ECAR 19, 121& 145. This manual is declared by the undersigned and shall be complied with at all times and taking into consideration the terms of the Egyptian Civil Aviation Authority safety requirements.
It is understood that this manual does not override the necessity of complying with any existing, new or amended regulations published by the Egyptian Civil Aviation Authority.

	Name	Signature	Position	Date
Prepared by	Ms. Samar Diab	Samar	Safety Specialist	Jan. 2024
Reviewed by	Eng. Bahy Metkies		Safety & Quality Director	Jan. 2024
Approved By	Mr. Karim Baky	FOR	Accountable Executive	Jan. 2024

Nesma Airlines
نسما للطيران
Quality Department

0.1.1 Revision Highlights

This revision is No. "13" dated Jan. 2024 from the first edition No. 1 dated May 2010.
This revision was issued to be in compliance & renewed according to:

- Latest updated Policies
- job description
- Latest update of Drug Test
- Updating Flight Risk Assessment Form No. 351A
- Record of Approval Amendment

Safety & Quality Director

Eng. Bahy Metkies

Nesma Airlines
نسما للطيران
Quality Department

02 Record of Revision

Issue No.	Revision No.	Revision Date	Effective Date	Inserted by
1	Org	May 2010	May 2010	**Safety & Quality Department**
1	1	Dec. 2011	Dec. 2011	**Safety & Quality Department**
1	2	Feb. 2013	Feb. 2013	**Safety & Quality Department**
1	3	Feb. 2014	Feb. 2014	**Safety & Quality Department**
1	4	Oct. 2014	Oct. 2014	**Safety & Quality Department**
1	5	Jan. 2016	Jan. 2016	**Safety & Quality Department**
1	6	Dec. 2016	Dec. 2016	**Safety & Quality Department**
1	7	May 2017	May 2017	**Safety & Quality Department**
1	8	Feb. 2018	Feb. 2018	**Safety & Quality Department**
1	9	Jun. 2018	Jun. 2018	**Safety & Quality Department**
1	10	Oct. 2019	Nov. 2019	**Safety & Quality Department**
1	11	Mar. 2022	Mar. 2022	**Safety & Quality Department**
1	12	Jun. 2022	Aug. 2022	**Safety & Quality Department**
1	13	Jan. 2024	Jan. 2024	**Safety & Quality Department**

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03 List of Effective Pages

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0.2	1	Jan. 2024	Rev. 13	1.1	2	May 2010	Rev. Org
0.2	2	Dec. 2011	Rev. 01	1.2	1	Oct. 2014	Rev. 04
0.3	1	Jan. 2024	Rev. 13	1.2	2	Jan. 2024	Rev. 13
0.3	2	Jan. 2024	Rev. 13	1.2	3	Jan. 2024	Rev. 13
0.3	3	Jun. 2022	Rev. 12	1.2	4	Jan. 2024	Rev. 13
0.3	4	Jan. 2024	Rev. 13	1.2	5	Mar. 2022	Rev. 11
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0.8	3	Mar. 2022	Rev. 11	1.3	14	Jan. 2016	Rev. 05
0.8	4	Mar. 2022	Rev. 11	1.4	1	Oct. 2019	Rev. 10
0.8	5	Mar. 2022	Rev. 11	1.4	2	Oct. 2019	Rev. 10
0.8	6	Mar. 2022	Rev. 11	1.5	1	Dec.2011	Rev. 01
0.8	7	Mar. 2022	Rev. 11	1.5	2	Dec.2011	Rev. 01

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Part 1 (continued)				Part 2 (continued)			
1.5	3	Dec.2011	Rev.01	2.2	1	Jan. 2016	Rev. 05
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1.5	5	Dec.2011	Rev. 01	2.2	3	Jun. 2018	Rev. 09
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2.1	9	Dec.2011	Rev. 01	2.3	4	Jan. 2016	Rev. 05
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2.3	12	Jan. 2016	Rev. 05	4.1	4	Mar. 2022	Rev. 11
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2.4	1	Mar. 2022	Rev. 11	4.2	1	Jan. 2016	Rev. 05
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3.2	3	Jan. 2016	Rev. 05	5.1	2	Oct. 2019	Rev. 10
3.2	4	May 2010	Rev. Org	5.2	1	May 2010	Rev. Org
3.2	5	May 2017	Rev. 07	5.2	2	May 2010	Rev. Org
3.2	6	Jun. 2018	Rev. 09	5.2	3	May 2010	Rev. Org
3.2	7	Jun. 2018	Rev. 09	5.2	4	May 2010	Rev. Org
3.2	8	Jun. 2018	Rev. 09	5.2	5	May 2010	Rev. Org
3.3	1	Jan. 2016	Rev. 05	5.2	6	May 2010	Rev. Org
3.3	2	May 2010	Rev. Org	5.3	1	May 2010	Rev. Org
3.3	3	Feb. 2014	Rev. 03	5.3	2	May 2010	Rev. Org
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3.4	1	May 2010	Rev. Org	5.3	4	May 2010	Rev. Org
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3.4	3	May 2010	Rev. Org	5.3	6	May 2010	Rev. Org
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5.4	8	May 2010	Rev. Org	6.1	5	May 2010	Rev. Org
5.5	1	Jun. 2022	Rev. 12	6.1	6	May 2010	Rev. Org
5.5	2	Jun. 2022	Rev. 12	6.1	7	May 2010	Rev. Org
5.5	3	Jun. 2022	Rev. 12	6.1	8	May 2010	Rev. Org
5.5	4	Jun. 2022	Rev. 12	6.1	9	May 2010	Rev. Org
5.5	5	Jun. 2022	Rev. 12	6.1	10	Dec. 2011	Rev. 01
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5.5	7	Jun. 2022	Rev. 12	6.1	12	Oct. 2014	Rev. 04
5.5	8	Jun. 2022	Rev. 12	6.2	1	May 2010	Rev. Org
5.5	9	Jun. 2022	Rev. 12	6.2	2	May 2010	Rev. Org
5.5	10	Jun. 2022	Rev. 12	6.3	1	Oct. 2019	Rev. 10
5.5	11	Jun. 2022	Rev. 12	6.3	2	Oct. 2019	Rev. 10
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5.5	13	Jun. 2022	Rev. 12	6.3	4	Oct. 2019	Rev. 10
5.5	14	Jun. 2022	Rev. 12	6.3	5	Oct. 2019	Rev. 10
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5.5	17	Jun. 2022	Rev. 12	6.3	8	Oct. 2019	Rev. 10
5.5	18	Jun. 2022	Rev. 12	6.3	9	Oct. 2019	Rev. 10
5.5	19	Jun. 2022	Rev. 12	6.3	10	Oct. 2019	Rev. 10
5.5	20	Jun. 2022	Rev. 12	6.3	11	Oct. 2019	Rev. 10
5.5	21	Jun. 2022	Rev. 12	6.3	12	Oct. 2019	Rev. 10
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6.3	21	Oct. 2019	Rev. 10	6.4	1	Jan. 2016	Rev. 05
6.3	22	Oct. 2019	Rev. 10	6.4	2	Jan. 2016	Rev. 05
6.3	23	Oct. 2019	Rev. 10	6.4	3	Jan. 2016	Rev. 05
6.3	24	Oct. 2019	Rev. 10	6.4	4	Jan. 2016	Rev. 05
6.3	25	Oct. 2019	Rev. 10	6.4	5	Jan. 2016	Rev. 05
6.3	26	Oct. 2019	Rev. 10	6.4	6	Jan. 2016	Rev. 05
6.3	27	Oct. 2019	Rev. 10	6.4	7	Jan. 2016	Rev. 05
6.3	28	Oct. 2019	Rev. 10	6.4	8	Jan. 2016	Rev. 05
6.3	29	Oct. 2019	Rev. 10	6.4	9	Jan. 2016	Rev. 05
6.3	30	Oct. 2019	Rev. 10	6.4	10	Jan. 2016	Rev. 05
6.3	31	Oct. 2019	Rev. 10	6.4	11	Jan. 2016	Rev. 05
6.3	32	Oct. 2019	Rev. 10	6.4	12	Jan. 2016	Rev. 05
6.3	33	Oct. 2019	Rev. 10	6.4	13	Jan. 2016	Rev. 05
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6.3	35	Oct. 2019	Rev. 10	6.4	15	Jan. 2016	Rev. 05
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6.5	5	Jan. 2024	Rev. 13
6.5	6	Jan. 2024	Rev. 13
6.5	7	Jan. 2024	Rev. 13
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6.5	10	Jan. 2024	Rev. 13
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6.5	12	Jan. 2024	Rev. 13
6.5	13	Jan. 2024	Rev. 13
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6.5	17	Jan. 2024	Rev. 13
6.5	18	Jan. 2024	Rev. 13
6.5	19	Jan. 2024	Rev. 13
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0.4 Table of Contents (TOC)

05 Distribution List

No.	Title	Type	Quantity	Control No.
1	Egyptian Civil Aviation Authority	H.C.	1	01
2	Nesma Airlines accountable executive	C.D./S.C	1	02
3	Nesma Airlines Operations library	C.D./S.C	1	03
4	Nesma Airlines Technical Library	C.D./S.C	1	04
5	Nesma Airlines Safety & Quality Director	H.C.	1	05
6	Nesma Airlines Chief Pilot	C.D./S.C	1	06
7	Nesma Airlines Flight Safety Manager	C.D./S.C	1	07
8	Nesma Airlines Training Manager	C.D./S.C	1	08
9	Nesma Airlines Chief inspector	C.D./S.C	1	09
10	Nesma Airlines Maintenance Manager	C.D./S.C	1	10
11	Nesma Airlines IFS Manager	C.D./S.C	1	11
12	Nesma Airlines Stations Manager	C.D./S.C	1	12
13	Nesma Airlines Security Manager	C.D./S.C	1	13
14	Nesma Airlines IT department (electronic library)	C.D./S.C	1	14
15	Nesma Airlines OCC Manager	C.D./S.C	1	15

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06 Manual User Guide

0.6.1 Overview:

i. Nesma Airlines Safety Management Manual (SMM) is a safety management tool of the Accountable Executive of Nesma Airlines.

ii. This manual is designed to ensure that safety is managed in accordance with requirements. regulations and standards of various authorities including the Egyptian Civil Aviation authorities, relevant foreign aviation authorities, IOSA standards, and applicable international regulatory bodies, in addition, the manual aims to ensure full compliance with our own internal requirements for high standards of safely and quality at Nesma Airlines.

iii. SMM covers all aspects of Nesma Airlines management of safety and quality in operations, including but not limited to activities of the Flight Operations, Aerodrome operations, Aircraft Maintenance, Ground Services, Cargo and In-flight Services in all subcontractors

0.6.2 Editing and Manual Revision:

To ensure that (SMM) is maintained and updated in a systematic manner, responsibility for the manual and its contents is delegated as follows.

0.6.2.1 The (SMM) Editor is the safely and Quality Director and he shall ensure that:

i. All content is in compliance with relevant regulations and requirements of authorities,

ii. The Manual is continuously updated and maintained,

iii. The Manual will be revised whenever there are any changes in the company organization, policy or regulatory requirements.

0.6.3 Printing and distribution:

It is the responsibility of the safety and Quality Director to arrange / control distribution of the manual distribution list (Ref. to Ch.: 0.6)

0.6.4 Amending and updating the manual:

i. It is the responsibility of the Safely & Quality Director

ii. For clarity, Revisions, addition and deletions shall be identified by a straight vertical line along the left hand margin of the page next to the portion of text that was amended or updated, if the whole page changed the vertical line will be in the footer.

0.6.5 Manual and revision issuance:

It is requested from the manual holder to send back to Safety & Quality director a confirmation of receiving the revision and updating the manual.

- Issuance of the original manual and any subsequent revisions shall include:
- A list of effective pages (LOEP)
- The revised pages.
- The manual holder shall make entries into the manual to ensure that the manual was properly updated after every set of revision by:
- Rechecking that all pages indicated in the new (LOEP) have been received.
- Inserting new pages into the manual according to the (LOEP).
- Removing and destroying the corresponding out-dated pages from the manual.
- Replacing the former (LOEP) with the current (LOEP).
- An archive copy of the superseded pages will be kept in the safety and quality Department for three years as a history record.

Any requirements for change in the contents of this manual should be notified to Nesma Airlines Safety and Quality Director.

07 Abbreviation

A/C	Aircraft
ACARS	Aircraft Communications Addressing and Reporting System
ACI	Airports Council International
ADREP	Accident/Incident Data Reporting (ICAO)
ADRM	Aerodrome
AEP	Aerodrome Emergency Plan
AE	Accountable Executive
AIA	Accident Investigation Authority
AIRS	Aircrew Incident Reporting System
ALOSP	Acceptable Level of Safety Performance
AMAN	Abrupt Maneuver
AME	Aircraft Maintenance Engineer
AMJ	Advisory Material Joint
AMO	Approved Maintenance Organization
AMPP	Alcohol misuse prevention program
AOC	Air Operator Certificate
ARC	Abnormal Runway Contact
ASR	Air Safety Report
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATM	Air Traffic Management
ATS	Air Traffic Service(s)
CAA	Civil Aviation Authority
CABIN	Cabin Safety Events
CFIT	Controlled Flight into or Toward Terrain
CIR	Circular
CMC	Crisis Management Centre
CRM	Crew Resource Management
CTOL	Collision with obstacle (s) during take-off and landing
CVR	Cockpit Voice Recorder
Doc	Document
DGR	Dangerous goods regulation
ECAA	Egyptian Civil Aviation Authority
ECAR	Egyptian Civil Aviation Regulations
EGPWS	Enhanced Ground Proximity Warning System
ERP	Emergency Response Plan
EU	European Union
EVAC	Evacuation

EXTL	External load related occurrences
FCO	Flight Crew Order
FDA	Flight Data Analysis
FDM	Flight Data Monitoring
FDR	Flight Data Recorder
FMS	Financial Management System
F-N	Fire/smoke (non-impact)
F-POST	Fire/smoke (post-impact)
FOD	Foreign Object Damage
FDR	Flight data recorder
FH	Flying hours
FIR	Flight information region
FL	Flight level
FRMS	Fatigue risk management systems
Ft.	Feet
FTL	Flight time limitation
Fuel	Fuel related
GASP	Global Aviation Safety Plan
GCOL	Ground Collision
GPWS	Ground Proximity Warning System
GTOW	Glider towing related events
H	Hazard
HF	Human factors
HIRA	Hazard identification and risk assessment
HIRM	Hazard identification and risk mitigation
IATA	International Air Transport Association
IAW	In accordance with
ICAO	International Civil Aviation Organization
ICE	Icing
IOSA	IATA Operational Safety Audit
ISO	International Organization for Standardization
ISTARS	Integrated Safety Trend Analysis and Reporting System
Kg	Kilogram(s)
LALT	Low altitude operations
LDG	Landing
LOC-G	Loss of control - ground
LOC-I	Loss of control - inflight
LOLI	Loss of lifting conditions En-route
LOSA	Line Operations Safety Audit

M	Meter(s)
MEL	Minimum equipment list
MOR	Mandatory occurrence report
N/A	Not applicable
OEM	Original equipment manufacturer
OPS	Operations
ORP	Organization risk profile
OSC	Organization safety culture
OSHE	Occupational safety, health and environment
OJT	On-the-job Training
OSH	Occupational Safety and Health
PC	Preventive Control
PIRG	Planning and Implementation Regional Group
QA	Quality assurance
QC	Quality control
QM	Quality management
QMS	Quality management system
RAMP	Ground Handing
RASG	Regional Aviation Safety Group
RE	Runway excursion
RI-A	Runway incursion anima
RI-VAP	Runway incursion vehicle, aircraft or person
RNP	Required Navigation Performance
RSOO	Regional safety oversight organization
SAG	Safety Action Group
SARPs	Standards and Recommended Practices (ICAO)
SB	Service bulletin
SCF-NP	System/component failure or malfunction (non-power plant)
SCF-PP	Power plant failure or malfunction
SD	Standard deviation
SDCPS	Safety Data Collection and Processing Systems
SDR	Safety Data Request
SEC	Security related
SeMS	Security management system
SHEL	Software/Hardware/Environment/Liveware
SM	Safety Manager
SMM	Safety Management Manual
SMP	Safety Management Panel
SMS	Safety Management System(s)

SOPs	Standard Operating Procedures
SPI	Safety performance indicator
SPT	Safety performance Target
SRBS	Safety Risk – Based Surveillance
SRC	Safety Review Committee
SRM	Safety Risk Management
SSO	State Safety Oversight
SSP	State Safety Program
S & Q	Safety & Quality
STDEVP	Population Standard Deviation
TCAS	Traffic Alert and Collision Avoidance System
TOR	Tolerability of Risk
TBD	To be determined
TNA	Training Needs Analysis
TOR	Terms of reference
TURB	Turbulence encounter
UE	Unsafe event
UIMC	Unintended flight in IMC - Unintended flight in Instrument Meteorological Conditions (IMC)
U. K	United Kingdom
UNK	Unknown
U. S	United States
USOAP	Universal Safety Oversight Audit Program
USOS	Undershoot/overshoot
WIP	Work in progress
WSTRW	Wind shear or thunderstorm

08 Definitions

- **Acceptable level of safety performance (ALOSP):**
  The level of safety performance agreed by State authorities to be achieved for the civil aviation system in a State, as defined in its State safety program, expressed in terms of safety performance targets and safety performance indicators.
- **Accountable Executive:**
  Is the one who has corporate authority for ensuring that all work required by the customer can be Unaided and carried out to the standard required?
- **Accident**
  An occurrence associated with the operation of an aircraft which takes place between the times any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:
  i. a person is fatally or seriously injured as a result of: being in the aircraft, or having direct contact with any part of the aircraft, including part which have become detached from the aircraft, or direct exposure to jet blast.
  ii. The aircraft sustains damage of structure, 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.
  iii. The aircraft is missing or is completely inaccessible.
- **Accident Prevention**
  The detection and the elimination or avoidance of hazards to prevent accidents, thus improving public confidence in Air safety, saving lives, property and money and reducing suffering.
- **Accident Prevention Committee**
  A committee headed by Nesma Airlines Chairmen and comprised of all division directors and experts assigned by Nesma Airlines chairman, they are responsible for investigating occurrences / incidents / accidents and issue recommendations to avoid future occurrence.
- **Active failures:**
  Are generally the results of equipment faults or errors committed by personnel?
- **Acts of Unlawful Interference**
  Any criminal act which jeopardizes the safety, regularity, or efficiency of international civil aviation.
- **Aeroplane:**
  A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.
- **Agreement**
  A written statement accepting certain conditions.

- **Aircraft**
  Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface
- **Air Operator Certificate (AOC)**
  A certificate issued by the state of the operator authorizing the operator to carry out specified commercial air transport operations involving the transport of passengers, cargo, mail and / or baggage for remuneration or hire (ref. ICAO Annex 6, Part I).
- **Air Traffic Control (ATC)**
  The local airport facility of Air traffic services which controls aircraft movement within a designated geographical area of the state.
- **Aircraft – Ground Incident**
  An occurrence associated with the operation of an aircraft involved in an emergency situation in which the aircraft or a person has been exposed to undue risk resulting in an emergency evacuation of passenger / crew by emergency slides, injuries to persons involved, and / or damage to the aircraft. Aircraft accidents in which there are no serious injuries or deaths may also be classified as an aircraft – ground incident if there is major damage to the aircraft.
- **Airworthiness Certificate**
  A mandatory certificate issued and validated by the state of registry to verify compliance with minimum ICAO standards to authorize eligibility of the aircraft for international operations (ref. ICAO Annex 8).
- **Anonymization:**
  The removal from occurrence reports of all personal details relating to the reporter and to the persons mentioned in occurrence reports and any details, including the name of the organization(s) involved in the occurrence, which may reveal the identity of the reporter or of a third party or lead to that information being inferred from the occurrence report.
- **Audit**
  Systematic and independent examination to determine whether safety and quality activities and related results meet requirements based on documentation, procedures and work instructions and whether procedures are implemented effectively and are suitable to achieve desired objectives.
- **Certificate**
  A written statement of qualifications or accomplishments.
- **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.

- **Civil Aviation Authority (CAA)**
  A government – appointed agency which regulates oversees, and ensures the safety of air transport within the territory of the state.
- **Competency**
  Processing adequate and suitable qualifications and skills to perform a particular task, duty, or profession.
- **Continuation Training**
  Training which supports and builds on a foundation of previous training and existing skills.
- **Convention on Internal Civil Aviation**
  The constitution of ICAO established at the Chicago convention of 1944 by signatory states to establish regulations and obligations of states to ensure safe international air transport (ref. ICAO Doc 7300)
- **Company Safety and Quality Review Board**
  An upper level management body comprised of chairman of Nesma Airlines as president, Director of Operation Division, Director of Technical Division, Manager of ground services and Nesma Airlines safety and quality Director which is responsible for the routine review of the safety and quality performance of operations for improvement in policy, system and procedures and optimal utilization of resources for safety assurance.
- **Corporate Safety Culture:**
  Is the atmosphere created by management that shapes workers attitude towards safety?
- **Corrective action**
  Remedial action intend to correct/improve/overcome any defect or nonconformity in documentation, procedures or implementation.
- **Customer**
  One who buys or purchases products, goods or services from another.
- **Department head**
  The administrative head with responsibility and authority over a major area of Nesma Airlines business activities.
- **Emergency**
  A state of sudden, pressing necessity requiring immediate response**.**
- **Emergency evacuation**
  The urgent and rapid disembarkation of occupants from the aircraft due to imminent danger to the aircraft and its occupants.
- **Errors:**
  Actions or inactions by persons that have an adverse effect.
- **Federal aviation administration (FAA)**
  The CAA of the United States empowered to monitor, control and enforce aviation safety to / from / through the territory of the U.S.A.

- **Federal Aviation Requirements (FAR)**
  Special national requirements of the U.S.A. which air carriers must comply with in addition to minimum requirements of ICAO for international commercial air transport to / from / through the territory of the U.S.A.
- **Hazard:**
  Is a condition, event, or circumstance that could lead to or contribute to an unplanned or undesired event, or;
  Condition, object or activity with the potential of causing injuries to personnel, damage to equipment or structures loss of material, or reduction of ability to perform a prescribed function.
- **Helicopter:**
  A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.
  Note.— Some States use the term “rotorcraft” as an alternative to “helicopter”.
- **Human Factors**
  Factors dependent on individual human judgment or response which could contribute to the possibility of the occurrence of an incident or accident.
- **Incident**
  An occurrence, other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.
- **Inspection**
  Activity such as measuring, examining, testing or gauging one or more characteristics of products or services and comparing the results with specified requirements in order to establish whether conformity is achieved for each characteristic.
- **International Air Transport Association (IATA)**
  A non-governmental agency participating in the work of ICAO by supporting ICAO standards and recommended practices and by promoting safe practices in the aviation industry.
- **International Civil Aviation Organization (ICAO)**
  A body of signatory or contracting states which establishes the obligations and responsibilities of states to ensure safe international air transport for all carriers operating within their respective territories.
- **Joint Aviation Authorities (JAA)**
  The joint CAA of European states empowered to monitor, control, and enforce aviation safety to / from / through the territory of Western Europe.
- **Joint Aviation Requirements (JAR)**
  Special requirements of Western European States which air carriers must comply with in addition to minimum requirements of ICAO for international commercial air transport to / from / through the territory of Western Europe.

- **Key Performance Indicator (KPI)**
  Aspects of performance with major impact on customer satisfaction and business activities which are measured on a regular basis to track performance for continual improvements in safety and quality.
- **License**
  A legal permit authorizing one to perform a particular activity or engage in a particular profession.
- **Maintenance**
  The routine servicing, repair and inspection of aircraft and engines to ensure safe operation.
- **Misidentified information:**
  Information arising from occurrence reports from which all personal data such as names or addresses of natural persons have been removed.
- **Mitigation:**
  Measures to eliminate the potential hazard or to reduce the risk probability or severity,
- **Monitoring**
  Keeping regular watch over activities to track performance.
- **Non-conformance**
  Any deviation from or failure to comply with established policy, procedures, documentation, or work instructions.
- **Occurrence:**
  any safety-related event which endangers or which, if not corrected or addressed, could endanger an aircraft, its occupants or any other person and includes in particular an accident or serious incident.
- **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.
- **Organizational Structure**
  The structure of the Nesma Airlines organization defining roles, responsibilities, authority, channel of communication and the chain of command.
- **Preventive Action**
  Any action or major intended to prevent hazards from developing which could otherwise result in accidents.
- **Process**
  A series of steps, actions, or majors which take and input and modify it to produce an output.

- **Product**

The final output, outcome, or commodity resulting from a particular process

- **Quality**

Compliance with requirements; total customer satisfaction.

- **Quality Assurance**

A function which monitors and ensures the quality of work performed within a particular department in compliance with requirements.

- **Reporter:**

A natural person who reports an occurrence or other safety-related information pursuant to this Regulation.

- **Risk:**

An expression of the impact of an undesired event in terms of event severity and event likelihood / probability (The chance of loss or injury, measured in terms of severity and probability). The chance that something is going to happen and the consequences if it does.

- **Risk mitigation:**

The process of incorporating defenses, preventive controls or recovery measures to lower the severity and/or likelihood of a hazard's projected consequence

- **Risk Probability:**

The feasibility that a situation of danger might occur.

- **Risk Management;**

The process by which Risk Assessment results are integrated with political, social, economic, and engineering considerations for decisions about need/methods for risk reduction, or;
The identification, analysis and elimination (and/or mitigation to an acceptable or tolerable level) of those hazards, as well as the subsequent risks, that threaten the viability of an organization.

- **Safety:**

Is a condition in which the risk of harm or damage is limited to an acceptable level? Or;
The state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard Identification and risk management.

- **Safety information:**

Safety data processed, organized or analyzed in a given context so as to make it useful for safety management purposes.

- **Safety management system:**

A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

- **Safety objective:** A brief, high-level statement of safety achievement or desired outcome to be accomplished by the State safety program or service provider's safety management systems.

Note. — Safety objectives are developed from the organization's top safety risks and should be taken into consideration during subsequent development of safety performance indicators and targets.

- **Safety Management System SMS:**

A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

- **Safety Office:**

Serves as a focal point for safety-related activities, acts as a repository for safely reports and information and provides expertise or safety management line managers.

- **Safety Oversight:**

A function by which states ensure effective implementation of safety related ICAO standards and recommended practices (SARP) and associated procedures or documents contained in the Annexes (and related documents) of the convention on Internal Civil Aviation; safety oversight ensures that the aviation industry provides a level of safety equal to or better than defined by SARP.

- **Safety Performance Indicators:**

Are a measure (or metric) used to express the level of safety performance achieved in a system.

- **Safely Performance Targets:**

The required level of safety performance for a system. A safety performance target comprises one or more safety performance indicators, together with desired outcomes expressed in terms of these indicators.

- **Safety Program:**

An integrated set of regulations and activities aimed at improving safety.

- **Safety Requirements:**

Are operational procedures, technology, systems and programs to which measures of reliability, availability, performance and / or accuracy can be specified.

- **Security Threat**

A potential hazard to the security of operations which could harm or endanger property, human life, or the safety of operations.

- **Service**

Work performed to benefit another individual, company or organization.

- **Senior Management**

A Team/Group of Managers/Directors including the Accountable Manager as determined by the Board of Directors.

- **Severity:**

The possible consequences of a situation of danger, taking as reference the worst foreseeable situation.

- **Standards**

An accepted level of performance.

- **State**

A country as defined by legal boundaries and territory under the control of a formal government.

- **Supplier**

A person, company or organization who/which has agreed to provide products or services for the benefit of another.

- **System Safety Discipline**

Is defined as the application of special technical and managerial skills to the systematic, forward-looking identification and control of hazards throughout the life cycle of a project, program, or activity.

- **Violation:**

A deliberate act.

Chapter (1)

Introduction to Safety Management System

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1.1 Management Safety Commitment and Accountability

1.1.1 Among our core values, Nesma Airlines will include:

- Positive and healthy safety culture;
- Ethical behavior; and
- Valuing people.

1.1.2 Our fundamental safety beliefs are:

- Safety is a core business and personal value.
- Safety is a source of our competitive advantage.
- Our business will be strengthened by making safety excellence an integral of all aviation activities.
- All accidents and serious incidents are preventable.
- All levels of line management are accountable for our safety performance, starting with the Accountable Executive.

1.1.3 The five core elements of our safety approach include:

- Top management commitment:
  - Safety excellence will be a component of our mission.
  - Senior management will hold line management and all employees accountable for safety performance.
- Responsibility and accountability of all employees:
  - Safety performance will be an important part of our management / employee evaluation system.
  - We will recognize and reward safety performance.
  - Before any work is done, we will make everyone aware of the safety rules and processes, as well as each one’s personal responsibility to observe them.
- Clearly communicated expectations of zero accidents:
  - We will have a formal written safety goal, and we will ensure that everyone understands and accepts that goal.
  - We will have a communications and motivation system in place to keep our employees focused on the safety goal.
- Auditing and measuring performance for improvement:
  - Management will ensure that regular safety audits are conducted.
  - We will focus our audits on the behavior of people, as well as on the conditions of the workplaces.
  - We will establish performance indicators to help us evaluate our safety performance.

- Responsibility of all employees:
  - Each of us will be expected to accept responsibility and accountability for our own behavior.
  - Each of us will have an opportunity to participate in developing safety standards and procedures.
  - We will openly communicate information about safety incidents and will share the lessons learned with others.
  - Each of us will be concerned for the safety of others in our organization.

1.1.4 Our objectives of the safety process include:

- ALL levels of management will be clearly committed to safety.
- We will have clear employee safety metrics, with clear accountability.
- We will have open safety communications.
- We will involve all relevant staff in the decision-making process.
- We will provide the necessary training to build and maintain meaningful safety leadership skills.
- The safety of our employees, customers and suppliers will be a strategic issue of the organization.
- Safety, consistent with mission requirements, is designed into the system in a timely, cost-effective manner.
- Hazards associated with the system (and its component subsystems) are identified, tracked, evaluated, and eliminated, or the associated risk is reduced to a level acceptable
- Safety analyses and assessments are performed.
- Historical safety data, including lessons learned from other systems, are considered and used in safety assessments and analyses.
- Minimum risk is sought in accepting and using new technology, materials, or designs, techniques.
- Changes in design, configuration, or mission requirements are accomplished in a
- Manner that maintains a risk level acceptable
  Significant safety data are documented as “lessons learned” and are submitted to ECAA.

1.2 Safety Policy, Objectives and Goals

1.2.1 Safety Policy

- Safety is a vital component of NESMA AIRLINES mission. Safety is also a source of competitive advantage. All levels of line management are accountable for safety performance, starting with the Accountable Executive, which will demonstrate continual commitment to safety by making safety excellence an integral part of all flight and ground activities through the policies, procedures and programs contained in this manual.
- It is vital that all personnel understand that they also bear the responsibility of carrying out their duties in the safest manner possible. Before any work is done, each personnel must be aware of all safety rules and procedures, as well as their personal responsibility to observe them. Safety is an extremely important part of personnel's performance and will be recognized.
- To achieve appropriate safety standards efforts must be made and implemented to prevent injury or damage to people and property both on the ground and in the air before they occur.
- NESMA AIRLINES requires all staff to exercise the highest degree of care in al l operations to minimize the possibility of an accident resulting in injury or damage.
- To accomplish this NESMA AIRLINES operates under the following:
    i. Direct responsibility for the safety of an operation rests with the manager of that operation
    ii. Each individual is personally responsible to perform his/her duties giving primary concern to his/her own safety as well as that of his/her fellow personnel, our clients and the property entrusted to their care.
- Management at all levels shall provide a means for prompt corrective action to eliminate unsafe acts, conditions, equipment or mechanical hazards.
- Although the safety procedures and policies contained within this manual address the majority of our operations, unusual situations may arise. Contact the Safely & Quality Directorate if you have any questions or need assistance in implementing specific standards.
- All company policies should be reviewed every two years and to be communicated throughout the organization using company communication tools.

Nesma Airlines Believes that every task can and must be done safely

1.2.2 Corporate Policy Statement

Nesma Airlines
نسما للطيران

Corporate Policy Statement

The quality of our management system is essential for our business functions. Our commitment is to ensure measuring and evaluating on a continuing basis, and making changes that improve the management system and the culture. Ideas for improvement may come from internal and external sources; therefore we are constantly monitoring all sources and willing to make changes as necessary to keep the management system refreshed and strongly focused on improving operational safety and security performance.

All levels of management and all employees are accountable for the delivery of this highest level of performance, starting with the Accountable Executive

We are committed to:

- Comply with all applicable regulations and the company standards;
- Provide the necessary resources to satisfy operational safety and security outcomes.
- Ensure continual improvement of quality, safety and security management systems;
- Ensure continual improvement of operational performance;
- Preform regular review of performance-based indicators by senior management;
- Preform regular analysis of malfunctions or undesirable operational results;
- Preform continuous training of the Nesma airline's employees to reach the highest levels of efficiency in the implementation of the company operations.
- Implement the team work in all areas to perform the company operations with high efficiency.
- Promote the safety and security awareness as Nesma airlines primary goal is safety and security.
- Follow-up of corrective actions and their effectiveness in improving operational performance.
- Use the good practices to minimize and eliminate risks.
- Optimum use of safe personal protective equipment.
- Communicate all our policies throughout the organization.
- Review all company policies every 2 years to ensure continued relevance to the company standards.
- Inform the operational personnel throughout the organization of their responsibility to comply with the applicable laws, regulations and procedures in all locations where operations are conducted. In the event of willful or negligent disobedience to those rules, regulations, policies, and/or procedures, the personal concerned shall become subject to disciplinary, legal or penal action however nothing contained shall prevent personal from exercising their own best judgment during any situation for which the company standards make no provisions or in an emergency.

Accountable Executive
Karim Baky

Revised Jun. 2023

1.2.3 Corporate Safety Policy Statement

Nesma Airlines
نسما للطيران

Corporate Safety Policy Statement

Safety is one of our core business functions, we are committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure that all our aviation activities take place under an appropriate allocation of organizational resources, aimed at achieving the highest level of safety performance and meeting regulatory requirements, while delivering our services.

All levels of management and all employees are accountable for the delivery of this highest level of safety performance, starting with the Accountable Executive

Our commitment is to:

- support the management of safety through the provision of all appropriate resources that will result in an organizational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety with the same attention to results as the attention to the results of the other management systems of the organization;
- ensure that the management of safety is a primary responsibility of all managers and employees;
- clearly define, for all staff, managers and employees alike, their accountabilities and responsibilities for the delivery of the organization's safety performance and the performance of our safety management system;
- establish and operate hazard identification and risk management processes, including a hazard reporting system, in order to eliminate or mitigate the safety risks of the consequences of hazards resulting from our operations, to achieve continuous improvement in our safety performance;
- ensure that all staff are provided with adequate and appropriate aviation safety training, are competent in safety matters, and are allocated only tasks commensurate with their skills;
- establish and measure our safety performance against realistic safety performance indicators and safety performance targets;
- continually improve our safety performance through continuous monitoring and measurement, regular review and adjustment of safety objectives and targets, and diligent achievement of these;
- ensure that externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

senior management is commitment to ensure:

- Compliance with applicable regulations and standards of the Operator;
- The management of safety and security risks to aircraft operations;
- The promotion of safety and security awareness;
- Continual improvement of operational performance;
- Regular review of safety performance indicators by senior management;
- Regular analysis of malfunctions or undesirable operational results;
- Follow-up of corrective actions and their effectiveness in improving operational performance.

Revised Jan 2023

Accountable Executive
Karim Baky

Nesma Airlines
نسما للطيران
Quality Department

1.2.4 Corporate Safety Reporting Policy Statement

Nesma Airlines
نسما للطيران

Corporate Safety Reporting Policy Statement

The key objective of Nesma Airlines safety reporting system is to enhance the safety of our company's aviation activities through the collection of reports on actual or potential safety deficiencies that would otherwise not be reported through other channels. Such reports may involve occurrences, hazards or threats relevant to the safety of our aviation activities. This system does not eliminate the need for formal reporting of accidents and incidents according to our company SOPs, as well as the submission of mandatory occurrence reports to the relevant regulatory authorities.

The Safety reporting system is a voluntary, non-punitive, confidential occurrence and hazard reporting system administered by the Safety & Quality Department. It provides a channel for the voluntary reporting of aviation occurrences or hazards relevant to our organization's aviation activities, while protecting the reporter's identity.

All levels of management and all employees are accountable for the delivery of this highest level of safety performance, starting with the Accountable Executive

Our commitment is to:

- Achieve the safest flight operating standards possible. To achieve this, it is imperative that we have uninhibited reporting of all incidents and occurrences that compromise the safe conduct of our operations. To this end, every employee is responsible for communicating any information that may affect the integrity of flight safety. Such communication must be completely free of any form of reprisal.
- Encourages and perhaps even provides incentive for individuals to report hazards and operational deficiencies to management.
- Assures personnel that their candid input is highly desired and vital to safe and secure operations.
- Do not take disciplinary action against any employee who discloses an incident or occurrence involving flight safety. This policy shall not apply to information received by the company from a source other than the employee, or which involves an illegal act, or a deliberate or willful disregard of promulgated regulations or procedures.
- Develop our methods of collecting, recording and disseminating information obtained from Safety Reports to protect to the extent permissible by law, the identity of any employee who provides flight safety information.
- Urge all staff to use our flight safety program to help Nesma Airlines become a leader in providing our customers and employees with the highest level of flight safety.
- Review periodically the safety reporting policy to ensure continuing relevance to our company.

Safety Office Contacts:
Mail: safety@nesmairlines.com
Phone: + (202) 26217591/2/3/4 ext. 201 & 207
Mobile: + (2) 01000012905

Accountable Executive
Karim Baky

Nesma Airlines
نسما للطيران
Quality Department

Revised Jan. 2023

1.2.5 Safety Goals & Objectives

NESMA AIRLINES intends to provide a safe and healthy working environment for all of its personnel and the highest possible standards of safety for all customers by the elimination of all recognized hazards.

- NESMA AIRLINES objectives of the safety process include:

Statistical measures are often used to indicate a level of safety, e.g. the number of accidents per hundred thousand hours, or fatalities per thousand sectors flown. Such quantitative indicators mean little by themselves, but they are useful in assessing whether safety is getting better or worse over time.

Nesma Airlines Safety Goals are:

i. To identify and eliminate hazards.
ii. To provide a safe, healthy work environment for all personnel.
iii. To minimize all types of occurrences (injuries, incidents, serious incidents & accidents).
iv. To minimize damage to aircraft and injury to people.
v. To investigate occurrences (incidents, serious incidents and accidents) with a view to establish root cause and to make recommendations to prevent future recurrence.
vi. To promote a 'Positive Reporting Culture' throughout the organization.
vii. To conduct an effective Flight Data Analysis Program across all fleet.
viii. To provide Safety Management System (SMS) education and training to all personnel.
ix. To improve the effectiveness of the SMS through safety audits that reviews all aspects of the SMS.
x. To perform hazard and risk analysis for all proposed new equipment acquisitions, facilities, operations and procedures.
xi. To disseminate safety related information to the appropriate personnel.
xii. To maintain effective crisis management capability which is designed to respond, contain and manage any major occurrence or event in a safe and secure manner, whilst ensuring a safe continuation of normal operations.

To achieve these goals, the safety & quality assurance department in coordination with company departments will developed maintain measurable safety objectives which will:

i. Reduce the occurrence of accidents and incidents.
ii. Minimize the damage and severity of those accidents and incidents that do occur.
iii. Prevent damage and injury to property and personnel result of operations.
iv. Incorporate safety into all operational, maintenance, and training activities,
v. Consider the safety implications of proposed new equipment, facilities; operations and procedures.
vi. Provide programs for the reporting, investigation and analysis of hazards and events.
vii. Comply with all internal policies and procedures, laws and regulations to unsure aviation safety.
viii. Minimize insurance costs and exposure to litigation or penalties.

Note: The safety objectives and the associated SPI's will be documented either as a part of the safety review board meeting minutes and/or each department as a controlled document (ref. to 3.2)

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1.3 Key Safety Personnel Responsibilities

1.3.1 General

i. Nesma Airlines safety system shall provide guidance on the responsibilities of management personnel, to ensure that all have a safe and healthful work environment, operations are conducted safely, and compliance with regulatory requirements is maintained. All Nesma Airlines managers are individually responsible to ensure operations are conducted in a safe and efficient manner, protecting all staff and equipment.

ii. All managers are responsible for, and have a legal obligation to ensure, a safe and healthful workplace free from recognized hazards, that may cause serious injury or illness. Taking reasonable actions to protect people, property and the environment discharges this responsibility. Some specific responsibilities are:

- Ensuring State, and Company safety and health standards are followed.
- Monitoring contracted services' personnel for compliance.
- Ensuring accident / incident, damages, and injuries are promptly reported and investigated,
- Ensuring a. copy of Nesma Airlines Safety Management Manual SMM is made available for employee's use as reference at each work location.
- Inspecting workplaces on a regular basis to identify potential safety hazards and taking effective corrective actions to permanently eliminate hazards.
- Providing staff safety training
- Enforcing safety rules and procedures,
- Ensuring protective equipment is available and used by everyone – when applicable.
- Providing the necessary tools, equipment, and facilities to perform work tasks safely.

iii. All personnel must be familiar with not only the safety policies and programs in this manual, but also those found in Nesma Airlines general operations manual and all other manuals applicable to an employee's given job function,

iv. The safety policies and programs for Nesma Airlines will be disseminated to employees during initial and recurrent training classes provided by the applicable Departments.

v. By adhering to established rules and procedures, each employee, from the accountable executive to the front line, can help collectively achieve Nesma Airlines goal of maintaining a maximum level of safety.

vi. Management's commitment to safety is fundamental and must be readily visible at all levels; every opportunity for actively demonstrating this commitment to safety must be taken.

vii. It is the responsibility of each operating Department head, and each employee, to correct or prevent safety and quality non-conformities. To support this objective.

viii. Each operating assigned coordinator (supervisor) shall have a program to ensure action is taken to correct and prevent safety and quality non-conformities and that corrective and preventive action shall be appropriate to the effects and causes of nonconformities/potential non- conformities.

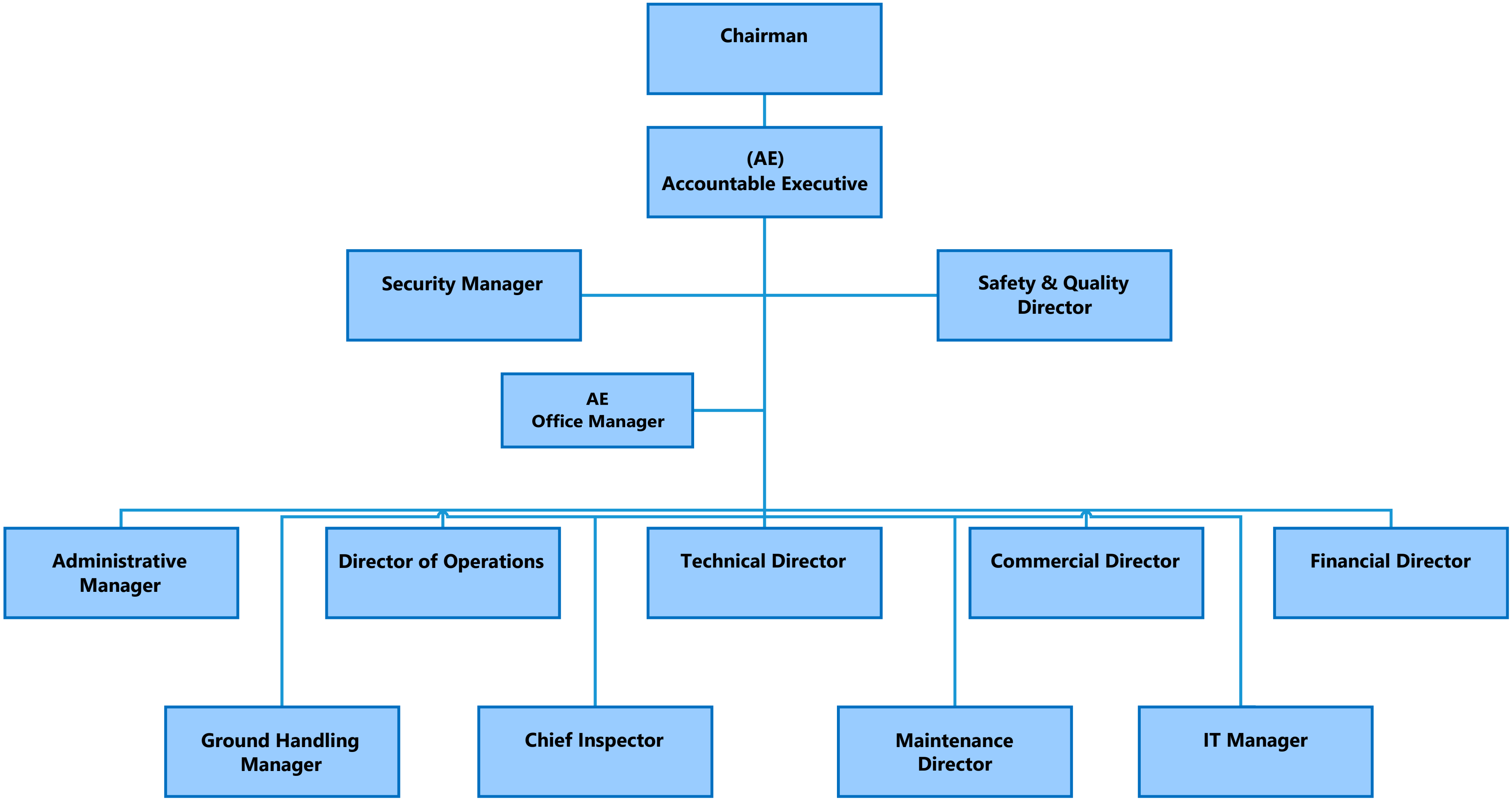
1.3.2 Safety & Quality Department organization

The Safety & Quality Department focuses on the administration and oversight of the SMS and responsible for organizational implementation of an SMS on behalf of the AE.

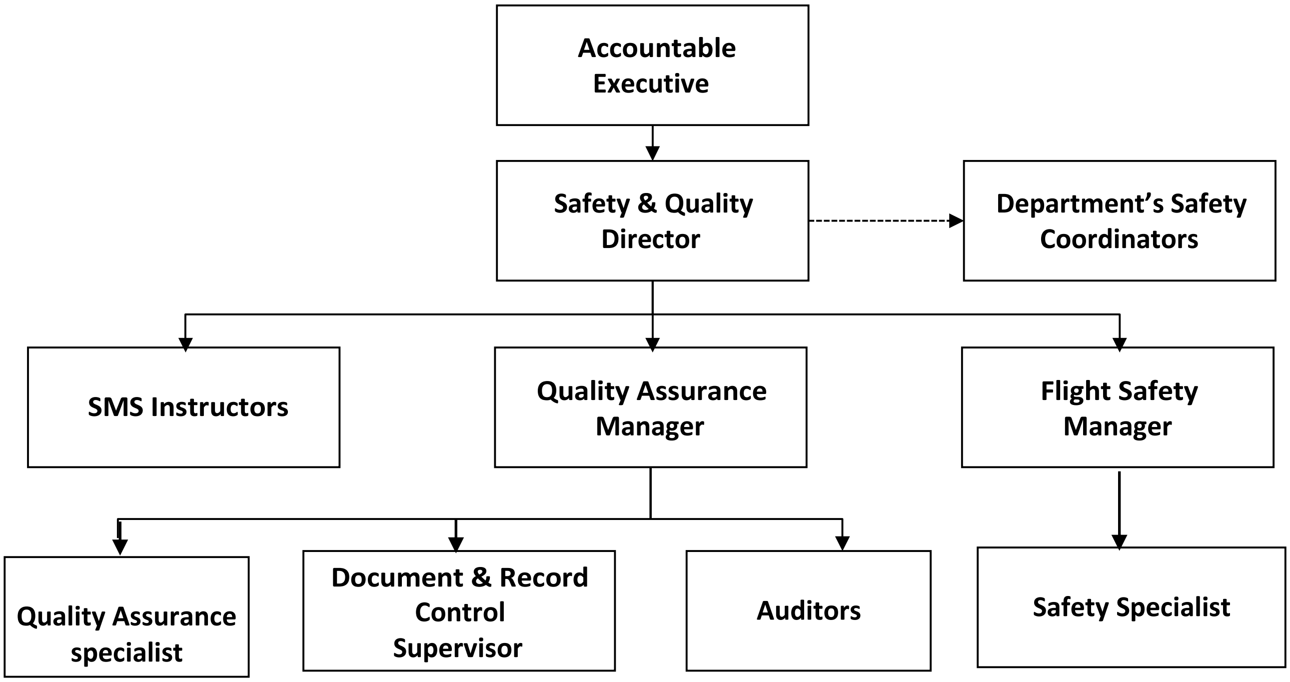
The Safety & Quality Department is managed by the safety & quality director that reports directly to the AE, and accepted as a nominated post holder by the Egyptian Civil Aviation Authority.

The Safety & Quality Department includes a flight Safety manager, a quality assurance manager and auditors. To assist the safety & quality director, the AE may assign additional personnel to the safety & Quality Department, either full-time or as an additional duty to any employee. When such appointments are made, these employees will report to the safety& quality director.

1.3.1.1 Nesma Airlines Organization Chart



1.3.1.2 Safety & Quality Organization Chart



1.3.3 (Accountable Executive)

Ref. To ECAR 19.103 & Corporate Manual 1.2.1

Nesma Airlines Accountable Executive accepted by the Egyptian Civil Aviation Authority as the nominated post holder.

The AE has the accountability for operational quality, safety and security performance, and the authority to take action to ensure the management system is effective, his authority also includes financial control, to make policy decisions, provide adequate resources, resolve operational quality, safety and security issues and, in general, ensure necessary system components are in place and functioning properly.

The AE is ultimately responsible for setting the company policies and objectives, and for ensuring operations are conducted in accordance with conditions and restrictions of the Air Operator Certificate (AOC), and in compliance with requirements of applicable authorities (i.e. regulations), as well as its own policies and procedures, which may exceed existing regulations or address areas that are not regulated.

In an SMS, the AE has ultimate responsibility and accountability for:

- The safety of the entire operation together with the implementation and maintenance of the SMS;
- Ensuring the SMS is properly implemented in all areas of the organization and performing in accordance with specified requirements.
- Establishing an oversight system to ensure the quality of the company's services, in accordance with regulatory requirements and in compliance with the Safety Management System.
- Authorizing a safety policy that indices Nesma Airlines safety objectives and its commitment to safety;
- Assuming the leadership role to ensure commitment throughout the company, particularly at senior management level, to the safety management policy intent and safety management system requirements;
- Ensuring allocation of resources necessary to manage safety and security risks to aircraft operations
- Ensuring that Nesma Airlines management and staff are aware and held accountability for their safety performance;
- Ensuring that Nesma Airlines safety management system and operation performance are evaluated for effectiveness on a regular basis.

1.3.4 Safety & Quality Director

Ref. to ECAR 19.103 & Corporate Manual 1.2.5

The safety & quality director is designated by the AE and reporting to him. He is accepted by the authority as a nominated post holder, and he is responsible for organizational implementation of SMS, the day-to-day administration and oversight of SMS operation throughout the organization on behalf of the AE.

Qualifications

The safety & quality director is a nominated management position accepted by ECAA and he is qualified as per ECAR requirements 19.103 (i).

The safety & quality director has the authority and responsibility for:

- The day-to-day operation and oversight of SMS operation throughout the organization;
- Planning and controlling the safety department budget;
- Developing and maintaining of the safety policy, safety standards and safety management system;
- Enhancing safety culture in the company using all available safety recourses;
- Deploying the company Safety tool;
- Corporate SMS documentation (drafting, validation, approval and maintenance);
- Developing the company's risk management system and ensuring its relevance, adoption and proper use by the company;

- Selecting the most appropriate risk mitigation measures for those risks deemed unacceptable; coordinating safety committees;
- Overseeing the performance of the company's safety management activities to evaluate its effectiveness and providing advice on potential improvements to safety performance;
- Overseeing hazard identification systems effectiveness, for example: (Occurrence investigations & Incident reporting systems & Data analysis programs); Reviewing and reporting on compliance with safety management policies, plans, systems and procedures, ensuring safety issues are reported in a timely manner;
- Providing regular reports on safety performance and giving independent advice to the AE and all departments within the company.
- Arrangement of the safety committee meetings, including meeting agenda topics, and keeps the meetings records;
- Establishing a system for the safety management education and safety awareness;
- Disseminating public communications on safety issues;
- Establishing a safety audit and surveillance system;
- Effective interface with the ECAA regarding safety matters;
- Establishing industry liaison on safety matters;
- Establishing safety relations with international bodies;
- Managing, developing, and maintaining Nesma airlines ERP;
- ERP implementation;
- Coordinating the regulatory authority's Mandatory Occurrence Reporting (MOR scheme);
- Assisting with the investigation of accidents and conducting and coordinating investigations into incidents;
- Investigates all maintenance and operations occurrences to determine the root causes and appropriate courses of action;
- All investigation reports will be reviewed during Safety Committee meetings.

Deputized by: Flight Safety Manager

1.3.5 Flight Safety Manager

Job Description

Ref. to Corporate Manual 1.2.5

The flight safety manager reports directly to the safety & quality director. His main assignment is to manage, maintain the flight safety analysis program and develop the required analysis and reports.

Qualifications

- Holds either an airline transport pilot or commercial pilot license;
- At least 4 years' experience as a captain on company's fleet;
- Passed successfully the required safety and flight data monitoring training courses;
- Broad operational knowledge and experience in aircraft operations;
- Well-developed interpersonal skills;
- Computer literacy;
- The ability to relate to all levels, both inside and outside the organization;
- Organizational ability;
- Good analytical skills.

Safety responsibility

- Provides safety & regulatory oversight of all flight operation practices, facilities, and training;
- Addresses flight operation concerns assigned by Internal Evaluation.
- Manages, maintains the FDM program (AIRFASE) and develop required analysis and reports;
- Investigate flight safety concerns to determine the cause and appropriate courses of action;
- Reviews voluntary & occurrence reports for safety related issues and/or trends;
- Coordinate with operations director, chief pilot, and training manager for recommended reactions related to AIRFASE extracted events flight safety issues;
- Ensure safety issues are addressed., documented and tracked Works on operations activities to identify hazards and apply the needed risk assessment;
- Performs safety audits of flight operations, data will be documented and evaluated to identify any areas of concern;
- Updating the safety & quality director for all flight safety status;
- Participates in Nesma Airlines safely committees and events;
- Continuous coordination with the Nesma Airlines chief inspector.

Deputized by: Safety & Quality Director

1.3.6 Quality Assurance Manager

Ref to Corporate Manual 1.2.5
The quality assurance manager is reporting to the safety and quality director, he is appointed to oversee the implementation of the activities and processes associated with the quality assurance program and responsible for the performance of the quality assurance program.
The quality assurance manager is "operationally independent" in a manner that ensures objectivity is not subject to bias due to conflicting responsibilities.

Qualifications:

- Holds either operational or technical license;
- At least 10 years of experience in the operational or technical field, including 3 years auditing experience;
- Formal training in the line management safety management system;
- Formal training in the quality audits;
- Formal training in risk management;
- Broad operational and technical knowledge and experience in aircraft operations.

Responsibilities

- Sets out the methods, writes and validates general procedures for oversight activities (oversight programme, auditing, surveys, inspections, training of auditors and document and record management);
- Provides monitoring of the regulatory quality requirements;
- Monitoring the performance of the quality and safety assurance program;
- Ensuring communication and coordination with operational managers in the management of operational risk through quality monitoring tools;
- Perform monitoring and surveillance of normal operations to ensure adherence to standard procedures and prepare reports for actions;
- Tracks and analyzes the inputs and outputs of the company safety reporting system & recommend corrective actions;
- May Participates in Nesma Airlines safety committees and assists in Procedures & events;
- Maintain reviews for the safety & quality programs and reports any deficiencies to the quality & safety director;
- Dissemination of information to management and non-management operational personnel as appropriate to ensure an organizational awareness of relevant quality assurance issues and results.

Deputized by: Safety & Quality Director

1.3.7 Auditors

Ref to Corporate Manual 1.2.5
Auditor are reporting to the quality assurance manager. Their main assignment is to perform scheduled and unscheduled audits on all company operational and technical activates. Auditors from other departments may be utilized in the safety and quality audits, as long as they are functionally independent from the operational activities they are audited, and meets the qualifications required by Nesma Airlines quality assurance program.

Qualifications

- Holds either operational or technical license;
- At least 3 years of experience in the operational or technical field
- Has passed successfully training courses in the safety management system;
- Has passed successfully training courses in the quality audits;
- Broad operational and technical knowledge and experience in aircraft operations.

Safety Responsibilities:

- Performs safety & quality scheduled and unscheduled audits on facilities and practices, data will be documented and evaluated to identify any areas of concern;
- Follow up corrective actions feedback for resulted findings;
- Performs the non-routine surveillance checks on line operations and maintenance activates;
- Assists in ensuring procedures are in accordance with applicable ECARS and Nesma Airlines policies; Addresses safety & quality concerns assigned by the Internal Evaluation;
- Investigate all safety concerns to determine the cause and recommend appropriate course of action.

1.3.8 Document and Record Control Supervisor

Minimum qualifications:

- Proven work experience as a document and record controller or similar role;
- Basic knowledge of the aviation regulatory requirements
- Hands-on experience with MS Office and MS Excel
- Knowledge of Electronic Document Management Systems
- Proficient typing and editing skills
- Data organization
    - Has passed successfully training courses in the safety management system; Has passed successfully training courses in the quality audits

Responsibilities

1) Monitor the company document control program to be applied and implemented in all Company's departments & according to (ECAA and IOSA) requirements.
2) Ensure that each department will assign one staff to be in charge as (Library Keeper and document coordinator) for applying the document control program in his department in coordination with document and record control department.
3) Review all documentation system elements are applied in all the company's manuals to be one standard as per mentioned in corporate manual item 2.1.6.
4) Review the record system process are applied in all the company's documents as per mentioned in corporate manual item 2.2.4

1.3.9 Safety Management System (SMS) Instructors

SMS instructors are reporting to Safety & Quality Director and responsible for:

- Design, produce, and implement training curriculum for line operations staff (flight crew, cabin crew, dispatch, ground handling, & maintenance) in accordance with regulatory requirements;
- Develop SMS training according to organizational needs;
- Develop SMS training through practical exercises, role play and presentations;
- Evaluate the effectiveness of training and implement corrections;
- Prepare SMS annual training Plan.

1.3.10 Department's Safety Coordinators

Department's safety coordinators are highly experienced personnel selected from each department by the safety & quality director in coordination with department managers/directors, they are reporting to their departments heads and coordinate with the safety and quality department to promote for safety in their areas, to enhance the safety reporting culture in their departments and to assist the safety and quality department to follow up the effectiveness of the corrective actions taken.

1.3.11 All employees (operational & technical)

All employees shall perform their assigned duties with safety in mind. Each employee is responsible and personally accountable for:

- Performing only Maintenance / operational functions for which they are trained.
- Observing and following the established safety and health policies, practices, procedures and operational requirements as per SMM.
- Notifying management of any unsafe flight operations conditions. Operating only that equipment on which they have been trained and are qualified to operate, using required personal protective equipment as trained.
- Availing themselves of safety and health training.
- Keeping work areas free of recognized hazards:
- Reporting injuries, illnesses, damage, incidents, and accidents in accordance with Nesma Airlines policy and procedure.
- Every employee is expected to accept responsibility and accountability for their actions. Each will have an opportunity to participate in developing safety standards and procedures by communicating their safety concerns and suggestions to management. All must demonstrate concern for the safety of passengers and for others in the Nesma Airlines organization.

- All personnel must be familiar with not only the safety policies and programs in this manual, but also those found in the Nesma Airlines general operations manual and all other manuals applicable to any employee's given job function. The safety policies and programs for each Department of Nesma Airlines will be disseminated to employees during initial and recurrent training classes provided by the applicable Departments. By adhering to established rules and procedures, each employee, from the Accountable Executive to the front line, can help collectively achieve Nesma Airlines goal of maintaining a maximum level of safety.
- All personnel performing safety related work are required to be mentally, as well as physically fit, for duty. Those personnel that do not meet this requirement will immediately cease those duties and notify their supervisor. Supervisors aware of, or made aware of, an employee performing safely related work that is not mentally, as well as physically fit, for duty will immediately have that employee cease those duties.

1.3.12 Quality Assurance Specialist

Job description

The quality assurance specialist is reporting to the safety and quality director, he is appointed to oversee the implementation of the activities and processes associated with the quality assurance program and assist for the performance of the quality assurance program.

Qualification

1- Formal training in the quality basics
2- Formal training in the quality audits;
3- Formal training in the safety management system
4- sufficient knowledge and experience with A/C (operational and technical).

Responsibilities

1-Assist document control system manager.
2-Assist in monitoring of the regulatory quality requirements.
3-Assist in monitoring the performance of the quality and safety assurance program.
4-Assist in performing monitoring surveillance of normal operations to ensure adherence standard procedures and prepare reports for actions.
5-Tracks and analyzes the inputs and outputs of the company safety reporting system & recommend corrective actions.
6- May Participates in Nesma Airlines safety committees and assists in Procedures & events
7-Reviews for the safety & quality programs and reports any deficiencies to the quality & safety director.
8-Assist in activation of IMX system.

1.3.13 Safety Specialist

Job Description
The flight safety specialist reports directly to the safety & quality director. his/her main assignment is to manage, maintain the safety management program and develop the required analysis and reports.
Qualifications:
1. Well-developed interpersonal skills
2. Computer literacy;
3. Formal training in the safety management system
4. Formal training in the quality basics
5. Formal training in the safety audits;
6. Sufficient knowledge and experience with A/C (operational and technical).

Responsibilities :
1. Assist in the day-to-day operation and oversight of SMS operation throughout the organization
2. Assist in developing and maintaining Corporate SMS documentation
3. Assist in maintaining company's risk management system and ensuring its relevance, adoption and proper use by the company;
4. Assist overseeing the performance of the company's safety management activities to evaluate its effectiveness and providing advice on potential improvements to safety performance
5. Assist overseeing hazard identification systems effectiveness (Occurrence Investigations & Incident reporting systems & Data analysis programs);
6. Assist reviewing and reporting on compliance with safety management policies, plans, systems and procedures, ensuring safety issues are reported in a timely manner;
7. Assist disseminating public communications on safety issues;
8. Assist Establishing a safety audit and surveillance system;
9. Assist investigates all maintenance and operations occurrences to determine the root causes and appropriate courses of action;
10. Assist identify and evaluate the risks for the audit;

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1.4 Safety Committee

The objective of the SMS committee is to provide a forum in which to discuss issues related to the safety performance and the health of the company SMS. The SMS committee makes recommendations and decisions concerning safety policies and procedures, and reviews safety performance results.

The objective of the SMS committee is to provide a source of expertise, guidance and advice on safety matters to the organization.

One of the main tools of the safety committee is the outcomes and statistics, which are analyzed through the committee and with line managers on regular basis meetings.

Based on company scale the safety committee acts as the safety review board (SRB) and safety action group (SAG), provides a method of obtaining agreement for action on specific safety related issues. Meeting minutes and action items will be recorded as part of normal committee functions and be made available to each of the members of the SMS committee.

Details of accidents, serious incidents and any safety concerns that may be discussed at this meeting are to be regarded as confidential.

The safety committee meetings will held **twice a year**, the follow up of the committee outputs and recommendations will be through the action plan.

Specific members may discuss some of the safety topics such as flight safety analysis program results, as aside of the committee.

1.4.1 Safety Committee Members

- The accountable executive is the chairman of the SMS committee; in his/her absence, the safety and quality director will chair the SMS committee meeting.
- Safety & Quality Director
- Operations Director.
- Technical Director.
- Flight Safety Manager.
- Chief Pilot

- Chief Inspector.
- In-flight services manager, invited if required by the meeting agenda.
- Ground Handling Manager, invited if required by the meeting agenda.
- Others, invited if required by the meeting agenda.

1.4.2 Safety Committee Meeting Agenda

The safety committee meeting agenda will be designed to review all the aspects of the company. SMS. The committee members are responsible to oversees, monitors and reviews the performance of the company SMS.

The following items are consider as the meeting agenda outline that will be discussed during the meeting

1. Monitors Safety performance against the safety policy and objectives;
2. Monitors Effectiveness of the SMS;
3. Monitors Effectiveness of the safety oversight of sub-contracted organizations;
4. Monitor the effectiveness of the organization’s safety management processes.
5. Oversees and reviews the operational effectiveness of the safety risk management processes;
6. Oversees and reviews appropriate resolution and mitigation of identified risks;
7. Assessment of the safety impact of operational changes;
8. Oversees and reviews the implementation and the effectiveness of corrective action plans; and ensure that corrective action is achieved within agreed timescales and are being taken in a timely manner;
9. Oversees and reviews the effectiveness of safety recommendations and safety promotion.
10. Oversees and reviews Results of safety data analysis
11. Review and comment on safety-management strategies;
12. Review and comment on safety risk-mitigation strategies;
13. Review and accept safety risk-assessment analysis performed by the company departments
14. Review significant issues arising from safety audits and the flight safety analysis program to ensure appropriate corrective or preventive actions have been implemented and are being monitored for effectiveness in preventing accidents and incidents
15. Oversees and review the effectiveness of the SMS training program.

1.5 SMS Review

1.5.1 Concept of Safety

1.5.1.1 An SMS is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.
1.5.1.2 In order to understand safety management system, it is necessary to consider what is meant by "safety". Depending on one's perspective, the concept of aviation safety may have different connotations, such as:

- Zero accidents (or serious incidents), a view widely held by the travelling public;
- The freedom from danger or risks, i.e. those factors which cause or are likely to cause harm;
- The attitude towards unsafe acts and conditions by employees (reflecting a safe corporate culture);
- The degree to which the inherent risks in aviation are " acceptable ",
- The process of hazard identification and risk, management; and
- The control of accidental loss (of persons and property, and damage to the environment).

1.5.1.3 While the elimination of accidents (and serious incidents) would be desirable, a one hundred percent safety rate is an unachievable goal. Failures and errors will occur, in spite of the best efforts to avoid them. No human activity or human-made system can be guaranteed to be absolutely safe, i.e. free from risk. Safety is a relative notion whereby inherent risks are acceptable in a "safe" system.
1.5.1.4 Safety is increasingly viewed as the management of risk. This primary purpose of this manual is to develop a system at Nesma Airlines for managing the core business process of safety and to ensure compliance with all national and international guidelines on safety management system.
1.5.1.5 Safety is the state in which the risk of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.

1.5.2 Regulatory Requirements

1.5.2.1 Safety has always been the overriding consideration in all aviation activities. This is reflected in the aims and objectives of national and international regulations to ensure the safe and orderly growth throughout the world
1.5.2.2 ICAO differentiates between safety programs and safety management system (SMS) as follows:

- **A safety program is:**

An integrated set of regulations and activities aimed at improving safety, ICAO's Standard and Recommended Practices (SARPs) require that states establish a safety program to achieve an acceptable level of safety in aviation operations. a safety program will be broad in scope, including many safety' activities aimed at fulfilling the program's objectives. A state's safety program embraces those regulations and directives for the conduct of safe operations. The safety program may include provisions for such diverse activities as incident report, safety investigations, safety audits and safety promotion. To implement such safety activities in an integrated manner, require a coherent SMS.

- Safety management system (SMS) is:

An organized approach to managing safety including the necessary organized structures, accountabilities, policies and procedures in accordance with the provision of national regulations,

- The complexity of the SMS should match the organization's requirements for managing safety. At the core of the SMS is a formal risk management process that identifies hazard, assesses and mitigates risk.

1.5.2.3 ECAA requires the individual operators to implement SMS that acceptable by ECAA. As a minimum, such SMS shall:

- Identify safety hazard,
- Ensure that remedial actions necessary to mitigate the risks/hazards are implemented; and
- Provide for continuous monitoring and regular assessment of the safety level achieved.
- Aims to make continuous improvement to the overall level of safety.

1.5.2.4 An organization's SMS shall also clearly define lines of safety accountabilities; including direct accountabilities for the senior management.

1.5.3 Safety culture

1.5.3.1 Safety culture is a natural bi-product of corporate culture. The corporate attitude towards safety influences the employees' collective approach to safety. Safety culture consists of shared beliefs, practices and attitudes. The tone for safety culture is set and nurtured by the words and actions of senior management. Corporate safety culture then is the atmosphere created by management that shapes workers' attitudes towards safety.

1.5.3.2 Safety culture is affected by such factors as:

- Management's actions and priorities;
- Policies and procedures;
- Supervisory practices;
- Safety planning and goals;
- Actions in response to unsafe behaviors;
- Employee training and motivation; and
- Employee involvement or "buy-in".

1.5.3.3 The ultimate responsibility for safety rests with the directors and management of the organization

1.5.3 Positive safety culture

1.5.4.1 Although compliance with safety regulations is fundamental to safety, contemporary thinking is that much more is required. Organizations that simply comply with the minimum standards set by the regulations are not in a good position to identify emerging safety problems.

1.5.4.2 An effective way to promote a safe operation is to ensure development of a positive safety culture. Simply put, all staff must be responsible for, and consider the impact of, safety on everything they do. This way of thinking must be so deep-rooted that it truly becomes a "culture". All decisions (for example, whether by the Board of Directors, by a driver on the ramp, or by an AME) need to consider the implications on safety.

1.5.4.3 A positive safety culture must be generated from the "**top down".** It relies on a high degree of trust and respect between workers and management. Workers must believe that they will be supported in any decisions made in the interests of safety. They must also understand that intentional breaches of safety that jeopardize operations will not be tolerated.

1.5.5 Indications of a positive safety culture

A positive safety culture demonstrates the following attributes:

- Senior management places strong emphasis on safety as part of the strategy of controlling risks (i.e. minimizing losses).
- Decision-makers and operational personnel hold a realistic view of the short- and long-term hazards involved in the organization's activities.
- Those in senior positions:
- – Foster a climate in which there is a positive attitude towards criticisms, comments and feedback
- – From lower levels of the organization on safety matters;
- – do not use their influence to force their views on subordinates; and
- – Implement measures to contain the consequences of identified safety deficiencies.
- Senior management promotes a **non-punitive** working environment. The term non-punitive does not imply blanket immunity.
- There is an awareness of the importance of communicating relevant safety information at all levels of the organization (both within and with outside entities).
- There are realistic and workable rules relating to hazards, safety and potential sources of damage.
- Personnel are well trained and understand the consequences of unsafe acts.
- There is a low incidence of risk-taking behavior, and a safety ethic that discourages such behavior.

1.5.6 Positive safety cultures typically are:

- **Informed cultures**. Management fosters a culture where people understand the hazards and risks inherent in their areas of operation. Personnel are provided with the necessary knowledge, skills and job experience to work safely, and they are encouraged to identify the threats to their safety and to seek the changes necessary to overcome them.
- **Learning cultures**. Learning is seen as more than a requirement for initial skills training; rather it is valued as a lifetime process. People are encouraged to develop and apply their own skills and knowledge to enhance organizational safety. Staff are updated on safety issues by

management, and safety reports are fed back to staff so that everyone can learn the pertinent safety lessons.

- **Reporting cultures**. Managers and operational personnel freely share critical safety information without the threat of punitive action. This is frequently referred to as creating a corporate reporting culture. Personnel are able to report hazards or safety concerns as they become aware of them, without fear of sanction or embarrassment.
- **Just cultures**. While a non-punitive environment is fundamental for a good reporting culture, the workforce must know and agree on what is acceptable and what is unacceptable behavior. Negligence or deliberate violations must not be tolerated by management (even in a non-punitive environment). A just culture recognizes that, in certain circumstances, there may be a need for punitive action and attempts to define the line between acceptable and unacceptable actions or activities.

The following table summarizes the main characteristics of safety culture for three different corporate responses to safety issues that range from a poor safety culture, through the indifferent (or bureaucratic) approach (which only meets minimum acceptable requirements), to the ideal positive safety culture.

Safety Culture: ⇨ ***Characteristics*** ⇩	***Poor***	***Bureaucratic***	***Positive***
Hazard information is:	Suppressed	Ignored	Actively sought
Safety messengers are:	Discouraged or punished	Tolerated	Trained and encouraged
Responsibility for safety is:	Avoided	Fragmented	Shared
Dissemination of safety information is:	Discouraged	Allowed but discouraged	Rewarded
Failures lead to:	Cover-ups	Local fixes	Inquiries and systemic reform
New ideas are:	Crushed	Considered as new problems (not opportunities)	Welcomed

1.5.7 Introduction to Safety Performance Indicators, Targets & Requirements.

i. In any system, it is necessary to set and measure performance outcomes in order to determine whether the system is operating in accordance with expectations and to identify where action may be required lo enhance performance levels to meet these expectations.

ii. The introduction of the concept of acceptable level of safety responds to the need to complement the prevailing approach to the management of safety based upon regulatory compliance, with a performance –based approach. The acceptable level of safety expresses the safety goals (or expectations) of an oversight authority and NESMA AIRLINES. From the perspective of the relationship between oversight authority and operators. It provides an objective in terms of the safety performance operators should achieve while conducting their core business function, as a minimum acceptable to the oversight authority. It is a reference against which the oversight authority can measure safety performance. In determining an acceptable level of safety, it is necessary to consider such factors as the level of risk that applies the cost /benefits of improvements to the system, and public expectations on the safety of the aviation industry.

iii. In practice, the concept of acceptable level of safety is expressed by two measures/metrics i.e. safety performance indicators and safety performance targets and implemented through various safety requirements. The following explains the use of these terms:

- **Safety Performance Indicators:** Is a measure of the safety performance of a department. Safety indicators should be easy to measure and be linked to the major components of a company's SMS.
- **Safety Performance Targets:** (sometimes referred to as goals or objectives) are determined by considering what, safety performance levels are desirable and realistic for individual departments and operators. Safety targets should be measurable, acceptable to stakeholders, and consistent with applied SMS.
- **Safety Requirements:** are needed to achieve the safety performance indicators and safety performance targets. They include the operational procedures. Technology, systems and programs to which measures of reliability, availability, performance and/or accuracy can be specified.

iv. The relationship between acceptable level of safety, safety performance indicators, safety performance targets and safety requirements is as follows;

- **Acceptable level of safety** is the overarching concept
- **Safety performance indicators** are the measures/metrics used to determine if the acceptable level of safety has been achieved.
- **Safety performance targets** are the quantified objectives pertinent to the acceptable level of safety
- **Safety requirements** are the tools or means required to achieved the safety targets

v. There will seldom be a national acceptable level of safety. More often, within each state there will be different acceptable levels of safety that will be agreed upon by the regulatory oversight authority and individuals

vi. Nesma Airlines will closely interact with the regulators and the management of each departmental head to define their safety performance indicators. He will set annual safety targets, appraise them regarding the Safety Requirements and periodic progress review towards achieving the agrees upon targets Regular reports to this effect would be submitted to the ECAA and Nesma Airlines management board. Additionally, all managers will be required to set at least one (personal safety target) in addition to their annual performance planning.

The achievement of this target shall be evaluated by the head of the safety committee as a part of the employees Performance Review. This assessment shall be taken into consideration for evaluating an employee's suitability for promotion and internal placements

1.5.8 Stakeholders in Safety

i. Given the total cost of aviation accidents, many divert groups have a stake in improving the management of safety. The principle stakeholders in safety are:

- Aviation professionals (e.g., flight crew, cabin crew, air traffic controllers and aircraft maintenance engineers AME)
- Aircraft owners and operators
- Aviation regulatory authorities (CAA)
- Manufacturers
- Industry trade associations (IATA)
- Regional ATS providers
- Professional associations and unions
- International aviation organization (ICAO)
- The flying public

ii. Major aviation safety occurrences invariably involve additional groups which may not always share a common objective in advancing aviation safety:

- Victims , or persons injured in an accidents
- Insurance companies
- Travel industry
- Safety training and educational institutions
- Other government departments and agencies
- Media
- General public, and
- Lawyers and consultants

1.5.9 Manual Purpose

i. The purpose of this manual is to assist all those who work at or work with Nesma Airlines in fulfilling its requirements with respect to implementation of SMS.

ii. Application of the guidance material herein is not limited to operation personnel. Rather, it is relevant to the full spectrum of stakeholders in safety including senior management.

iii. In particular , this manual is aimed at the personnel who are responsible for designing, implementing and managing effective safety activities ,namely:

- Nesma Airlines officials with responsibilities for regulating the aviation system
- Management of operational organization (subcontractors)
- Safety practitioners 7aueh as safety manager
- Users should find sufficient information herein for justification, initiation and operation of a viable SMS.

1.6 Emergency Response Plan

1.6.1 General Ref. to ERP Manual

i. According to Nesma airlines policy and objective, Nesma airlines issued an emergency response plan (ERP) for the central management and coordination of all activities if it is necessary to respond to a major aircraft accident or other type of adverse event that results in fatalities, serious injuries, considerable damage and/or a significant disruption of operations. the issued emergency response plan is considered an element of the SMS framework.

ii. The emergency (or crisis) response plan is prepared to be appropriate to deal with the risks related to Nesma airlines size and type of operations, and includes consideration of a major aircraft accident and other potential aircraft events that would require a full corporate emergency response.

iii. In Egypt, and in major cases of the emergency or crisis, the response is assumed by the governmental authority rather than by the operator (specially for small scale airlines). So the emergency response plan includes this consideration and addresses interaction with the governmental response to an emergency or crisis.

Nesma airlines ERP includes:

Specifies general conditions for implementation;
Provides a framework for an orderly implementation.
Ensures proper coordination with external entities at all potential locations.
Addresses all potential aspects of an event, including casualties;
Ensures regulatory requirements associated with specific events are satisfied;
Provides a scenario for the transition back to normal operations.
Ensures regular practice exercises as a means to achieve continual improvement

i. Emergency response planning may appear to have little to do with safety management. However, effective emergency response planning provides an opportunity to learn, as well as to apply, safety lessons aimed at minimizing damage or injury.

ii. To be able to respond successfully to an emergency, it is necessary to start with effective planning. An ERP provides the basis for a systematic approach to managing the organization's affairs in the aftermath of a significant unplanned event in the worst case, a major accident.

iii. Ref. to the Emergency Response Plan Manual for detail procedures.

1.6.2 The purpose of an ERP

The purpose of an ERP is to ensure that there is:

i. Orderly and efficient transition from normal to emergency operations;
ii. Delegation of emergency authority;
iii. Assignment of emergency responsibilities;
iv. Authorization by key personnel for actions contained in the plan;
v. Coordination of efforts to cope with the emergency; and
vi. Safe continuation of operations or return to normal operations as soon as possible.

1.6.3 An effective ERP

To be effective, an ERP should:

i. be relevant and useful to the people who are likely to be on duty at the time of an accident;
ii. include checklists and quick reference contact details of relevant personnel;
iii. be regularly tested through exercises; and
iv. be updated when changes occur.
v. Provides for:
   a. A transition from normal to emergency operations;
   b. A return to normal operations;
   c. Coordination with all external organizations during the course of ERP execution

1.6.4 ERP contents

The ERP documented in the format of a manual. It includes the responsibilities, a designated manager with appropriate qualifications and authority to manage and be responsible for the development, implementation and maintenance of the corporate ERP roles and actions for the various agencies and personnel involved in dealing with emergencies. An ERP should take into account such considerations as:

i. Governing policies. The ERP should provide direction for responding to emergencies, for example, governing laws and regulations for investigations, agreements with local authorities, and company policies and priorities.
ii. Organization. The ERP should outline management's intentions with respect to the responding organizations by:

- Designating who will be assigned to the response teams and specifying who will be the leader(s);
- Defining the roles and responsibilities for personnel assigned to the response teams;
- Clarifying the reporting lines of authority;
- Providing instructions for the setting up of a Crisis Management Centre (CMC);
- Establishing procedures for receiving a large number of requests for information, especially during the first few days after a major accident;
- Designating the corporate spokesperson for dealing with the media;
- Defining what resources will be available, including financial authorities for immediate activities;
- Designating the company representative with respect to any formal investigations undertaken by State officials; and
- Defining a call-out plan for key personnel.

- An organization chart or flow chart could be used to show organizational functions and communication relationships.

i. Notifications. The ERP should specify who in the organization should be notified of an emergency, and who will make external notifications and by what means. The notification needs of those listed below should be considered:

- Management;
- State authorities (Search and Rescue, regulatory authority, accident investigation board, etc.);
- Local emergency response services (airport authorities, firefighters, police, ambulance services, medical agencies, etc.);
- Relatives of victims (a sensitive issue that is handled by the police);
- Company personnel;
- the media; and
- Legal, accounting and insurance representatives.

i. Initial response. Depending on the circumstances, an initial response team may be dispatched to the accident site to augment local resources and oversee the organization's interests. Some factors to be considered for an initial response team are listed below:

ii. Crises Management Centre (CMC). Should be established at the organization's headquarters once the activation criteria have been met. In addition, a command post (CP) may be established at or near the accident site. The ERP should address how the following requirements are to be met:

- Staffing (perhaps for 24 hours a day, 7 days per week during the initial response period);
- Communications equipment (telephones, fax, Internet, etc.);
- Maintenance of emergency activity logs;
- Impounding of company records that are relevant to the emergency;
- Office furnishings and supplies; and
- Reference documents (such as emergency response checklists and procedures, company manuals, AEPs and telephone lists).
- The services of a crisis centre may need to be contracted out from an airline or other specialist organization to look after the operator's interests in a crisis away from home base. Company personnel would normally supplement the contracted centre as soon as possible.

iv. Records. In addition to the need to maintain logs of events and activities, the organization will be required to provide information to a State investigation team. The ERP should allow for the following types of information to be available to investigators.

- All relevant records on the aircraft, the flight crew, the operation, etc.;
- Lists of points of contact and any personnel associated with the occurrence;
- Notes of interviews with, and statements by, anyone associated with the event; and
- Photographic or other evidence.

v. Accident site. After a major accident, representatives from many jurisdictions have legitimate reasons for accessing the site, for example, police, firefighters, medics, airport authorities, coroners, State accident investigators, relief agencies (e.g. the Red Cross) and the media. Although coordination of the activities of these stakeholders is the responsibility of the State's police and/or investigating authority, Nesma airlines ERP clarify the following aspects of activity at the accident site:

- Nomination of a senior company representative at the accident site (wherever the accident occurs);
- Management of surviving passengers;
- Responding to the needs of the victims' relatives;
- Provision of security of wreckage;
- handling of human remains and personal property of the deceased;
- Preservation of evidence;
- Provision of assistance (as required) to the investigation authorities; and
- Removal and disposal of wreckage.

vi. News media. How the company responds to the media in coordination with the authorities may affect how well the company recovers from the event. Clear instructions are required with respect to such matters as:

- What information is protected by statute (Flight Data Recorder (FDR) data, Cockpit Voice Recorder (CVR) and ATC recordings, witness statements, etc.);
- Chief Executive Officer speak on behalf of the organization at head office and at the accident site if required.
- direction regarding a prepared statement for immediate response to media queries;
- what information may or may not be released;
- The timing and content of the company's initial statement; and provisions for regular updates to the media.

vii. Formal investigations. Guidance for company personnel dealing with State accident investigators and police should be provided in the ERP.

viii. Family assistance. The ERP should also include guidance on the organization's approach to assisting the families of accident victims (crew and passengers). This guidance may cover such matters as

- State requirements for the provision of family assistance services;
- Travel and accommodation arrangements to visit the accident location and survivors;
- Assignment of a programme coordinator and point(s) of contact for each family;
- Provision of up-to-date information;
- Grief counseling;
- Immediate financial assistance to victims and their families; and
- Memorial services. Some States define the types of assistance to be provided by an operator.

ix. Post-occurrence review. Direction should be provided to ensure that following the emergency key personnel carry out a full debriefing and record all significant lessons learned. This may result in amendments being made to the ERP and associated checklists.

1.6.5 ERP Implementation and Responsibilities

NESMA AIRLINES ERP should be coordinated so that all personnel know what response is required. As part of the emergency response planning, Nesma Airlines in conjunction with the airport operator is:

i. provide training to prepare personnel for emergencies;
ii. make arrangements to handle incoming telephone queries concerning the emergency;
iii. provide a description of duties for company personnel (e.g. person in command, and receptionists for receiving passengers in holding areas);
iv. gather essential information on passengers and coordinate fulfillment of their needs;
v. develop arrangements with other operators and agencies for the provision of mutual support during the emergency; and
vi. prepare and maintain an emergency kit containing:
   - Necessary administrative supplies (forms, paper, name tags, computers, etc.);
   - Critical telephone numbers (of doctors, local hotels, linguists, caterers, airline transport companies, etc.).

1.6.6 Aircraft accident ERP

In the event of an aircraft accident at or near the airport, an aircraft operator will be expected to take certain actions, for example:

i. Report to airport command post to coordinate the aircraft operator’s activities;
ii. Assist in the location and recovery of any flight recorders;
iii. Assist investigators with the identification of aircraft components and ensure that hazardous components are made safe;
iv. Provide information regarding passengers, flight crew and the existence of any dangerous goods onboard;
v. Transport uninjured persons to the designated holding area;

vi. Make arrangements for any uninjured persons who may intend to continue their journey or who

vii. Need accommodation or other assistance;

viii. Release information to the media in coordination with the airport public information officer and police; and

ix. Remove the aircraft and/or wreckage upon the authorization of the investigation authority.

1.6.7 Checklists

Everyone involved in the initial response to a major aircraft accident will experience some degree of shock. Therefore, the emergency response process lends itself to the use of checklists. These checklists form an integral part of the company's Operations or ERP Manual. To be effective, checklists must be regularly:

i. Reviewed and updated (for example, call-out lists and contact details); and

ii. Tested through realistic exercises.

1.6.8 Exercises

a. Notification Exercises (Rehearsals)

To check the response of the team personnel to arrive the crises management Center after notification. Of emergency situation.

b. Tabletop Exercises (Rehearsals)

To ensure everyone has been properly briefed.

Ensure everyone aware about his duties responsibilities and reviewing his Checklist

c. Simulation Exercises (Rehearsals)

– Reporting.

– -Activation of Emergency Response Center (ERC).

– -Application of the check lists of home base team

d. Debriefing:

A. Do it immediately after an actual event or an exercise (rehearsal).

B. Capture the lessons learned.

C. Write a report and distribute to regulatory authorities, corporate management, and operational personnel to identify deficiencies discovered during the event or drill & recommending corrective and / or preventative action.

D. The Emergency Response management shall follow up that the recommendations made following emergencies and drill are properly considered and addressed.

1.7 SMS Implementation Plan

1.7.1 General:

i. NESMA AIRLINES ensures that SMS implementation plan is prepared, reviewed and updated periodically under the responsibility of the safety and quality director who will be in full coordination with the accountable executive to

- Provide the needed resources for the plan
- Assess in creating appropriate safety culture.
- Ensure that the realistic strategy of implementing SMS will meet Nesma airlines safety requirements
- The plan approaches will manage safety.

ii. The plan will include:

- Development of a realistic strategy for the implementation of an SMS that will meet the organization's safety needs;
- Define an approach the organization will adopt for managing safety;
- Develop a safety policy;
- Develop objectives and goals;
- System description;
- Conduct a Gap Analysis;
- Develop SMS components;
- Identify roles and responsibilities;
- Develop a non-punitive safety reporting policy;
- Develop means of employee involvement;
- Develop safety communication; and
- Develop safety performance measurement.

iii. The senior management shall endorse the SMS implementation plan and review the safety performance.

1.7.2 SMS Implementation Phases:

SMS implementation encompasses four phases:

i. **Phase 1** provides a blueprint on how the SMS requirements will be met and integrated to the organization's work activities, and an accountability framework for the implementation of the SMS as follows:

- Identify the accountable executive and the safety accountabilities of managers;
- Identify the person (or planning group) within the organization responsible for implementing the SMS;
- Describe the system of operation (Air operator and or approved maintenance organization)
- Conduct a gap analysis of the organization's existing resources compared with the national and international requirements for establishing an SMS.

- Develop an SMS implementation plan that explains how the organization will implement the SMS on the basis of national requirements and international SARPs, the system description and the results of the gap analysis;
- Develop documentation relevant to safety policy and objectives; and
- Develop and establish means for safety communication.

ii. **Phase 2** should put into practice those elements of the SMS implementation plan that refer to the safety risk management reactive processes:

- Investigation and analysis;
- Hazard identification and risk management;
- Training relevant to:
  – SMS implementation plan components; and
  – Safety risk management (reactive processes).
- Documentation relevant to:
  – SMS implementation plan components; and
  – Safety risk management (reactive processes).

iii. **Phase 3** should put into practice those elements of the SMS implementation plan that refer to the safety risk management proactive processes:

- Investigation and analysis;
- Hazard identification and risk management;
- Training relevant to:
  – SMS implementation plan components; and
  – Safety risk management (proactive processes).
- Documentation relevant to:
  – SMS implementation plan components; and
  – Safety risk management (proactive processes).

iv. **Phase 4** should put into practice operational safety assurance:

- Development of acceptable level (s) of safety;
- Development of safety indicators and targets;
- SMS continuous improvement;
- Training relevant to operational safety assurance; and
- Documentation relevant to operational safety assurance.

1.8 Documentation and Record Control

1.8.1 Control of Documents (Reference to corporate manual chapter 2)

- The purpose of safety documents control is to ensure that the necessary, accurate and up-to-date safety documents are available to those who need them to include, in case of outsourced operational functions, employees of external service providers.
- NESMA Airlines is committed to maintain and implement controls on safety documents and SMS manual.
- Controlling our safety documentation will ensure that all staff have the right safety information available to them at all times allowing them to perform their role to its full extent, thus facilitating a smooth and compliant safety requirement for operations.
- The importance of reference documentation, data and the control of this information is vital to the smooth, safe operation at NESMA Airlines and the maintenance of regulatory compliance.
- All safety information whether received or issued internally or externally which has an impact on safe operations and the airworthiness of NESMA Airlines aircraft will be accurately documented and are readily available for all relevant staff to refer to.

1.8.2 SMS Record System (Reference to Corporate Manual chapter 2.2)

- Nesma Airlines have an effective system of SMS records management that substantiate the ongoing operation of the company SMS.
- The system addresses the management and control of all safety records associated with operations, which includes safety reporting records, personnel training records, and also includes any other records that document the fulfillment of safety implementations for operational requirements (e.g. aircraft maintenance, operational control…)
- The SMS records are managed and controlled by the safety and quality department.
- The SMS records are managed and controlled as a part of the centralized corporate record system.
- The SMS records are managed in such a way that ensures traceability, accessibility throughout the required retention period and in accordance with the regulatory requirements.

– SMS records retention table:

Record Name	Retention Period	Retention medium	Retained by
Hazards register (Hazard log)	Permanent	Digital Copy	Safety & Quality Department
Hazard/safety reports	5 years	Hard Copy	Safety & Quality Department
Safety performance indicators (SPIs) and related charts;	Permanent	Digital Copy	Safety & Quality Department
safety risk assessments	5 years	Hard Copy	Safety & Quality Department
SMS/Quality internal reviews or audits	5 years	Digital copy/Hard copy	Safety & Quality Department
SMS/safety training;	1 year after the employment Leave	Digital copy/Hard copy	Safety & Quality Department
SMS/safety committee meeting minutes.	5 years	Hard Copy	Safety & Quality Department
Flight safety reports	Permanent	Digital Copy	Safety & Quality Department
Accident reports	Permanent	Hard Copy	Safety & Quality Department and Chief Inspector office

Chapter (2)

Safety Hazard, Risk Management and Investigation

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Part (2) - Table of Content

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2.1 Hazard Identification and Safety Reporting Process

2.1.1 Hazard Identification

Nesma Airlines have a hazard identification program that is implemented and integrated throughout the organization, to include:

i. A combination of reactive and proactive methods for safety data collection;
ii. Processes for safety data analyses that identifies existing hazards and predict future hazards to aircraft operations.

To ensure all hazards are identified to the extent possible, hazard identification processes are necessarily formalized, coordinated and consistently applied on an on-going basis in all areas of the organization where there is a potential for hazards that could affect aircraft operations.

To be effective, reactive and proactive processes are used to acquire information and data, which are then analyzed to identify existing or predict future (i.e. potential) hazards to aircraft operations. Nesma airlines has developed and maintains a formal process for collecting, recording, acting on and generating feedback about hazards in operations, based on a combination of reactive, proactive and predictive methods of safety data Collection, Examples of processes that typically yield information or data for hazard identification include:

- Reporting system;
- Investigation of accidents, incidents, irregularities and other non-normal events;
- Flight data analysis (AIRFASE)
- Observation of flight crew performance in line operations and training;
- Quality assurance and/or safety auditing;
- Safety information gathering or exchange (external sources).

Processes are designed to identify hazards that might be associated with organizational business changes e.g. addition of new routes or destinations.

The strategy that NESMA AIRLINES adopts for its SMS will reflect its corporate safety culture and range from purely reactive, responding only to accidents, through to strategies that are highly proactive in their search for safety problems. Safety objectives shall be published and distributed.

2.1.1.1 Understanding hazards and consequences

A hazard is generically defined by a condition or an object with the potential to cause death, injuries to personnel, damage to equipment or structures, loss of material, or reduction of the ability to perform a prescribed function. For the purpose of aviation safety risk management, the term hazard should be focused on those conditions which could cause or contribute to unsafe operation of aircraft or aviation safety-related equipment, products and services mechanisms.

2.1.1.2 Hazard identification and prioritization

Hazards exist at all levels in the organization and are detectable through use of reporting systems, inspections or audits. Mishaps may occur when hazards interact with certain triggering factors. As a result, hazards should be identified before they lead to accidents, incidents or other safety-related occurrences. An important mechanism for proactive hazard identification is a voluntary hazard/incident reporting system.

Hazards can also be identified from the review or study of investigation reports, especially those hazards which are deemed to be indirect contributing factors and which may not have been adequately addressed by corrective actions resulting from the investigation process.

Hazards may be categorized according to their source or location. Objective prioritization of hazards may require categorizations according to the severity/likelihood of their projected consequences. This will facilitate the prioritization of risk mitigation strategies so as to use limited resources in the most effective manner.

a) Hazard prioritization procedure
   Hazards are Prioritize in relation to the risk index (severity and likelihood) category of the hazard's worst possible consequence.
b) Project the risk index number (based on the relevant severity and likelihood matrix) of the hazard's worst possible consequence (refer to Figure 2-13 of this chapter);
c) With reference to the related tolerability matrix, determine the risk index's tolerability category (i.e. intolerable, tolerable or acceptable);
d) Conclude that the hazard's prioritization is thus:

Projected risk index	Hazard level
Intolerable/High risk	Level 1
Tolerable/Moderate risk	Level 2
Acceptable/Low risk	Level 3

2.1.1.3 Hazard identification methodologies

The three methodologies for identifying hazards are shown in the left of the following figure

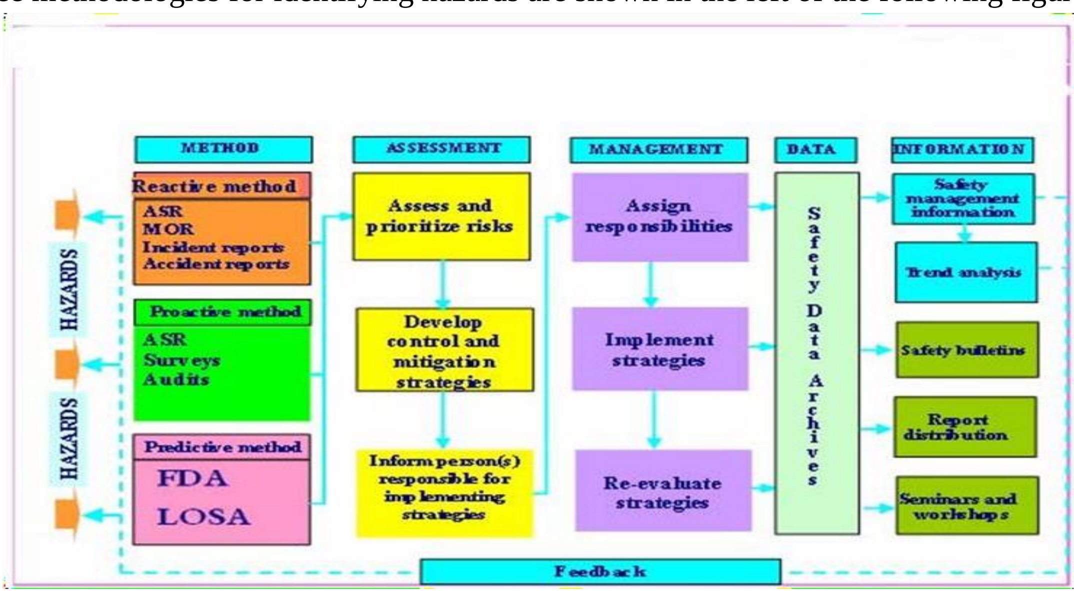


Figure 1 Safety Management System Process

2.1.1.3.1 Reactive safety method

- This methodology involves analysis of past outcomes or events. Hazards are identified through investigation of safety occurrences. Incidents and accidents are clear indicators of system deficiencies and therefore can be used to determine the hazards that either contributed to the event or are latent.

- The reactive approach tends to be marked by the following characteristics:

a) Management’s safety focus is on compliance with minimum requirements.

b) Safety measurement is based on reportable accidents and incidents with such limitations in value as:

  – Any analysis is limited to examining actual failures
  – Insufficient data is available to accurately determine trends, especially those attributable to human error.
  – Little insight is available into the “root causes” and latent unsafe conditions, which facilitate human error.

Constant “catching up” is required to match human inventiveness for new types of errors.

- The reactive safety method tools are may include but not limited to:

a) Accident/Incident reports

b) Air Safety reports

c) Cabin Crew Air safety reports

d) Mandatory Occurrence reports

e) Industry accident reports

f) State safety reporting systems;

2.1.1.1.3.2 Proactive safety method

- This methodology involves analysis of existing or real-time situations, which is the primary job of the safety assurance function with its audits, evaluations, employee reporting, and associated analysis and assessment processes. This involves actively seeking hazards in the existing processes.
- NESMA AIRLINES pursuing a proactive method for safety management believes that the risk of accidents can be minimized by identifying vulnerabilities before they fail and by taking the necessary actions to reduce those risks. Consequently, they actively seek systemic unsafe conditions using such tools as:

a) Hazard (voluntary and confidential hazards reports) and incident reporting systems that promotes the identification of latent unsafe conditions;

b) Safety surveys to elicit feedback from front-line personnel about areas of dissatisfaction and unsatisfactory conditions that may have accident potential;

c) Operational non-routine surveillance and/or audits of all aspects of operations to identify vulnerable areas before accidents, incidents or minor safety events confirm a problem exists

2.1.1.3.3 Predictive safety method

- This methodology involves data gathering in order to identify possible negative future outcomes or events, analyzing system processes and the environment to identify potential future hazards and initiating mitigating actions**.**
- The predictive safety method tools are

a) **Flight Data Analysis (FDA)** is a tool for identification of hazards, FDA program may be used for detecting exceedances or safety events, such as deviations from flight manual limits, all the data gathered in an FDA program shall be kept in a central safety database. (For further details concerning FDA Program refer to Part 5 Chapter 5.1) .

b) **LOSA** a tool for the understanding of human errors in flight operations. It is used to identify the threats to aviation safety that lead to human errors, to minimize the risks that such threats may generate and to implement measures to manage these errors within the operational context. LOSA enables Nesma Airlines to assess resistance to operational risks and errors by front-line personnel. Using data driven approach, they can prioritize these risks and identify actions to reduce the risk of accidents.

2.1.1.3.4 Hazard Records

In order to maintain knowledge of hazards and be able to refer to it, each department, records and maintains a list of the hazards it faces or may face in the “Departmental Hazard list”, to ensure the resilience of operations in all operating conditions and to communicate them to those working on the frontline.

The Safety & Quality Department manages this hazard log and the content of which is supplied by the individual department, through entering each department hazard list in the “Hazard Log”, each hazard will have a unique serial reflected on the hazard risk management sheet.

2.1.2 Safety Reporting System

2.1.2.1 Introduction

Every event is an opportunity to NESMA AIRLINES to learn valuable safety lessons. The lessons will only be understood, however, if the occurrence is analyzed so that all staff, including management, understands not only what happened, but also why it happened. This involves looking beyond the event and investigating the contributing factors.

To achieve this, NESMA AIRLINES maintains procedures for the internal reporting and recording of occurrences, hazards and other safety related issues. The collection of timely, appropriate and accurate data will allow NESMA AIRLINES to react to information received, and apply the necessary corrective action to prevent a recurrence of the event.

The key to accomplish this, NESMA AIRLINES have a reporting system that meets the needs of all staff that will be using it – all staff. As such, personnel input into the development of the system are vital. A safety reporting system is worthless if no one uses it.

NESMA AIRLINES non-punitive discipline policy and a real and demonstrated Commitment by management to achieve the company's safety goals will help to foster the development of a reporting culture within NESMA AIRLINES.

2.1.2.2 Objective

One of the main SMS objective in Nesma Airlines is to have a safety reporting system that is implemented throughout the organization in a manner that:

i) Encourages and facilitates personnel to submit reports that identify safety hazards, expose safety deficiencies and raise safety concerns;

ii) Ensures mandatory reporting in accordance with applicable regulations;

iii) Includes analysis and management action as necessary to address safety issues identified through the reporting system.

Safety reporting is considered a proactive and a reactive hazard identification activity in an SMS. Frontline personnel, such as flight or cabin crew members and maintenance technicians, are exposed to hazards and face challenging situations as part of their everyday activities. An operational reporting system provides such personnel with a means to report these hazards or any other safety concerns so they may be brought to the attention of relevant managers.

To build confidence in the reporting process and encourage more reporting, an acknowledgement of receipt is typically provided to each person that submits a report. An effective system provides for a review and analysis of each report to determine whether a real safety issue exists, and if so, ensure development and implementation of appropriate action by responsible management to correct the situation.

2.1.2.3 Hazards reporting, events or safety concerns

NESMA AIRLINES has developed Hazards, Events and safety concerns forms to allow for a full description of the event.

i. Why report?

All events require appropriate investigation in order to:

a) Establish their root cause, that is the underlying initial contributing factor(s) that caused the event, and identify actions to minimize the chance of recurrence;

b) Satisfy any regulatory requirements for reporting and investigation as ECAR 39 (MOR)
c) Provide a factual record of the circumstances of the event or hazard to allow others to learn from the situation; and
d) Categorize the underlying causes and establish the appropriate remedial and continuous improvement action.

ii. What should be reported?

Any event or hazard with the potential to cause damage or injury should be reported.
Examples of these issues are:

a) Excessive duty times
b) Crews rushing through checks
c) Inadequate tool or equipment control
d) Unruly passengers
e) Emergency exit paths blocked
f) Incorrect or inadequate procedures and a failure to adhere to standard procedures.
g) Poor communication between operational areas
h) Lack of up to date technical manuals
i) Poor shift changeovers
j) Runway incursions
k) Lack of adequate training and recurrent training.

iii. When should a hazard report be submitted?

Any individual involved directly or indirectly in the flight activities of the flight department (i.e. cockpit, cabin, dispatchers, maintenance, employees, personnel, and others providing aviation related. products/services) must report any observed hazard. If a hazard is recognized and unable to be observed via normal procedures, the observer shall complete a hazard report and submit it to the Safety manager.

A Hazard Report or Flight Operations Incident Report shall be submitted when any situation, practice, procedure, or process is observed which either a recognized safety concern is, Considered unusual from an operational or procedural standpoint, or Considered deficient from a safety standpoint, and which, in the submitter's opinion, possesses a foreseeable potential for injury or illness to persons or damage or loss of property if not addressed in a timely manner.

Any safety concern that would be of interest to others that are involved in like activities should be reported.

Hazard Report is not required for hazards which are able to be resolved locally, however, when a hazard is likely to be duplicated in other department workplaces a Hazard Report should be submitted for the benefit of other affected employees

iv. How a Hazard shall be reported?

The hazard should be reported using the following forms:

1. Air Safety Report (ASR) (Form No. 305)
2. Confidential / Hazard / Human Factor Report (Form No. 302)
3. Voluntary Report (Form No. 303)
4. Cabin Crew Safety Report (Form No. 304)

NESMA AIRLINES's reporting system maintains confidentiality between the person reporting the hazard and the Safety and Quality Director /Flight Safety Manager. Any safety information distributed a hazard report must be de- identified.

v. Hazard reporting processing

- All safety reports shall be submitted to the Safety and Quality Department;
- Upon receipt of a Hazard Report the Safety and Quality Director will conduct an investigation to determine the validity of the report as well as to gain additional information concerning the report's subject matter. Any hazardous situations or equipment shall be either placarded or removed from service until the hazardous situation is corrected. The submitter, if identified, will be advised of the result of the investigation. If a Hazard Report identifies a problem that is outside the scope or authority, the originator will be offered assistance in routing the information to the appropriate person responsible.
- Upon validation of a Hazard Report, the Safety & Quality Director shall identify and notify the individual(s) assigned responsibility for the affected workplace(s). The contents of the Hazard Report and the investigation results will be provided along with recommendations for corrective/preventive action. Appropriate action and a target date for elimination or reduction of the hazardous situation will then be determined.
- Final corrective action shall be documented on the Hazard Report form and the completed form returned to the Safety & Quality Director. The Hazard Report originator will then be notified through a personal contact by the Safety & Quality Director of the final disposition of the matter.
- Nesma airlines decisions concerning risk acceptability should be made by management and they should be kept informed of all high-risk considerations. Hazards that were not adequately disposition should be communicated to management for resolution.

- Safety and Quality Director is responsible for investigation of the report and for the confidentiality of the report. Anyone submitting a safety report must receive acknowledgement and feedback within 10 working days after the investigation. The de-identified safety report and recommendations should be made widely available for the benefit of all staff.

vi. Hazard reports dissemination

Reports should be distributed, as a minimum, to the following:

a) The Safety and Quality Director for managing the safety management system.
b) The safety committee.
c) The originator of the report must receive acknowledgement and feedback.

2.1.2.4 Hazard, Confidential Human Factors reporting system

Nesma Airlines have a confidential safety reporting system that is implemented throughout the organization in a manner that encourages and facilitates the reporting of events, hazards and/or concerns resulting from or associated with human performance in operations.

Nesma Airline have a non-punitive reporting policy assures employees that the reporting of unintentional errors does not result in disciplinary or punitive action being taken against the reporter or other individuals involved unless such errors result from illegal activity, willful misconduct or other egregious actions.

vii. Hazard, Confidential Human Factors reporting process

- Hazard Reports should be submitted using the Hazard Confidential / human factors Report form.
- The submitter's identification on the report is optional but is encouraged in the event that further information is required for elimination of the hazard.
- Reports should be concise and should accurately and thoroughly describe the hazard. When applicable, reports should include the submitter's recommendation(s) for corrective action.
- In circumstances where the perceived hazard possesses the immediate potential for injury/illness to persons or damage/loss of property, management shall be notified immediately by the most expeditious means possible for the purpose of determining appropriate action to prevent such injury/illness or damage/loss.

Confidential Reporting systems aim to protect the identity of the reporter. This is one way of ensuring that voluntary reporting systems are non-punitive as per Nesma airline non-punitive policy. Confidentiality is usually achieved by de-identification, and any information about the reporter is known only to" Safety & Quality directory" in order to allow for the follow-up of the reported event(s). Confidential incident reporting systems facilitate the disclosure of hazards leading to human error **2.1.3 Voluntary Reporting system: (form no. 303)**

This reporting is voluntary in nature which means it is submitted without any administrative requirement.

NESMA AIRLINES the top management encourages all employees and gives them the incentive to report voluntarily any hazard or Event. (Reporting Underlining Errors or Unintentional Violations) .In NESMA AIRLINES The reported information shall not be used against the reporter, The Voluntary Reporting system is non-punitive and extend protection to the source of information to encourage the reporting of such valuable information.

2.1.4 Cabin Safety Program (form no. 304)

NESMA AIRLINES's Cabin safety is aimed to minimizing risks to the occupants of the aircraft. By reducing or eliminating hazards with the potential for creating injuries or causing damage, the range of threats to the aircraft and its occupants include:

a. In-flight turbulence;
b. Smoke or fire in the cabin
c. Decompression;
d. Emergency landings;
e. Emergency evacuations
f. Unruly passengers.

Cabin crews are providing assistance to passengers during an emergency. Following a major aviation accident, investigative attention will likely focus initially on flight operations as guided by the evidence. For example:

a. Incorrect loading of passengers (e.g. weight and balance considerations)
b. Failure to properly secure the cabin and galleys for take-off, landing and in turbulence
c. Delayed reaction to warnings (e.g.in-flight turbulence)
d. Inappropriate response to events in the cabin (e.g. electrical short-circuits, smoke, fumes, oven fire)
e. Failure to report significant observations (e.g. fluid leaks, wings contaminated by ice) to the flight crew.

2.1.4.1 Procedures include, but are not limited to the following:

Passenger boarding; seat assignment; stowage of carry-on baggage; emergency exit accessibility and availability; passenger safety briefing; service equipment storage and use; emergency medical equipment storage and use (oxygen, first aid kit, etc.); handling of medical emergencies; non- medical emergency equipment storage and use (fire extinguishers, protective breathing equipment, etc.)

2.1.4.2In-flight emergency procedures

(Smoke, fire, etc.); cabin crew announcements; turbulence procedures (including securing the cabin); handling unruly passengers; emergency evacuations; and routine deplaning.

2.1.4.3 Hazard and incident reporting

Cabin crew must be able to report hazards, incidents and safety concerns as they become aware of them without fear of embarrassment, incrimination or disciplinary action. Cabin crew, their supervisors and the Safety &Quality Manager should have no doubts about:

a. The types of hazards that should be reported;
b. The appropriate reporting mechanisms;
c. Their job security (following the reporting of a safety concern); and
d. Any safety actions taken to follow-up on identified hazards.

2.1.5 Safety oversight

Safety oversight for cabin safety shall achieve by program of:

a. Aircraft inspections (e.g. emergency exits, emergency equipment, galleys);
b. Pre-flight (ramp) inspections;
c. In-flight cabin inspections (e.g. passenger briefings, crew briefings and use of checklists)

NESMA AIRLINES internal safety audit program should include the cabin crew department. The audit process should include a review of all cabin operations as well as an audit of cabin safety procedures, training, cabin crew's operating manual, etc.

2.1.6 Safety reporting culture

Use of the following outlined principles helps to overcome the natural resistance to safety reporting & improves Safety reporting culture at NESMA AIRLINES:

2.1.6.1 Trust

Persons reporting hazards or incidents must trust that the receiving organization the company will not use the information against them in any way. Without such confidence, people will be reluctant to report their mistakes or other hazards they have noticed.

Trust begins with the design and implementation of the reporting system. Employee input into the development of a reporting system is therefore vital.

NESMA AIRLINES believes that positive safety culture in the organization generates such kind of trust necessary for a successful incident reporting system. Specifically, the culture must be error-tolerant and just. In addition, incident-reporting systems need to be perceived as being fair in how they treat unintentional errors or mistakes. (Most people do not expect an incident reporting system exempt criminal acts or deliberate violations from prosecution or disciplinary action.) NESMA AIRLINES considers such a process to be an example of a "just culture".

2.1.6.2 Non-punitive

Non-punitive reporting systems are based on confidentiality. Before employees will freely report incidents, At NESMA AIRLINES Top management committed that reported information would not be used punitively against them. The person reporting the incident (or unsafe condition) must be confident that anything said will be kept in confidence.

Reporting anonymously is not the same as confidential reporting. Most successful reporting systems have some type of call-back capability in order to confirm details or obtain a better understanding of the occurrence. Reporting anonymously makes it impossible to "call back" to ensure understanding and completeness of the information provided by the reporter. There is also a danger that anonymous reporting may be used for purposes other than safety.

2.1.6.3 Inclusive reporting base

Early voluntary incident reporting systems were targeted at flight crew. Pilots are in a position to observe a broad spectrum of the aviation system and are therefore able to comment on the system's health. Nonetheless, incident reporting systems that focus solely on the perspective of flight crew tends to reinforce the idea that everything comes down to pilot error. Taking a systemic approach to safety management requires that safety information be obtained from all parts of the operation.

Incidents reporting systems, collecting information on the same occurrence from different perspectives facilitates forms a more complete impression of events. Relying on only one perspective; may not provide a complete understanding of the event.

2.1.6.4 Independence

Voluntary reporting to the Quality & Safety Director benefits from a trusted "third party" managing the system. Quality & Safety Director receives, processes and analyses the incident reports and feeds the results back to the safety committee, and any information received will be used for safety purposes only; as part of NESMA AIRLINES safety management system.

2.1.6.5 Ease of reporting

The task of submitting incident reports should be as easy as possible for the reporter. Reporting forms should be readily available so that anyone wishing to fill a report can do so easily. Forms should be simple to compile, have adequate space for a descriptive narrative and should encourage suggestions on how to improve the situation or prevent a reoccurrence. To simplify completion, classifying information, such as the type of operation, light conditions, type of flight plan, and weather, can use a "tick-off" format.

2.1.6.6 Acknowledgment

The reporting of incidents requires time and effort by the reporter and should be appropriately acknowledged. To encourage further submission of reports, one State encloses a blank report form with its acknowledgment letter. In addition, the reporter naturally expects feedback about actions taken in response to the reported safety concern.

2.1.6.7 Promotion

The (de-identified) information received from an incident reporting system should be made available for all employees in a timely manner. This could be done in the form of monthly newsletters or periodic summaries. Ideally, a variety of methods would be used with a view to achieving maximum exposure. Such promotional activities may help to motivate people to report additional incidents.

2.1.7 Types of incident reporting systems

In general, an incident involves an unsafe, or potentially unsafe, occurrence or condition that does not involve serious personal injury or significant property damage, i.e. it does not meet the criteria for an accident. Even though; NESMA AIRLINES is required – as an operator to report the occurrence to ECAA.

2.1.7.1 Mandatory incident reporting systems

In a mandatory system, NESMA AIRLINES is required to report certain types of incidents. This necessitates detailed procedures outlining who shall report and what shall be reported. The number of variables in aviation operations is so great that it is difficult to provide a comprehensive list of items or conditions which should be reported. However, the rule should be: “If in doubt – report it.”

Since mandatory systems deal mainly with “hardware” matters, they tend to collect more information on technical failures than on the human performance aspects. To help overcome this problem, NESMA AIRLINES developed voluntary incident reporting systems that aimed at acquiring more information on the Human Factors aspects of occurrences.

Following is a listing of the types of occurrences or safety events to be reported to ECAA under the company’s incident reporting system. The list is neither exhaustive nor in any order of importance:

- Any system defect which adversely affects the handling or operation of the aircraft;
- Warning of smoke or fire, the activation of toilet smoke detectors or galley fires
- An emergency is declared;
- The aircraft is evacuated by means of the emergency exits/slides;
- Safety equipment or procedures are defective, inadequate or used;
- Serious deficiencies in operational documentation;
- Incorrect loading of fuel, cargo or dangerous goods;
- Significant deviation from SOPs;
- An engine is shut down or fails at any stage of the flight;
- Ground damage occurs;
- A take-off is rejected after take-off power is established;

- The aircraft leaves the runway or taxiway or other hard standing;
- A navigation error involving a significant deviation from track;
- An altitude excursion of more than 500 ft occurs;
- Un-stabilized approach under 500 ft;
- Exceeding the limiting parameters for the aircraft configuration;
- Communications fail or are impaired;
- A stall warning occurs;
- GPWS activation;
- A heavy landing check is required;
- Hazardous surface conditions, e.g. icy, slush and poor braking;
- Aircraft lands with reserve fuel or less remaining;
- A TCAS RA event;
- A serious ATC incident, e.g. near mid-air collision, runway incursion and incorrect
- Clearance;
- Significant wake turbulence, turbulence, wind shear or other severe weather;
- Crew or passengers become seriously ill, are injured, become incapacitated or deceased;
- Violent, armed or intoxicated passengers, or when restraint is necessary;
- Security procedures are breached;
- Bird strike or Foreign Object Damage (FOD); and
- Any other event considered likely to have an effect on safety or aircraft operations

2.2 Safety Risk Assessment and Mitigation Process

2.2.1 Risk Management.

Not all risks can be eliminated, nor are all-believable risk mitigation measures economically feasible. The risks and costs inherent in aviation necessitate a rational process for decision-making. Daily, decisions are made in real time, weighing the probability and severity of any adverse consequences implied by the risk against the expected gain of taking the risk.

This process is known as “Risk management". As shown in figure1

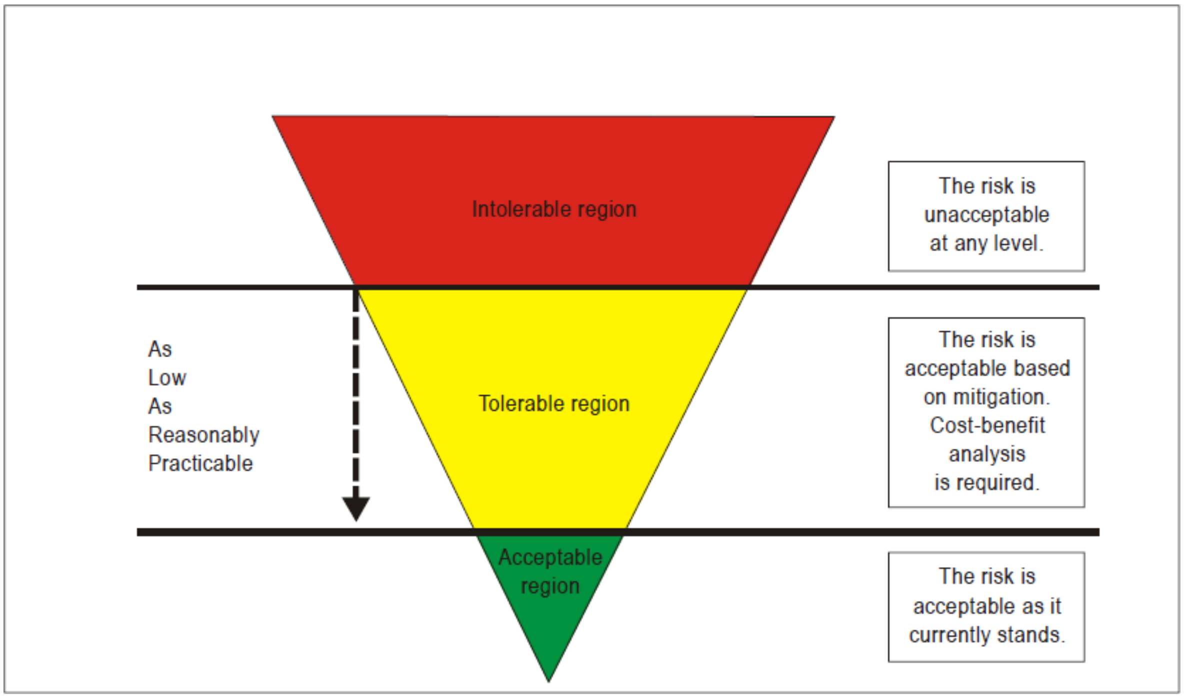


Figure 1 Risk management

Risk management facilitates the balancing act between assessed risks and viable risk mitigation. Risk management is an integral component of safety management. It involves a logical Process of objective analysis, particularly in the evaluation of the risks. The process for risk management is summarized in the flow chart in Figure 2 as the figure indicates; risk management comprises three essential elements: hazard identification, risk assessment and risk mitigation. The concepts of risk management have equal application in decision-making.

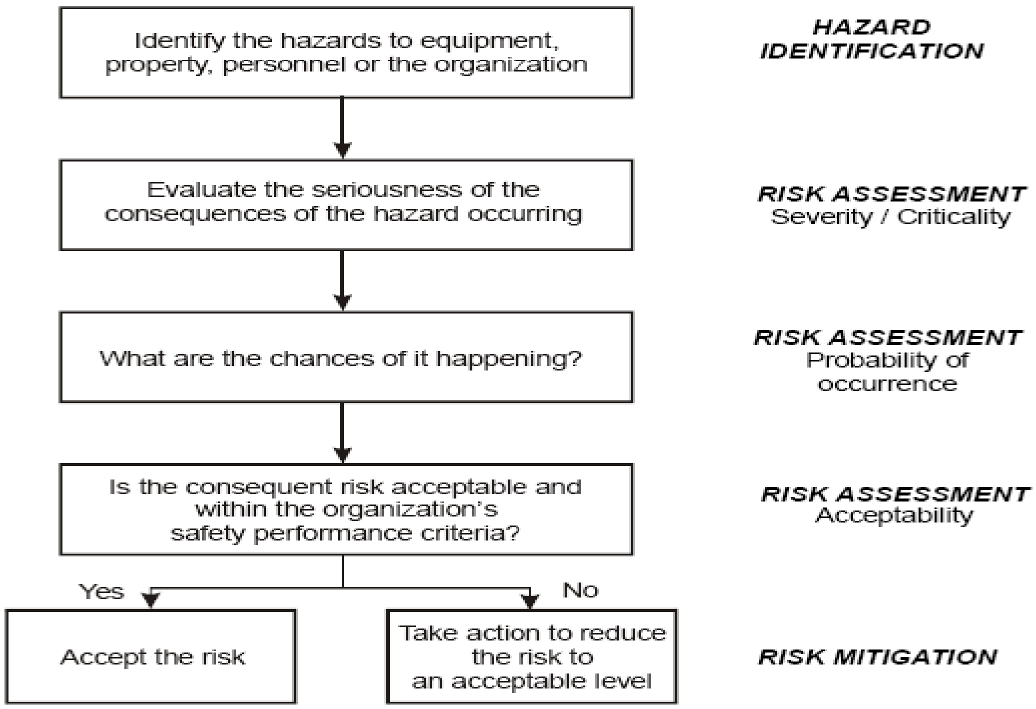


Figure 2 Risk management process

2.2.2 First fundamental – Risk management

What is it the identification? Analysis and elimination or mitigation to an acceptable level of risks that threaten the capabilities of an organization.

What is the objective? Aims at a balanced allocation of resources to address all risks and viable risk control and mitigation.

Why is it important a key component of safety management systems? Data-driven approach to safety resources allocation thus defensible and easier to explain.

2.2.3 Second fundamental - Risk probability

Probability: The possibility that a situation of danger might occur as shown in figure 3

Questions for assessing the probability of an occurrence:

a. Is there a history of occurrences like the one being assessed, or is the occurrence an isolated event?

b. What other equipment, or similar type components, might have similar defects?
c. What number of operating or maintenance personnel must follow the procedure (s) in question?
d. How frequently is the equipment or procedure under assessment used?
e. Are there organizational, management or regulatory implications that might generate larger threats to public safety?

PROBABILITY OF OCCURRENCS		
RISK PROBABILITY	**MEANING**	**VALUE**
FREQUENT	**Likely to occur many times** (has already occurred in the company (Freq. > 3 x year). Has occurred frequently in the history of the aviation industry)	**5**
OCCASIONAL	**Likely to occur sometimes** (has already occurred in the company (Freq. < 3 x year). Has occurred infrequently in the history of the aviation industry)	**4**
REMOTE	**Unlikely to occur, but possible** (has already occurred in the company at least once. Has regularly occurred in the history of the aviation industry)	**3**
IMPROBABLE	**Very unlikely to occur** (not known to have occurred in the company but has already occurred at least once in the history of the aviation industry)	**2**
EXTREMELY IMPROBABLE	**Almost inconceivable that the event will occur** (it has never occurred in the history of the aviation industry)	**1**

Figure 3 Risk Probability

2.2.4 Third fundamental – Risk severity

Severity – The possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation. As shown in figure 4

Define the consequence(s) in terms of Property, Health, Finance, People and Environment.

Questions for assessing the severity of the consequences of an occurrence:

How many lives are at risk?

- Employees, Passengers and Bystanders

What is the likelihood of environmental impact?

- Spill of fuel or other hazardous product.

What is the likely extent of property or financial damage?

- Direct operator property loss
- Damage to aviation infrastructure

RISK SEVERITY OF OCCURRENCES					
SEVERITY OF OCCURRENCE	MEANING				VALUE
	PERSONNEL	ENVIRONMENT	MATERIAL	IMAGE	
CATASTROPHIC	Multiple fatalities	Massive effects (pollution, destruction, etc.)	Damage> 1 M$	International impact	**E**
HAZARDOUS	Fatality	Effects difficult to repair	Damage< 1 M$	National impact	**D**
MAJOR	Serious injuries	Noteworthy local effects	Damage< 250K$	Considerable impact	**C**
MINOR	Slight injuries	Little impact	Damage< 50K$	Limited impact	**B**
NEGLIGIBLE	Superficial or no injuries	Negligible or no effects	Damage < 10K$	Light or no impact	**A**

Figure 4 risk severity

2.2.5 Fourth fundamental risk assessment and tolerability

Using the risk analysis matrix as shown in figure 5, it is possible to standardize the qualitative risk assessments, and categorize the hazard using the tolerability NESMA AIRLINES considers important as shown in figure 6

RISK PROBABILITY	**RISK SEVERITY**				
	NEGLIGIBLE (A)	MINOR (B)	MAJOR (C)	HAZARDOUS (D)	CATASTROPHIC (E)
FREQUENT (5)	**5 A**	**5 B**	**5 C**	**5 D**	**5 E**
OCCASIONAL (4)	**4 A**	**4 B**	**4 C**	**4 D**	**4 E**
REMOTE (3)	**3 A**	**3 B**	**3 C**	**3 D**	**3 E**
IMPROBABLE (2)	**2 A**	**2 B**	**2 C**	**2 D**	**2 E**
EXTREMELY IMPROBABLE (1)	**1 A**	**1 B**	**1 C**	**1 D**	**1 E**

Figure 5-Risk Assessments Matrix

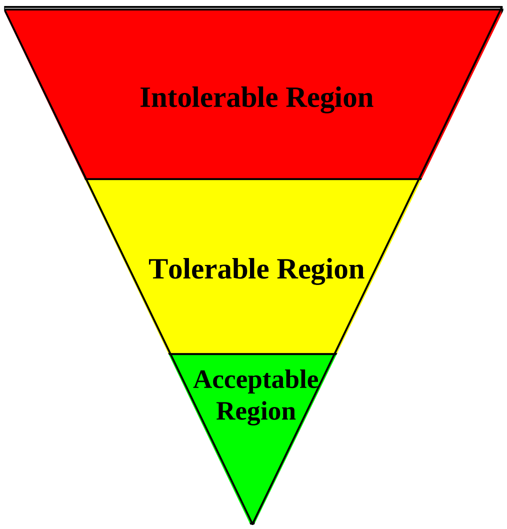
<table>
<tr><th>SUGGESTED CRITERIA</th><th>ASSESSMENT RISK INDEX</th><th>SUGGESTED CRITERIA</th></tr>
<tr><td rowspan="3">
</td><td>5 B, 5 C, 5 D, 5 E,
4 C, 4 D, 4 E,
3 D, 3 E</td><td>Unacceptable under the existing circumstances</td></tr>
<tr><td>5 A
4 B
3 C
2 D, 2 E</td><td>Acceptable based on risk mitigation. It may require management decision</td></tr>
<tr><td>3 A, 3 B
2 A, 2 B, 2 C
1 A, 1 B, 1 C, 1 D, 1 E</td><td>Acceptable</td></tr>
</table>

Figure 6 Risk Tolerability

2.2.6 Fifth fundamental – Risk control / mitigation

Mitigation*:* Measures to eliminate the potential hazard or to reduce the risk probability or severity.

Risk mitigation = Risk control

Mitigate to make milder, less severe or less harsh

Risk mitigation – Defences

As part of the risk mitigation, determine:

a. Do defences to protect against such risk (s) exist?
b. Do defences function as intended?
c. Are the defences practical for use under actual working conditions?
d. Are staffs involved aware of the risks and the defences in place?
e. Are additional risk mitigation measures required?

– Recalling the three basic defences
– Technology
– Training
– Regulation

Avoidance: The operation or activity is cancelled because risks exceed the benefits of continuing the operation or activity. e.g. Regular operations into an aerodrome surrounded by complex geography and without the necessary aids are cancelled.

Reduction: The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the accepted risks. e.g. Regular operations into an aerodrome surrounded by complex geography and without the necessary aids are continued based upon the availability of specific aids and application of specific procedures.

Segregation of exposure: Action is taken to isolate the effects of risks or build-in redundancy to protect against it, i.e., reduces the severity of risk.

Note: Figure 7 showing risk mitigation and Figure 8 showing risk mitigation process.

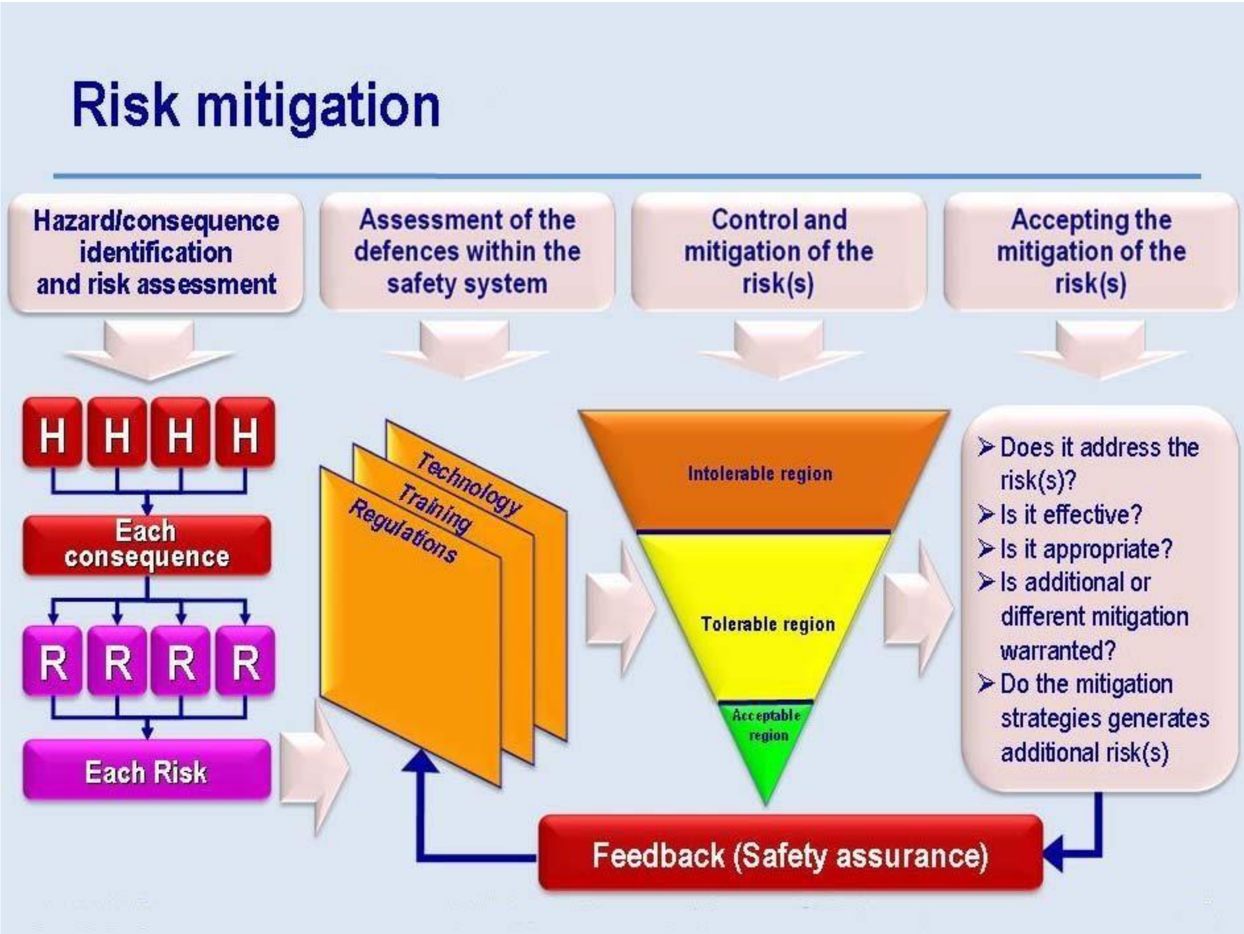


Figure 7 Risk Mitigation

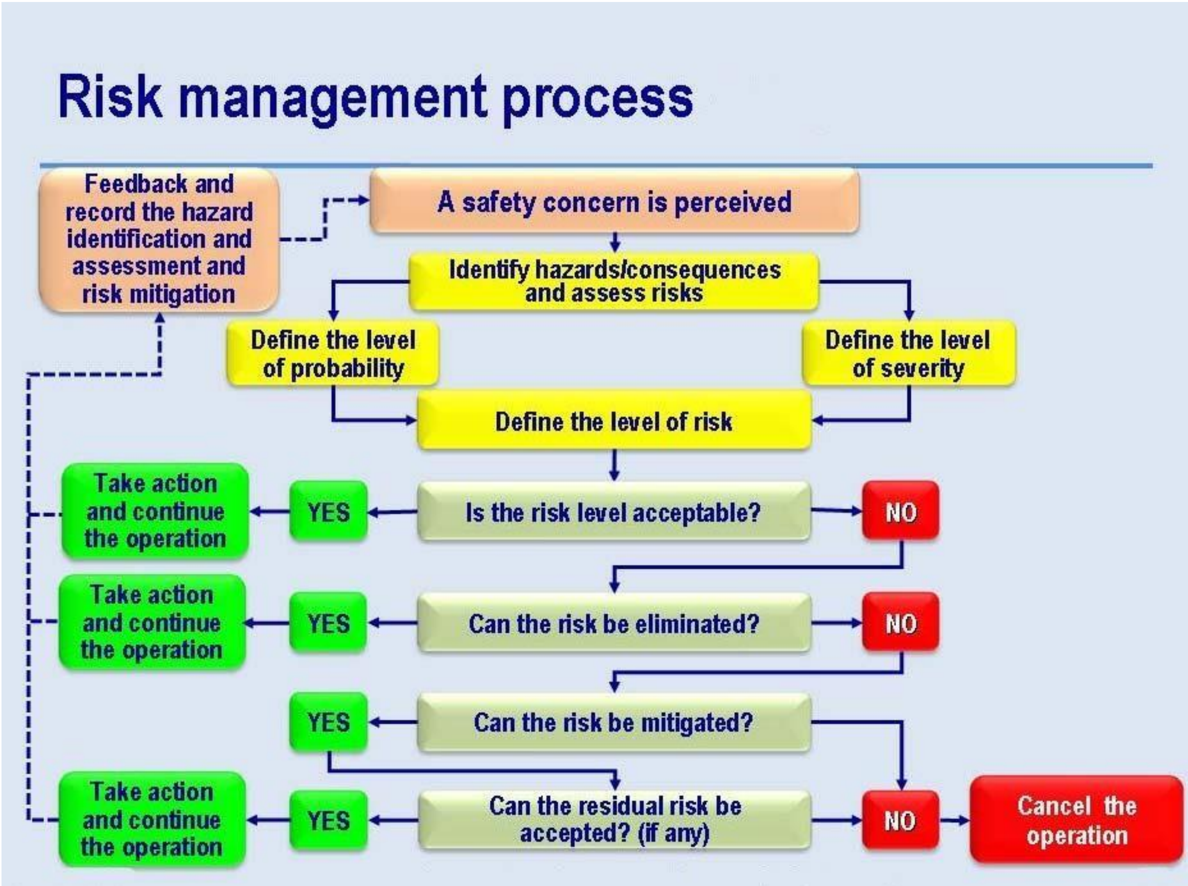


Figure 8 Risk mitigation process

2.2.7 Flight Events’ Risk assessment and mitigation Process

2.2.7.1 Risk Management.

Not all risks can be eliminated, nor are all-believable risk mitigation measures economically feasible. The risks and costs inherent in aviation necessitate a rational process for decision-making. Daily, decisions are made in real time, weighing the probability and severity of any adverse consequences implied by the risk against the expected gain of taking the risk.

This process is known as “Risk management". As shown in figure1

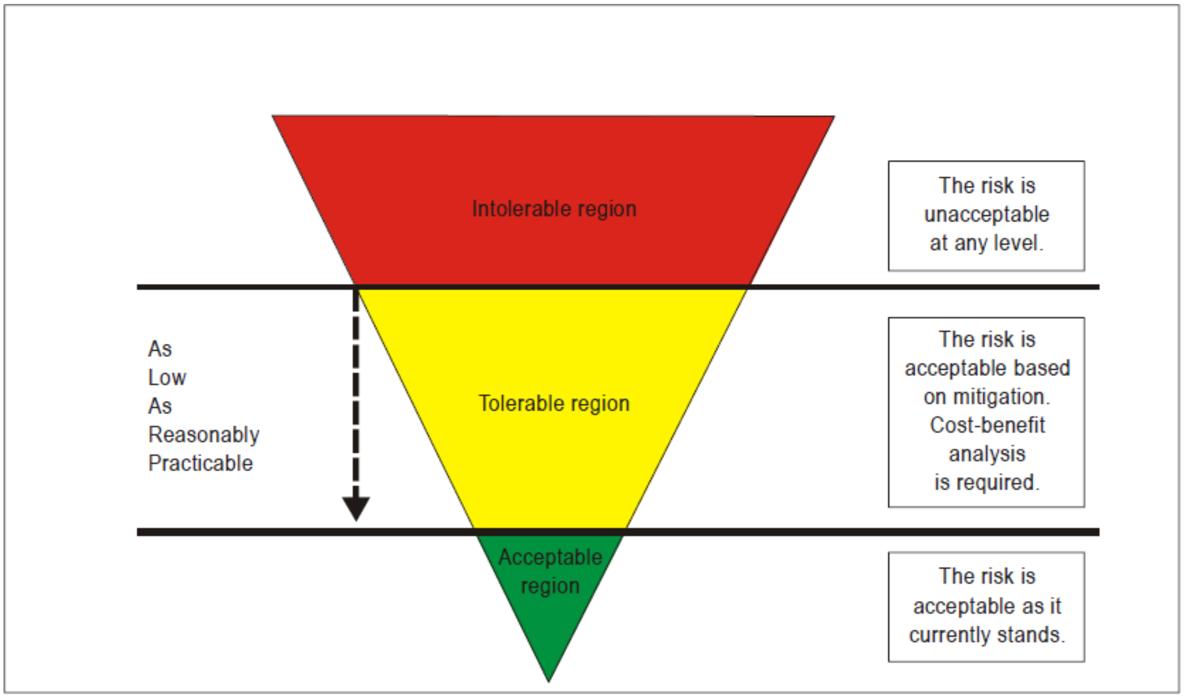


Figure 1 Risk management

Risk management facilitates the balancing act between assessed risks and viable risk mitigation. Risk management is an integral component of safety management. It involves a logical Process of objective analysis, particularly in the evaluation of the risks. The process for risk management is summarized in the flow chart in Figure 2 as the figure indicates; risk management comprises three essential elements: hazard identification, risk assessment and risk mitigation. The concepts of risk management have equal application in decision-making.

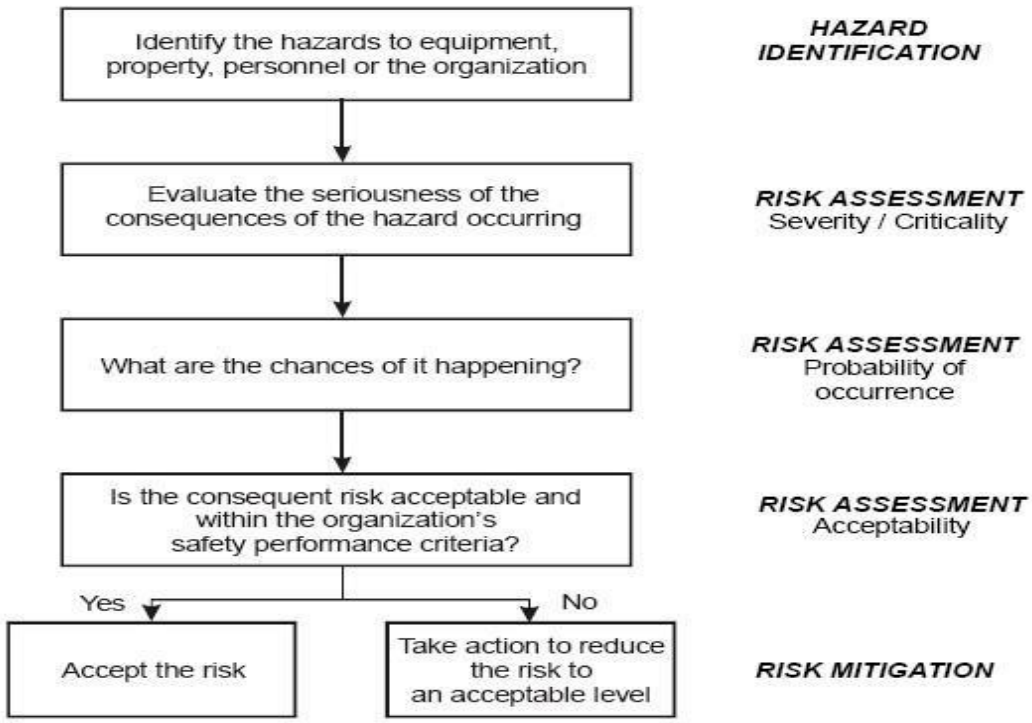


Figure 2 Risk Management Process

2.2.7.2 First fundamental – Risk management

What is it the identification? Analysis and elimination or mitigation to an acceptable level of risks that threaten the capabilities of an organization.

What is the objective? Aims at a balanced allocation of resources to address all risks and viable risk control and mitigation.

Why is it important key component of safety management systems? Data-driven approach to safety resources allocation thus defensible and easier to explain.

2.2.7.3 Second fundamental - Risk probability

Probability: The possibility that a situation of danger might occur as shown in figure 3

Questions for assessing the probability of an occurrence:

a. Is there a history of occurrences like the one being assessed, or is the occurrence an isolated event?

b. What other equipment, or similar type components, might have similar defects?

c. What number of operating personnel must follow the procedure (s) in question?

d. How frequently is the equipment or procedure under assessment used?

e. Are there organizational, management or regulatory implications that might generate larger threats to public safety?

Probability of Flight Hazard		
Qualitative definition	**Meaning**	**Value**
Frequent	**Likely to occur many times (has occurred frequently)**	**5**
Occasional	**Likely to occur sometimes (has occurred infrequently)**	**4**
Low	**Unlikely, but possible to occur (Seldom happened)**	**3**
Unlikely	**Very unlikely to occur (not known to have occurred)**	**2**
Extremely Unlikely	**Almost unthinkable this occurrence can happen**	**1**

Figure 3 risk probability

- **Corporate Flight Hazard Probability Values:**

In fact, Figure 3 only gives Flight Safety Office a guideline to define probability of a Flight Hazard, but in real world, this probability needs to be specified. In other words, there is a need to be specific to standardize the calculations of Hazard frequency of a specific flight event (hazard).

So, the following figures has been adopted for use in evaluating the frequency of Flight Hazards generated by AirFase:

Flight Hazard %	Frequency Descriptor
10.0 %	Frequent
8.0 %	Occasional
5.0 %	Low
0.1 %	Unlikely
0.0 %	Highly Unlikely

Table 1. Flight Hazard Frequency

- **Hazard Characteristics:**

In order to standardize the process of calculating the risk index of a specific flight hazard, we need to define the following bulleted items related to each Flight Hazard and its' related consequences; that is why these items are called Hazard Characteristics:

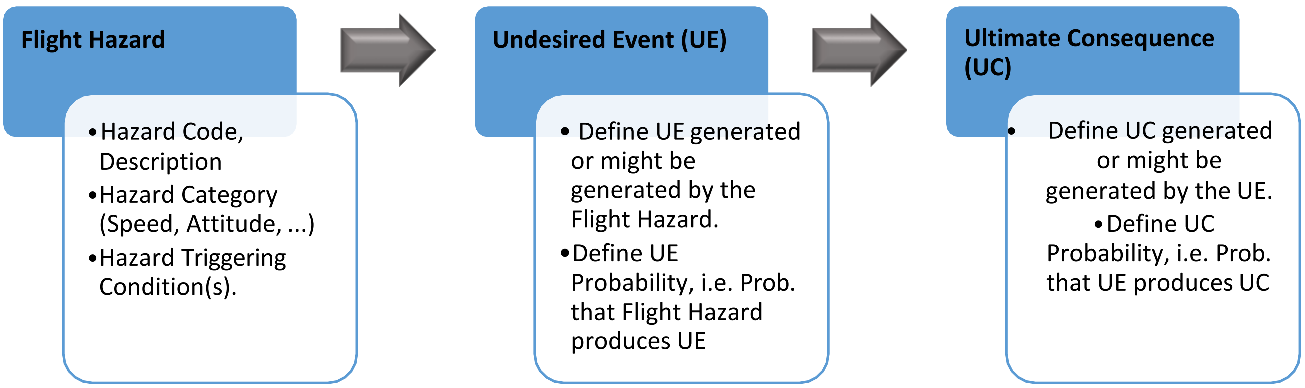


Figure 4. Hazard Characteristics

- **Undesired Event (UE) and Ultimate Consequence (UC) Probabilities guideline**

Probability	Descriptor	Remarks
5	**Always**	Happened or might happen **10** out of 10 cases
4	**Often**	Happened or might happen **6 to 9** out 10 cases
3	**Seldom**	Happened or might happen **3 to 5** out of 10 cases
2	**Unlikely**	Happened or might happen **1 to 2** out of 10 cases
1	**Never**	Happened or might happen **0** out of 10 cases

Table 2. UE and UC Probabilities

2.2.7.4 Third fundamental – Risk severity

Severity – The possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation. As shown in figure 4

Define the consequence(s) in terms of Property, Health, Finance, People and Environment.

Questions for assessing the severity of the consequences of an occurrence:

How many lives are at risk?

- Employees, Passengers and Bystanders

What is the likelihood of environmental impact?

- Spill of fuel or other hazardous product.

What is the likely extent of property or financial damage?

- Direct operator property loss
- Damage to aviation infrastructure

(Ultimate Consequence of a Flight Hazard) – UC Severity Risk Severity		
Qualitative definition	**Meaning**	**Value**
Catastrophic	- Equipment destroyed. - Multiple deaths.	**5**
Major	- A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely. - Serious injury. - Major equipment damage.	**4**
Moderate	- A significant reduction in safety margins, a reduction in the ability of the operators 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.	**3**
Minor	- Nuisance. - Operating limitations - Use of emergency procedures - Minor incident	**2**
Insignificant	- Little consequences	**1**

Figure 4 risk severity

- **Practical Risk Severity Matrix:**

			UC … Severity description (Customize according to the nature of the product or service provider's operations)					
Level	Descriptor	Result	Safety of Aircraft	Physical injury	Damage to assets	Potential revenue loss	Damage to environment	Damage to corporate reputation
1	Insignificant		No significance to aircraft-related operational safety	No injury	No damage	No revenue loss	No effect	No implication
2	Minor		Degrades or affects normal aircraft operational procedures or performance	Minor injury	Minor damage less than …. $	Minor loss less than …. $	Minor effect	Limited localized implication
3	Moderate		Partial loss of significant/major aircraft systems or resulsts in abnormal flight operations procedure application	Serious injury	Substantial damage less than …. $	Substantial loss less than …. $	Contained effect	Regional implication
4	Major		Complete failure of significant/major aircraft systems or results in emergency application of flight operations procdures	Single fatality	Major damage less than …. $	Major loss less than …. $	Major effect	National implication
5	Catastrophic		Aircraft / hull loss	Multiple fatality	Catastrophic damage more than …. $	Catastrophic loss more than …. $	Massive effect	International implication
			Note - Use the highest severity level obtained to drive the risk index in the risk index table					

Figure 5. Practical Risk Severity Matrix

2.2.7.5 Fourth fundamental - Risk Assessment (Risk Index)

Using the risk analysis matrices as shown in figure 6, it is possible to standardize the qualitative risk assessments, and categorize the hazard using risk index matrix as shown in figure 7

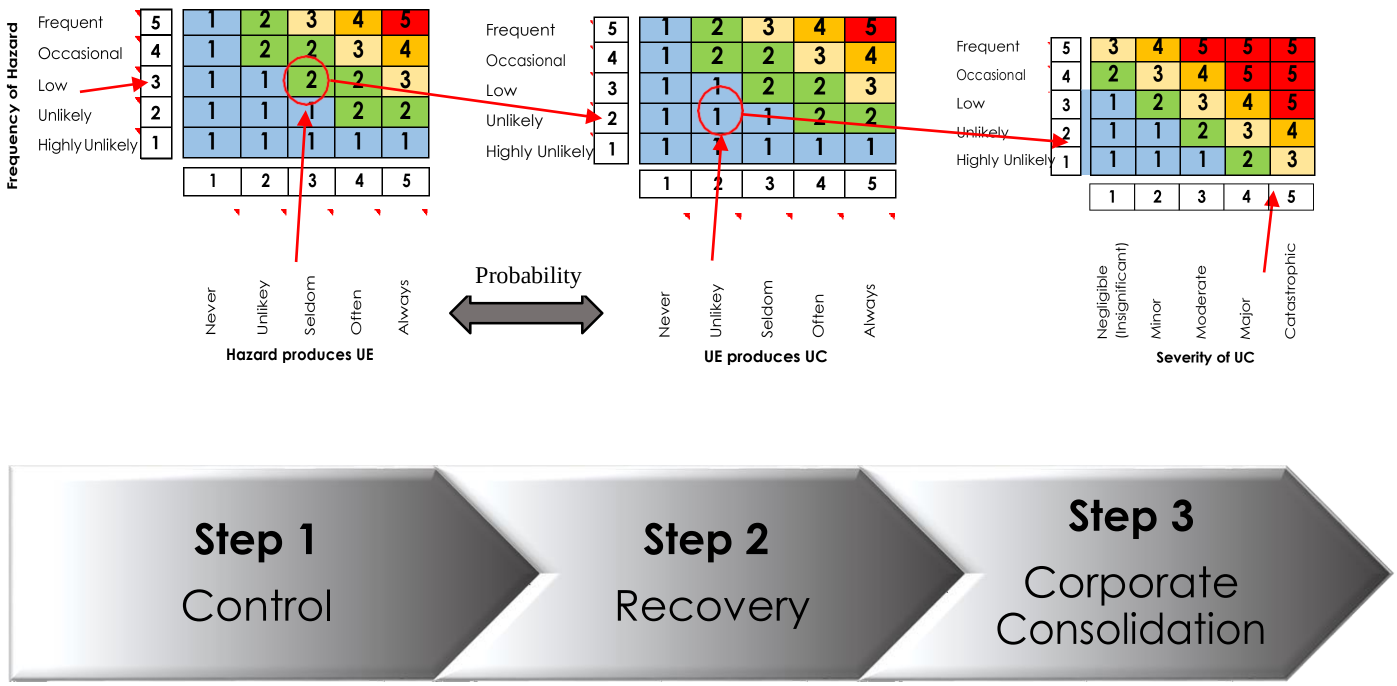


Figure 6. Risk Index Calculation Process

Risk Level	Risk Index
	5
	4
	3
	2
	1

Figure 7. Risk Index (Assessment) matrix

2.2.8.6 Fifth fundamental – Risk control / Mitigation

Mitigation*:* Measures to eliminate the potential hazard or to reduce the risk probability or severity.

Risk mitigation = Risk control

Mitigate to make milder, less severe or less harsh

Risk mitigation – Defenses

As part of the risk mitigation, determine:

a. Do defenses to protect against such risk (s) exist?
b. Do defenses function as intended?
c. Are the defenses practical for use under actual working conditions?
d. Are staffs involved aware of the risks and the defenses in place?
e. Are additional risk mitigation measures required?

Recalling the three basic defenses

- Technology
- Training
- Regulations

Avoidance: The operation or activity is cancelled because risks exceed the benefits of continuing the operation or activity. e.g. Regular operations into an aerodrome surrounded by complex geography and without the necessary aids are cancelled.

Reduction: The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the accepted risks. e.g. Regular operations into an aerodrome surrounded by complex geography and without the necessary aids are continued based upon the availability of specific aids and application of specific procedures.

Segregation of exposure: Action is taken to isolate the effects of risks or build-in redundancy to protect against it, i.e., reduces the severity of risk.

Note: Figure 9 showing risk mitigation and Figure 10 showing risk mitigation process.

Risk Index	Mitigation	Action Required
5	Stop	Stop operation or process immediately. Unacceptable under the existing circumstances. Do not permit any operation until sufficient control measures have been implemented to reduce the risk to an acceptable level. Top Management approval required.
4	Improve	Caution. Ensure that risk assessment has been satisfactorily completed and declared preventive controls are in place. Departmental management approval of risk assessment before commencement of the operation or process.
3	Secure	Perform or review risk mitigation as necessary. Departmental approval of risk assessment.
2	Monitor	Risk mitigation or review is optional.
1	Accept	Acceptable as is. No risk mitigation required.

Figure 8. Mitigation and Action Required with Respect to Risk Index

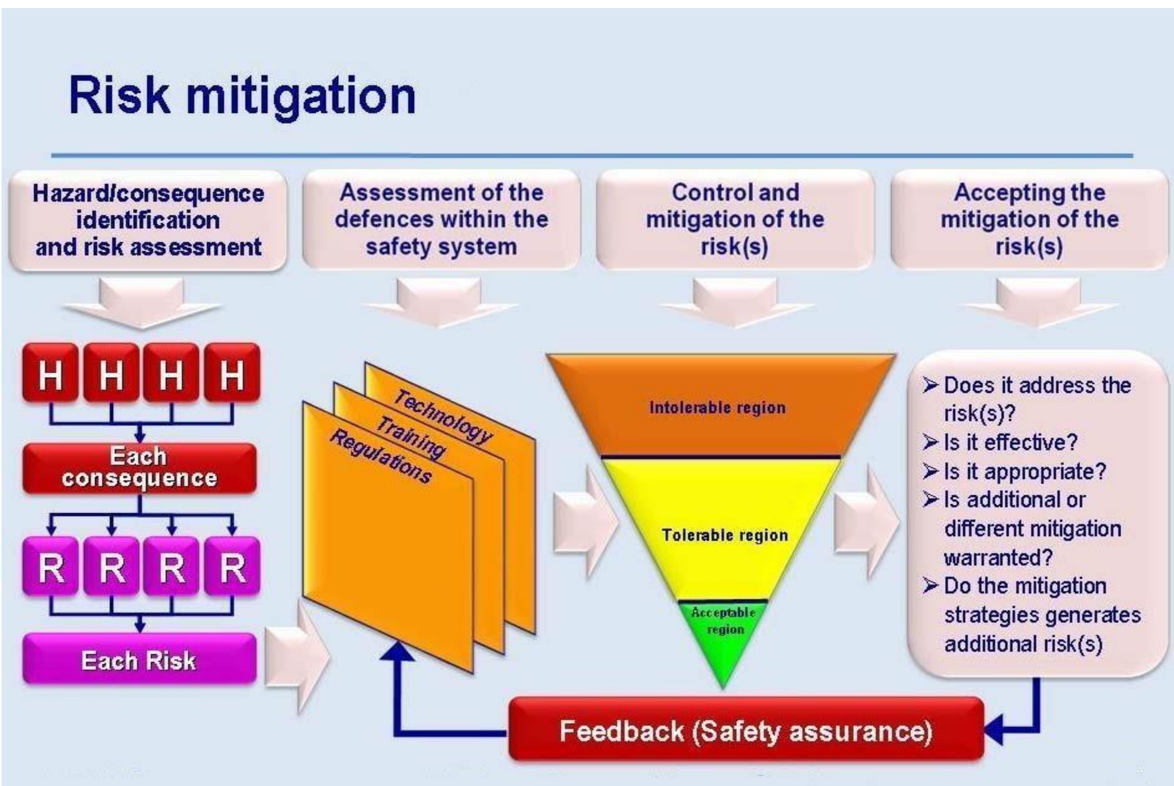


Figure 9. Risk Mitigation Schematic

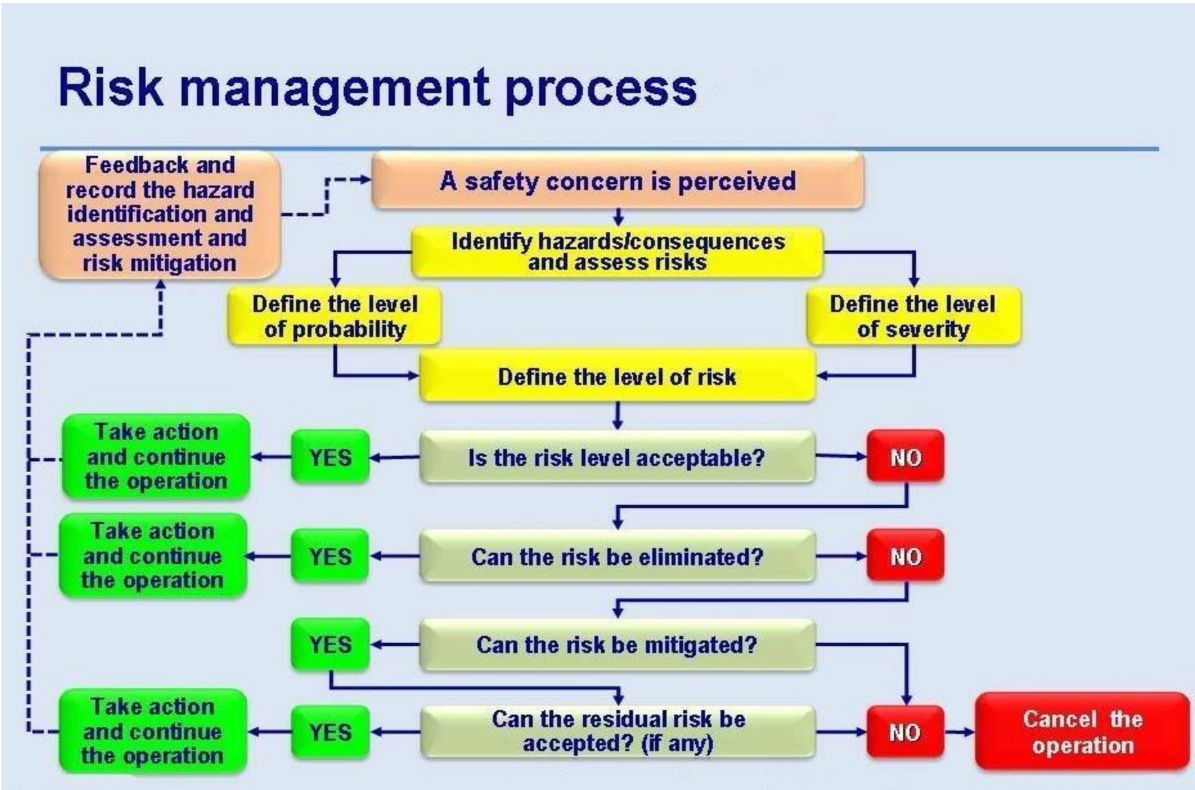


Figure 10. Risk Mitigation Process

Risk Mitigation Factors

The following Mitigation Factors (SHELL; derived from CRM model) should be taken into account when building defenses at all levels:

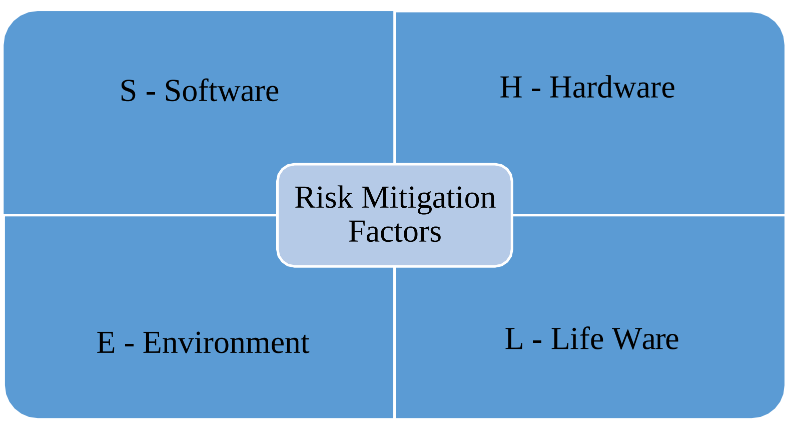


Figure 11. Risk Mitigation Factors

2.2.7.7 Formal Risk Assessment Process Summary:

1. Define Flight Hazard …:
a. Code
b. Description
c. Category
d. Triggering Condition
e. Frequency level over a specific period; it should be calculated.
2. Undesired Event (UE):
a. Define Undesired Event (UE) generated or might be generated from Hazard
b. Define Probability of UE; i.e. probability that Hazard produces UE (Table 2)
3. Ultimate Consequence (UC):
a. Define Ultimate Consequence (UC) generated or might be generated from UE
b. Define Probability of UC; i.e. probability that UE produces UC (Table 2)
c. Define UC Severity Level. (Figure 5)
4. Calculate Risk Index:
a. Apply Step 1 as shown in Figure 6
b. Apply Step 2 as shown in Figure 6
c. Apply Step 3 as shown in Figure 6
5. Risk Mitigation:
a. Get Risk Mitigation and Action required using table 7
6. Risk Assessment Form:
a. Generate a Risk Assessment Form to reflect the abovementioned data
7. Risk Mitigation Factor(s):
a. Define Risk Mitigation Factors using Figure 11 in the generated Risk Assessment form after being agreed with the Departmental Head.
8. Defenses to build:
a. Write down the defenses to build in the generated Risk Assessment Form to reflect the agreed Risk Mitigation Factors.
1. Follow up of actions taken (defenses to build):
a. Make certain that all actions to be taken are in place and distributed to concerned parties (Feedback)

2.2.7.8 Flight Risk Assessment Form Sample

Risk Assessment Form						
Form Issue Date		**To Head of Department**				
Risk Assessment Ref. No.						
Follow-up required	**For Information**	**For Review**	**For Action**			
Type of Operation or Activity		**Generated by**				
Risk Assessment						
Hazard Characteristics	**Description (Event Name)**					
	Explanation					
	Category	**Trigger Condition**	**Limitation/Tolerance/Threshold**		**Acceptable Threshold**	
Risk prob.	**Period**	**Period details**	**Risk probability**	**Descriptor**	**Value**	
	This period					
	Previous Period					
Risk Severity of occurrence		**Severity Of Occurrence**	**Meaning (Description)**		**Value**	
Risk Index	**Risk Index – This Period**		**Action required**	**Action Description**		
	Risk Index – Previous Period		**Action Required**	**Action Description**		
	Risk Index & Action required decoding			**5 - Stop / 4 - Improve / 3 - Secure / 2 - Monitor / 1 - Accept**		
Risk Management	**Mitigation Factors**					
	Define SHELL model strategy					
	Balance Safety/Production					
	Notes:	**S - Software / H - Hardware / E - Environment / L - Life ware**				
		Balance should be considered between Safety and production				
	Defenses and mitigation					
	Existing Defenses	**Defenses to build**	**Responsible Person**	**Action/Doc. Ref.**		

Signatures

Safety & Quality Dept. ……………. **Department Director/Manager ………………**

Note: Normally, risk assessment(s) shall be issued from Safety Department on quarterly basis; unless the situation dictates for shorter period, and consequently the issued risk assessment(s) shall be re-evaluated over the next quarter (or equal period) from risk index point of view, after implementation of the agreed (defenses to build), and the re-evaluation outcome shall be notified to the concerned Department Head and AE.

Form No. 351A

2.3 Incident and Accident Investigation

2.3.1 General

Effective safety management system depends on the investigation and analysis of safety issues. The safety value of an accident, a hazard or an incident is largely proportional to the quality of the investigative effort. The technical aspects of accident and incident investigation used by the safety & quality directorate and other personnel in the course of an investigation, Requirements regarding mandatory reports to the ECAA.

i. Accident

An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked in which a person is fatally or seriously injured, the aircraft sustains substantial damage, or the aircraft is missing or is completely inaccessible.

ii. Incident

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

iii. Occurrence

To indicate an accident or incident from the perspective of safety management, there is a danger in concentrating on the difference between accidents and incidents using definitions that may be arbitrary and limiting. Many incidents occur every day which may or may not be reported to the investigation authority but which come close to being accidents often exposing significant risks. Since there is no injury, or little or no damage, such incidents might not be investigated. This is unfortunate because the investigation of an incident may yield better results for hazard identification than the investigation of an accident. The difference between an accident and an incident may simply be an element of chance. Indeed, an incident may be thought of as an undesired event that under slightly different circumstances could have resulted in harm to people or damage to property and thus would have been classified as an accident.

iv. Investigation

A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations.

v. Investigator-In-Charge

A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation. This will normally be the Quality & Safety director.

vi. Serious Incident

An incident involving circumstances indicating that an accident nearly occurred. The difference between an accident and a serious Incident lies only in the result.

vii. Serious Injury

An injury which is sustained by a person in an accident and which:

- Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received.
- Results in a fracture of any bone (except simple fractures of fingers, toes, or nose).
- Involves lacerations which cause severe, nerve, muscle or tendon damage,
- Involves injury to any internal organ.
- Involves second or third degree bums, or tiny burns affecting more than 5 percent of the body surface.
- Involves verified exposure to infections subs lances or injurious radiation.

2.3.2 In-House Investigations

i. Most occurrences do not warrant investigations by regulatory authorities. Many incidents are not even required to be reported to the State. Nevertheless, such incidents may be indicative of potentially serious hazards, perhaps systemic problems that will not be revealed unless the occurrence is properly investigated.

ii. For every accident or serious incident, there will likely be hundreds of minor occurrences, many of which have the potential to become an accident. It is important that all reported hazards and incidents be reviewed and a decision taken on which ones should be investigated and how thoroughly.

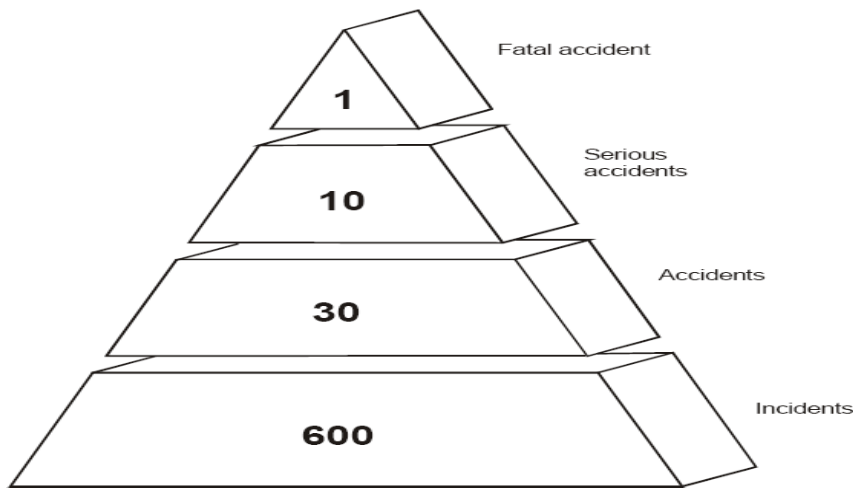
iii. For in-house investigations, the investigating team may require the assistance of specialists, depending on the nature of the occurrence being investigated, for example:

- Cabin safety specialists for in-flight turbulence encounters, smoke or fumes in the cabin, galley fire,
- Experts in air traffic services for loss of separation, near collisions, frequency congestion, etc.;
- Maintenance engineers for incidents involving material or system failures, smoke or fire, etc.; and
- Experts able to provide airport management advice for incidents involving foreign object damage (FOD), snow and ice control, airfield maintenance, vehicle operations, etc.

2.3.3 Scope of safety investigations

i. Research into industrial safety in 1969 indicated that for every 600 reported occurrences with no injury or damage, there were some:

- 30 incidents involving property damage;
- 10 accidents involving serious injuries; and
- 1 major or fatal injury.



ii. The (1:600 Rule, ratio:1-10-30-600) is an indicative of a wasted opportunity if investigative efforts are focused only on those rare occurrences where there is serious injury or significant damage. The factors contributing to such accidents may be present in hundreds of incidents and could be identified before serious injury or damage. Effective safety management requires that staff and management identify and analyses hazards before they result in accidents.

iii. In aviation incidents, injury and damage are generally less significant than in accidents.

iv. Accordingly, there is less publicity associated with these occurrences. In principle, more information regarding such occurrences should be available (e.g. live witnesses and undamaged flight recorders).

v. Without the threat of substantial damage suits, there also tends to be less of an adversarial atmosphere during the investigation. Thus, there should be a better opportunity to identify why the incidents occurred and, equally, how the defenses in place prevented them from becoming accidents. In an ideal world, the underlying safety deficiencies could all be identified and preventive measures to ameliorate these unsafe conditions could be initiated before an accident occurs.

vi. How far should an investigation look into minor incidents and hazard reports?

vii. The extent of the investigation should depend on the actual or potential consequences of the occurrence or hazard. Hazard or incident reports that indicate high-risk potential should be investigated in greater depth than those with low-risk potential.

viii. The depth of the investigation should be that which is required to clearly identify and validate the underlying hazards. Understanding why something happened requires a broad appreciation of the context for the occurrence. To develop this understanding of the unsafe conditions, the investigator should take a systems approach, perhaps drawing on the SHEL model outlined in human factors (chapter 4.3) in this manual. Resources are normally limited, thus the effort expended should be proportional to the perceived benefit in terms of potential for identifying systemic hazards and risks to the organization.

ix. Although the investigation should focus on the factors that are most likely to have influenced actions, the dividing line between relevance and irrelevance is often blurred. Data that initially may seem to be unrelated to the investigation could later prove to be relevant once relationships between different elements of the occurrence are better understood.

2.3.4 Investigation Policy and Objectives

i. In addition to investigating all incidents, it is Nesma Airlines policy to also conduct an in-house formal investigation following an accident or serious incident, even where it is also subject to government investigation. This shall enable Nesma Airlines to ascertain quickly whether any immediate changes in procedures are necessary. Typically, Nesma Airlines may be asked to investigate and make a report to ECAA.

ii. All internal accident/incident investigations may be carried out by the following:

- Safety & Quality Director;
- Operations Director;
- Technical Director;
- Chief Inspector;
- Chief Pilot;
- and, others assigned by the Accountable Executive.

Investigations seek to determine not only the immediate causes, but the underlying or root causes as well. Appropriate prevention and intervention procedures will then be developed and remedial action will be recommended to prevent future similar occurrences at the same time measuring the effectiveness of that corrective or remedial action after made them available to line managers to eliminate hazards or mitigate unacceptable risk.

2.3.5 Accident / Incident Notification

i. In the event of an accident, the Safety and Quality Director shall be notified per the procedures contained in Nesma Airlines ERP When an incident occurs, Safety and Quality Director shall also be immediately notified by the most expeditious means. Such incidents may include, but are not limited to, any occurrence, other than an accident placing doubt on the continued safe operation of the aircraft and which:

- Jeopardize (risk) the safety of the crew, passengers or aircraft, but terminated without serious injury or substantial damage,
- Caused damage to, or failure of, any major component not resulting in substantial damage or serious injury, but which will require the replacement or repair of that component.

- Jeopardize the safety of the crew, passengers or aircraft and avoided being an accident only by exceptional handling of the nine raft or bychance.
- Causes trauma (severe physical injury) to crew, passengers or third parties.
- Could be of interest to the press and news media,

ii. Specific examples include loss of engine cowlings, portions of flaps, control surfaces or fuselage panels, an altitude excursion or other ATC violation, or a minor taxiing accident, such as damage due lo collision with ground equipment.

2.3.6 Investigative Procedure

i. Upon notification, the Safety and Quality Director will determine the required level of response. In The event of an aircraft accident, personnel responsibilities are assigned as detailed in the ERP, for other incidents, the Safety and Quality Director may request assistance from appropriate areas there are two levels of investigations:
NOTE: NESMA AIRLINES shall be represented during all investigations, the Safety and Quality Director and other investigator have uninhibited access to all areas of operations, including any and all relevant documents and files. All employees shall cooperate fully in any investigation and must not withhold any requested information.
NOTE: The failure to cooperate during an investigation, intentional withholding of relevant facts, or providing false and/or misleading information constitute grounds for immediate dismissal.

ii. As soon as a notification of an incident/accident is received, the Safety and Quality Director will ensure that all relevant documents are gathered and the evidence is preserved. When necessary, as in the case of an accident, specific technical duties will be assigned to qualified personnel. The Safety and Quality Director maintains a list of employees qualified to serve on each of the following possible ECAA investigative groups (these employees may also perform such functions in lesser incidents):

- Operations.
- Witness,
- Survival Factors.
- Air Traffic Control.
- Weather.
- Structures.
- Systems.
- Power plants

- Maintenance Records.
- Flight Data Recorder.
- Cockpit Voice Recorder VCR
- Human Performance
- Aircraft performance.

Because aircraft accident and incident investigation is a highly complex and technical field, the Safety and Quality Director should have the knowledge that maintain an appropriate level of readiness and expertise

2.3.7 Information sources

Information relevant to a safety investigation can be acquired from a variety of sources, including:

i. Physical examination of the equipment used during the safety event. This may include examining the front-line equipment used, its components, and the workstations and equipment used by supporting personnel (e.g. ATCOs, maintenance and servicing personnel).
ii. Documentation spanning a broad spectrum of the operation, for example:
   - Maintenance records and logs;
   - Personal records/logbooks;
   - Certificates and licenses;
   - In-house personnel and training records and work schedules;
   - Operator's manuals and SOPs;
   - Training manuals and syllabi;
   - Manufacturers' data and manuals;
   - Regulatory authority records;
   - Weather forecasts, records and briefing material; and 10) flight planning documents.
iii. Recordings (flight recorders, ATC radar and voice tapes, etc.). These may provide useful information for determining the sequence of events. In addition to traditional flight data recordings, maintenance recorders in new generation aircraft are a potential additional source of information.
iv. Interviews conducted with individuals directly or indirectly involved in the safety event.

These can provide a principal source of information for any investigation. In the absence of measurable data, interviews may be the only source of information.

v. Direct observation of actions performed by operating or maintenance personnel in their work environment. This can reveal information about potential unsafe conditions. However, the persons being observed must be aware of the purpose of the observations.

vi. Simulations. These permit reconstruction of an occurrence and can facilitate a better understanding of the sequence of events that led up to the occurrence, and the manner in which personnel responded to the event. Computer simulations can be used to reconstruct events using data from on-board recorders, ATC tapes, radar recordings and other physical evidence.

vii. Specialist advice. Investigators cannot be experts in every field related to operational environment. It is important that they realize their limitations. They must be willing to consult with other professionals during an investigation.

viii. Safety databases. Useful supporting information may come from accident/incident databases, in-house hazard and incident reporting systems, confidential reporting programs, systems for monitoring line operations (e.g. flight data analysis, and LOSA programs), manufacturers' databases, etc.

2.3.8 Interviews

i. Information acquired through interviews can help clarify the context for unsafe acts and conditions. It can be used to confirm, clarify or supplement information learned from other sources.

ii. Interviews can help to determine "what" happened. More importantly, interviews are often the only way to answer the important "why" questions which, in turn, can facilitate appropriate and effective safety

iii. Recommendation in preparation for an interview, the interviewer must expect that individuals will perceive and recall things differently. The details of a system defect reported by operational personnel may differ from those observed by maintenance personnel during a service check. Supervisors and management may perceive issues differently than line personnel.

iv. The interviewer must accept all views as worthy of further exploration. However, even qualified, experienced and well-intentioned witnesses could be mistaken in their recollection of events. In fact, it may be grounds to suspect the validity of the information being received if during interviews of a number of people concerning the same event, the interviewees are not presenting different perspectives.

v. Conducting interviews:

vi. The effective interviewer adapts to these differing views, remaining objective and avoiding making an early evaluation of the content of the interview. An interview is a dynamic situation, and the skilled interviewer knows when to continue a line of questioning and when to back off. To achieve the best results, interviewers will likely employ a process as follows:

- Carefully preparing and planning for the interview;
- Conducting the interview in accordance with a logical, well-planned structure; and
- Assessing the information gathered in the context of all other known information.

2.3.9 Investigation methodology

i. The field phase of an investigation is used to identify and validate perceived safety hazards. Competent safety analysis is required to assess the risks, and effective communications are required to control the risks. In other words, effective safety management requires an integrated approach to safety investigations.

ii. Some occurrences and hazards originate from material failures or occur in unique environmental conditions. However, the majority of unsafe conditions are generated through human errors. When considering human error, an understanding of the conditions that may have affected human performance or decision-making is required. These unsafe conditions may be indicative of systemic hazards that put the entire aviation system at risk. Consistent with the systems approach to safety, an integrated approach to safety investigations considers all aspects that may have contributed to unsafe behavior or created unsafe conditions.

iii. Effective investigations do not follow a simple step-by-step process that starts at the beginning and proceeds directly through each phase to completion. Rather, they follow an iterative process that may require going back and repeating steps as new data are acquired and/or as conclusions are reached.

2.3.10 Report Investigation and analysis

Every event should be investigated. The logic flow for an integrated process for safety investigations is depicted in (figure 2) Integrated Safety Investigation Methodology (ISIM) Using this type of model can guide NESMA AIRLINES safety investigator from the initial hazard or incident notification through to the communication of safety lessons learned. More detailed analysis is required to establish the organizational factors that contributed to the error.

NESMA AIRLINES investigator or team of investigators must be technically competent and have access to background information, so the facts and events are interpreted accurately. The investigator should have the confidence of the staff and the investigation process should be a search to understand how the mishap happened, not a hunt for someone to blame. For incident and accident investigation procedure

An Incident Investigation Report (form no. 382) will be filled by the investigation team leader for the purpose of recording the incident/accident data, Identifying and correcting problems and to ensure that policies are revised or new systems implemented, as needed, to prevent a recurrence.

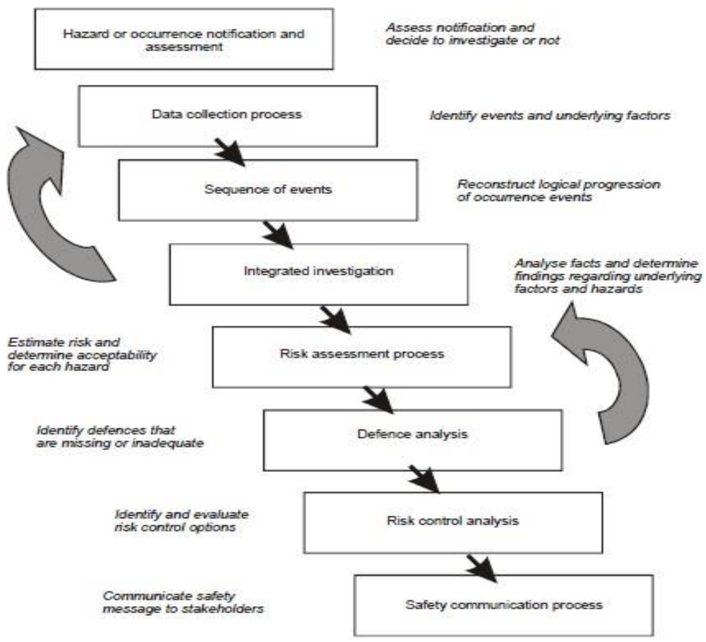


Figure 2-incident and accident investigation procedure

2.3.11 Integrated Safety Investigation Methodology (ISIM)

Investigating human performance issues

i. Investigators have been quite successful in analyzing the measurable data pertaining to human performance, e.g. strength requirements to move a control column, lighting requirements to read a display, and ambient temperature and pressure requirements. Unfortunately, the majority of safety deficiencies derive from issues that do not lend themselves to simple measurement and are thus not entirely predictable. As a result, the information available does not always allow an investigator to draw indisputable conclusions.

Several factors typically reduce the effectiveness of a human performance analysis. These include:

- The lack of normative human performance data to use as a reference against which to judge observed individual behavior;
- FDA, data provide a baseline to better understand normal day-to-day performance in aviation operations.
- The lack of a practical methodology for generalizing from the experiences of an individual to an understanding of the probable effects on a large population performing similar duties;
- The lack of a common basis for interpreting human performance data among the many disciplines (e.g. engineering, operations and management) that make up the aviation community; and
- The ease with which humans can adapt to different situations, further complicating the determination of what constitutes a breakdown in human performance.

ii. The logic necessary to convincingly analyses some of the less tangible human performance phenomena is different from that required for other aspects of an investigation. Deductive methods are relatively easy to present and lead to convincing conclusions. For example, a measured wind shear produced a calculated aircraft performance loss, and a conclusion could be reached that the wind shear exceeded the aircraft's performance capability. Such straight cause/effect relationships cannot be so easily established with some human performance issues such as complacency, fatigue, distraction or judgment. For example, if an investigation revealed that a crew member made an error leading to an occurrence under particular conditions (such as complacency, fatigue or distraction), it does not necessarily follow that the error was made because of these preconditions. There will inevitably be some degree of speculation involved in such a conclusion. The viability of such speculative conclusions is only as good as the reasoning process used and the weight of evidence available.

iii. Inductive reasoning involves probabilities. Inferences can be drawn from the most probable or most likely explanations of behavioral events. Inductive conclusions can always be challenged, and their credibility depends on the weight of evidence supporting them. Accordingly, they must be based upon a consistent and accepted reasoning method.

iv. Analysis of human performance issues needs to take into account the objective of the investigation (i.e. understanding why something happened). Occurrences are seldom the result of a single cause. Although individual factors when viewed in isolation may seem insignificant, in combination they can result in a sequence of events and conditions that culminate in an accident. The SHEL model provides a systematic approach to examining the constituent elements of the system, as well as the interfaces between them.

v. Understanding the context in which humans err is fundamental to understanding the unsafe conditions that may have affected their behavior and decision-making. These unsafe conditions may be indicative of systemic risks posing significant accident potential.

2.3.12 Safety recommendations

Formal safety recommendations warrant written communications. This ensures that the recommendations are not misunderstood and provides the necessary baseline for evaluating the effectiveness of implementation. However, it is important to remember that safety recommendations are only effective if they are implemented. When an investigation identifies hazards or unmitigated risks, safety action is required. The need for action must be communicated by means of safety recommendations to those with the authority to expend the necessary resources. Failure to make appropriate safety recommendations may leave the risk unattended. For those formulating safety recommendations.

The following considerations may apply:

i. Action agency. Who can best take the necessary corrective action? Who has the necessary authority and resources to intervene? Ideally, problems should be addressed at the lowest possible level of authority, such as the departmental or company level as opposed to the national or regulatory level. However, if several organizations are exposed to the same unsafe conditions, extending the recommended action may be warranted. State and international authorities or multinational manufacturers may best be able to initiate the necessary safety action.

ii. What versus how. Safety recommendations should clearly articulate what should be done, not how to do it. The focus is on communicating the nature of the risks requiring control measures. Detailed safety recommendations which spell out exactly how the problem should be fixed, should be avoided. The responsible manager should be in a better position to judge the specifics of the most appropriate action for the current operating conditions. The effectiveness of any recommendation will be measured in terms of the extent to which the risks have been reduced, rather than strict adherence to the wording in the recommendation.

iii. General versus specific wording. Since the purpose of the safety recommendation is to convince others of an unsafe condition putting some or all of the system at risk, specific language should be used in summarizing the scope and consequences of the identified risks. On the other hand, since the recommendation should specify what is to be done (not how to do it), concise wording is preferable.

iv. Recipient’s perspective. In recommending safety action, the following considerations pertain to the recipient’s perspective:

- The safety recommendation is addressed to the most appropriate action authority (i.e. the one having the jurisdiction and authority to effect the necessary change).
- There are no surprises (i.e. there has been prior dialogue concerning the nature of the assessed risks).
- It articulates what should be done, while leaving the action authority with the latitude to determine how best to meet that objective

Nesma Airlines نسماللطيران	**Incident Investigation Report**	**Safety and Quality Department**

Report No.:   **Report Date:**   **Department Name:**

Section 1: Details of person completing the report

Name: **Position:**

Section 2: Details of investigation team

Name: **Position:**

Name: **Position:**

Name: **Position:**

Section 3: Details of persons interviewed

Name: **Position:**

Name: **Position:**

Name: **Position:**

Section 4: Incident description *(what happened)*

Provide a summary of the facts of the incident:

Section 5: Contributing factors *(why it happened)*

List all contributing factors to the incident (human, environmental, systems, design):

Issue No.: 1 **Issue Date: Dec. 2016**	**Page 1 of 2**	**Form No.: 382**

Nesma Airlines نسما للطيران	Incident Investigation Report	Safety and Quality Department

Section 6: Risk identification & Analysis

1. Identify all risks that are relevant to the incident	*2. Identify any existing controls in place to manage the risks*	*3. Are the existing controls effective?*	
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No

Section 7: Corrective actions plan

What actions have been undertaken or will be undertaken to prevent the incident from reoccurring?

Corrective action	*Responsibility*	*Due date*	*Completed date*

Section 8: Recommendations & Notes

Name:

Signature:

Issue No.: 1 **Issue Date: Dec. 2016**	**Page 2 of 2**	**Form No.: 382**

2.4 The Mandatory Occurrence Reporting System (ECAR 19, ECAR 39)

2.4.1 Subject matter and scope and applicability

The ECAR's lays down rules on:

1. The reporting of occurrences which endanger or which, if not corrected or addressed, would endanger an aircraft, its occupants, any other person, equipment or installation affecting aircraft operations; and the reporting of other relevant safety-related information in that context;
2. Analysis and follow-up action in respect of reported occurrences and other safety-related information;
3. The protection of aviation professionals;
4. Appropriate use collected safety information;
5. The dissemination of anonymized information to interested parties for the purpose of providing such parties with the information they need in order to improve aviation safety.

This applies to occurrences and other safety-related information involving civil aircraft.

2.4.2 Objectives

Nesma Airlines ensures that relevant safety information relating to civil aviation is reported, collected, stored, protected, exchanged, disseminated and analyzed.

Accordingly, as per ECAR 39, ECAA ensures:

1. That, where appropriate, safety action is taken in a timely manner based on analysis of the information collected;
2. The continued availability of safety information by introducing rules on confidentiality and on the appropriate use of information and through the
3. harmonized and enhanced protection of reporters and persons mentioned in occurrence reports; and

The sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability.

2.4.3 Notification of Critical and High-Profile Accident / Incidents

The ECAA has reporting system (24/7) for critical or high-profile accident/incident.

The Chief Inspector shall directly report such accident /incident to the Duty Inspector over telephone. The contact number for Duty Inspector is published in the ECAA web site (www.civilaviation.gov.eg). Critical and High-Profile Accident / Incidents include the following: -

1. Aircraft Accident – Fatal and Non-fatal: -
    - Nesma aircraft.
    - Leased aircraft.
2. Airborne Serious Emergency affecting the safety of the aircraft: -
    - Nesma aircraft.
    - Leased aircraft.
3. Major incident at airport affecting airside operational safety: -
    - Crash on Airport.
    - Aircraft evacuation due to potential hazard.
    - Major system, structural failure or labor dispute causing serious disruption to operations.
    - Illegal Acts.
    - Aircraft Hijacking.
    - Hostage taking.
    - Terrorist activities.
    - Bomb threats/ Bomb found in civil aircraft/ airport terminal building.
4. High-Profile Incidents - Civil Aviation Incident with possible: -
    - Government Interest.
    - Media Interest.
    - Foreign Civil Aviation Authority Interest.
    - Any other incident at the discretion of the originator.

2.2.4 List of Examples of Occurrence Reports.

Airworthiness occurrences

1. Primary structural failure;
2. Engine structural failure;
3. Control system failure;
4. Aircraft structure that requires major repair;
5. Cracks, permanent deterioration or corrosion of aircraft structure, if more than the maximum acceptable to the manufacturer or to the ECASA;
6. Engine(s) removed prematurely because of malfunction, failure or defect;
7. Damage which necessitates repair before further flight;
8. The use of any non-standard procedure by the ground crew to deal with an emergency;
9. Use of incorrect oil, hydraulic fluid or other essential fluids;
10. Any other failure, malfunction or defect that may endanger the safe operation of the aircraft.

Operational occurrences

1. The declaration of an emergency situation
2. The use of any non-standard procedure by the flight crew to deal with an emergency;
3. Abandoned take-off, over-running the end sides of the runway or go-around.
4. Each interruption to a flight, unscheduled change of aircraft en route, unscheduled stop or diversion from a route caused by known or suspected difficulties or malfunctions;
5. The use of any non-standard procedure by the crew to deal with an emergency volcanic activity;

Flight Safety Occurrences

1. Pressurization system malfunction necessitating a change in flight plan or the use of emergency or stand by oxygen system
2. Fires during flight and related fire warning system is operating properly
3. An engine exhaust system that causes damage during flight to the engine, adjacent structure equipment or component.
4. Fuel or fuel dumping system that affects fuel flow or causes hazardous leakage during flight.

5. Abnormal landing gear extension or retraction, or un-programmed opening or closing of landing gear doors during flight
6. Engine shutdown during flight due to flame out;
7. Engine shutdown during flight due to foreign object ingestion or icing;
8. Shutdown during flight of more than one engine;
9. Failure in propeller feathering system or ability of the system to control over speed during flight;
10. Brake system components that result in loss of brake actuating force when the aircraft is in motion on the ground;
11. An engine exhaust system that causes damage during flight to the engine, adjacent structure, equipment or components;
12. An aircraft component that causes accumulation or circulation of smoke, vapor, toxic or noxious fumes in the crew compartment or passenger cabin during flight;
13. Engine shutdown during flight when external damage to the engine or aircraft structure occurs;
14. Each interruption to a flight, unscheduled change of aircraft en route, unscheduled stop or diversion from a route caused by known or suspected difficulties or malfunctions;
15. Propeller feathering in flight;
16. Any part of the aircraft becoming detached in flight;
17. Injury to a passenger as a result of turbulence,
18. The scalding of a number of a cabin staff as a result of faulty design, inadequate servicing or incorrect handling of galley equipment;
19. Precautionary, forced, emergency or heavy landing
20. An emergency evacuation of the aircraft;
21. Inability to relight or restart a serviceable engine;
22. Significant leakage of fuel, hydraulic fluid or oil;
23. Failure or malfunction of radio or navigational equipment beyond what is allowable in the MEL;

24. A complete loss of more than one electrical power generating or hydraulic power system during a given operation of the aircraft;
25. A malfunction of emergency equipment;
26. Defects causing any abnormal vibration or buffeting;
27. Engine surging sufficient to cause loss of power or to require subsequent remedial action;
28. Occurrence of stall warning;
29. Poor height keeping while operating through RVSM airspace which displays total vertical error equal to or greater than 300ft (90m);
30. Altimeter system error equal to or greater than 245 ft (75 m);
31. Assigned altitude deviation equal to or greater than 300 ft (90 m).
32. Incorrect fuel or cargo loading which endanger the aircraft in flight;
33. Balloon envelope tear in flight;
34. On a multi-engine rotorcraft, loss of drive of one engine;
35. Operation of any rotorcraft transmission condition-warning system;
36. Malfunction of any rotorcraft auto stabilization mode;
37. Fires during flight not protected by a related fire warning system;
38. Aircraft components or systems that result in taking emergency actions during flight. False fire warning during flight;
39. A complete loss of more than one electrical power generating or hydraulic power system during a given operation of the aircraft;
40. Pilot incapacitation during aircraft flight Phases.

Airspace occurrences

1. Near collision.
2. Unauthorized airspace incursion.
3. Clearance/instruction deficiency.
4. Loss of separation.
5. Breach of other clearance.
6. Flight information deficiency.
7. Unauthorized altitude penetration.

8. Pilot flight planning deficiency.
9. TCAS Alert (RA-TA intruder relative altitude in feet relative position o'clock).

Facility malfunction

1. Failure/non availability.
2. Excessive bends/roughness.
3. Readability deficiency.
4. Coverage/intensity deficiency.
5. False overhead/distance indication.
6. Alignment/course deficiency.
7. Identification deficiency.

Aerodrome occurrences

1. Physical surface deficiency.
2. Physical obstruction.
3. Public protection deficiency.
4. Surface marking deficiency.
5. Equipment/installation deficiency.
6. Wildlife incursion.
7. Apron management deficiency.

Dangerous goods

1. Spillage/leak age.
2. Fumes/gas/smoke/fire.
3. Missing non declaration.

Bird hazard

1. Strike.
2. Near Strike.

2.5 Protection of Safety Data & Safety Information (ECAR 19 App. A)

2.5.1 Scope

As per ECAA requirements Nesma shall ensure that protection of safety data & safety information applied in accordance with the principles mentioned in the appendix A of ECAR 19.

Safety data captured by and safety information derived from, mandatory and voluntary safety reporting systems and other related sources such as audit result.

Nesma Airlines is committed to implement protection policy to their employees as an element of their SMS.

2.5.2 Objective

The objective of protecting safety data, information and other related sources is to maintain and improve safety by continued availability.

The purpose of preventive, corrective or remedial actions in basis of reports of safety data, information or other related sources; is to improve safety.

2.5.3 Protection levels

1. Protecting safety data captured by, and information derived from Voluntary reporting system is a Standard, also from Mandatory reporting system is a Recommended to ensure contained availability
2. In certain jurisdictions, safety data and safety information captured by mandatory and voluntary safety reporting systems are subject to different levels of protection, offering greater protection to safety data and safety information from voluntary systems compared to safety data and safety information from mandatory ones. This distinction can be justified by the need to incentivize the voluntary provision of safety data or safety information in ways that are not seen to be necessary in the case of a mandatory reporting system.
3. Protection of sensitive safety data and information available on public domain for instance through a leak to the media, ECAA should refrain from further disclosure of the leaked data and information

2.5.4 Protection Principles

1. The principles of protection apply to safety data, safety information and related sources

2. It's important to protect reporters as well as the safety data and information, by not punishing them on reporting basis
3. The protections are not intended to relieve sources of their safety related obligations or interfere with the proper administration of justice
4. Protective data, information and other related sources are not prevented ECAA from using it and take the necessary actions which support maintaining or improving safety
5. Preventive, corrective or remedial actions should avoid possible adverse impacts (such as financial or reputational) on the source of safety data, information or other related sources.
6. This protection provides also ensures the clarity and transparency.
7. The confidence to report errors and experiences with relevant data and information is necessary to address existing and potential safety deficiencies and hazards for effective safety management system.
8. Protective data, information and other related sources allow ECAA and Nesma to take the appropriate steps for:
   a. Guard against the potential for immediate harm or injury as a result of a safety risk until that risk can be identified and mitigated
   b. Ensure that appropriate actions are taken to minimize the likelihood that such a risk might occur again in the future
   c. Prevent exposure to an unmitigated safety risk
   d. Ensure the integrity of the reporting system itself and the larger system of which the reporting system is a part.
9. Encouraging people to report relevant data or safety information requiring trusted reporting environment which means that "employees and operational personnel trust their actions will not be punished, and those actions is appropriate with their trainings and experiences", this trusted environment is the fundamental of effective and efficient reporting.
10. Appropriate actions with person's trainings and experiences will be reasonable if their other person with the same level of this qualifications might do or fail to do, the same action had been taken.

Chapter (3)
Safety Assurance

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Part (3) – Table of Content		
S/N	**Chapter Section**	**Chapter Name**
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2	**Chapter 3.2**	Safety Performance
3	**Chapter 3.3**	Safety Audit
4	**Chapter 3.4**	The Management of change
5	**Chapter 3.5**	Continues Improvement of safety system

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3.1 Safety Performance Monitoring

3.1.1 Introduction

i. Safety management requires feedback on safety performance to complete the safety management cycle. Through feedback, system performance can be evaluated and any necessary changes effected. In addition, all stakeholders require an indication of the level of safety within an organization for various reasons, for example:

- Staff may need confidence in their organization's ability to provide a safe work environment.
- Line management requires feedback on safety performance to assist in the allocation of resources between the often-conflicting goals of production and safety.
- Passengers are concerned with their own mortality,
- Senior management seeks to protect the corporate image (and market share),
- Shareholders wish to protect their investment

ii. Although the stakeholders in an organization's safety process want feedback, their individual perspectives as to "what is safe?" vary considerably. Deciding what reliable indicators exist for acceptable safety performance depends largely upon how one views "safety", for example:

- Senior management may seek the unrealistic goal of *"zero accidents"*. Unfortunately, as long as aviation involves risk, there will be accidents, even though the accident rate may be very low,
- Regulatory requirements normally define minimum *"safe"* operating parameter, e.g. cloud base and flight visibility limitations. Operations within these parameters contribute to "safety", however, they do not guarantee it.

iii. Statistical measures are often used to indicate a level of safety, e.g. the number of accidents per hundred thousand hours, or fatalities per thousand sectors flown. Such quantitative indicators mean little by themselves, but they are useful in assessing whether safety is getting better or worse over time.

3.1.2 Quality assurance:

i. A quality assurance system (QAS) defines and establishes NESMA AIRLINES corporate policy and objectives. It ensures that elements necessary to improve efficiency and reduce risks are in place. If properly implemented, a QAS ensures that procedures are carried out consistently and in compliance with applicable requirements that problems are identified and resolved, reviews and improves its procedures, products and services. A QAS should identify problems and improve procedures in Older to meet corporate objectives.

ii. QAS helps ensure that the requisite systemic measures have been taken to meet NESMA AIRLINES safety goals. However, quality assurance does not "assure safety". Rather, quality assurance to ensure the necessary standardization of the systems within NESMA AIRLINES to reduce the risk of accidents.

iii. QAS contains procedures for monitoring the performance of all aspects and ensures that the organization's / suppliers have appropriate quality assurance systems in place, including such elements as:

- Well designed and documented procedures (e.g. SOPs)
- Inspection and testing methods;
- Monitoring of equipment and operations;
- Internal and external audits;
- Monitoring of corrective actions taken; and
- The use of appropriate statistical analysis, when required

iv. Quality management system (QMS) has been established in many segments of the aviation system for a long time. A QMS defines and establishes an organization's quality policy and objectives. It ensures that the organization has in place those elements necessary to improve efficiency and reduce service-related risks. If properly implemented, a QMS ensures that procedures are carried out consistently and in compliance with applicable requirements that problems are identified and resolved and that the organization continuously reviews and improves its procedures, products and services. QMS should identify problems and improve procedures in order to meet corporate objectives.

v. The objective of SMS is to identify the safety hazards the organization must confront - and that in many cases it generates - during delivery of services, and to bring the safety risks of the consequences of these hazards under organizational control. In broad terms, the first imperative of this objective - hazard identification - is accomplished through the safety risk management component of an SMS, which is based upon safety management principles and practices. The second imperative -bringing the safety risks under organizational control - is accomplished through the safety assurance component of an SMS, which is based upon the integration of safety and quality management principles and practices.

vi. SMS differs from QMS in that:

- SMS focuses on the safety, human and organizational aspects of an organization (i.e. safety satisfaction); while
- QMS focuses on the product(s) and service(s) of an organization (i.e. customer satisfaction).

vii. The relationship between SMS and QMS

It is accurate to say that SMS and QMS share many commonalities they both:

- Have to be planned and managed;
- Depend upon measurement and monitoring;
- Involve every function, process and person in the organization; and
- Strive for continuous improvement.

viii. Once commonalities and differences between SMS and QMS have been established, it is possible to establish a synergistic relationship between both systems. It cannot be stressed strongly enough that the relationship is complementary, never adversarial, and it can be summarized as follows:

- SMS builds partly upon QMS principles;
- SMS should include both safety and quality policies and practices; and

- The integration of QMS into SMS provides a structured approach to monitor that processes and procedures to identify safety hazards and their consequences, and bring associated safety risks in aviation operations under the control of the organization function as intended and, when they do not, to improve them.

ix. The application of QA principles to safety management processes helps ensure that the requisite system-wide safety measures have been taken to support the organization in achieving its safety objectives. However QA cannot, by and in itself and as proposed by quality dogma, assure safety. It is the integration of QA principles and concepts into an SMS under the safety assurance component that assists an organization ensuring the necessary standardization of processes to achieve the overarching objective of managing the safety risks of the consequence(s) of hazards the organization must confront during the activities related to the delivery of services.

3.1.3 Safety oversight:

The monitoring functions of safety oversight take many forms with varying degrees of formality. NESMA AIRLINES employs the first-line supervisors and quality staff to maintain vigilance (from a safety perspective) by monitoring the day-to-day activities as follows:

i. They regularly conduct inspections (formal or informal) of day-to-day activities in all safety - critical areas.
ii. They sample employees' views on safety (train both a general and a specific point of view) through safety surveys.
iii. They systematically review and follow up on all reports of identified safety issues.
iv. They systematically capture data which reflect act vial day-to-dayperformance such as FDA,
v. They follow a regular operational audit program (including both internally and externally conducted safely audits).
vi. They communicate safety results to all affected personnel.

3.1.4 Surveys/surveillance checks:

i. Surveys/surveillance checks of NESMA AIRLINES operations and facilities can provide management with an indication of the levels of safety and efficiency, Understanding the systemic hazards and inherent risks associated with everyday activities allows NESMA AIRLINES to minimize unsafe acts and respond proactively by improving the processes, conditions and other systemic issues that lead to unsafe acts.
ii. Safety surveys/surveillance checks are the ways to systematically examine particular elements or the processes used to perform a specific operation either generally or from a particular safety perspective, they are particularly useful in assessing attitudes of selected populations.
iii. Surveys/surveillance checks are usually independent of routine inspections by government or company management. Surveys/surveillance checks completed by operational personnel can provide important diagnostic information about daily operations and significant information regarding many aspects of the organization, including:

- Perceptions and opinions of operational personnel;
- Level of teamwork and cooperation among various employee groups;
- Problem areas or bottlenecks in daily operations;

- Safety culture;
- Current areas of dissent or confusion,

iv. Safety surveys/surveillance checks may involve the use of:

- Checklist,
- Questionnaires.
- Informal confidentiality reviews.

v. The validity of all survey/surveillance checks information obtained may need to be verified before corrective action is taken. Similar to voluntary incident.

3.2 Safety Performance Measurement Program

3.2.1 General:

Setting performance measures in support of Nesma Airlines safety objectives is an element of the Safety Assurance component of the SMS framework.

By setting performance measures, the company is able to track and compare its operational performance against a target (i.e. the performance objective, typically expressed as a rate or number reduction) over a period of time (e.g. one year). Achievement of the target (or objective) would represent an improvement in the operational performance. The use of performance measures is an effective method to determine if desired safety outcomes are being achieved, and to focus attention on the performance of the organization in managing operational risks and maintaining compliance with relevant regulatory requirements.

In addressing operational performance, meaningful measures typically focus on lower level (i.e. lower consequence) occurrences or conditions that are considered by the company to be precursors to serious events. Performance measures may be specific to a certain area of operations or may be broad and apply to the entire system.

In addressing compliance, meaningful measures, as a minimum, would focus on compliance with significant regulatory requirements (as determined by the company) in all operational areas.

Ideally, performance measures are designed to be challenging, which, in turn, enhances the effectiveness of the risk management system.

3.2.2 Safety health:

The term safety health is an indication of Nesma Airlines resistance to unexpected conditions or acts by individuals. It reflects the systemic measures put in place by Nesma Airlines to defend against the unknown. Furthermore, it is the indication of Nesma Airlines stability to adapt to the unknown. In fact, it reflects the safely culture of Nesma Airlines.

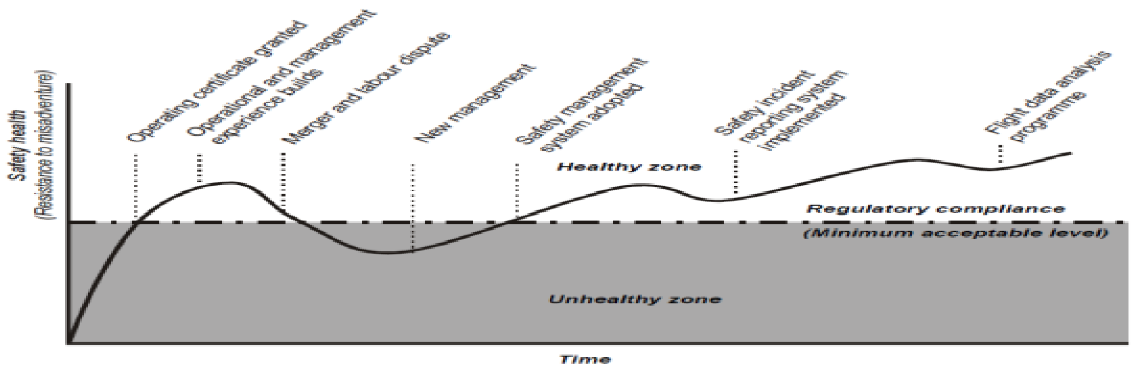
Although the absence of safety-related events (accidents and incidents) does not necessarily indicate a "safe" operation, some operations are considered to be "safer" than others, Safety deals with risk reduction to an acceptable (or at least a tolerable) level. The level of safety in an organization is unlikely to be static.

Adding defences against safety hazards, safety health may be considered to be improving. However, various factors (hazards) may compromise that safety health, requiring additional measures to strengthen the organization's resistance to misadventure.

3.2.3 Assessing safety health

Nesma Airlines set indicators for assessing safety performance in order to improve safety health; through:

- Implementing measures to increase its resistance to the unforeseen. They consistently do more than just meet the minimum regulatory requirements.
- Identifying the symptoms may provide a valid impression of Nesma Airlines safety health, however, information may still be lacking for effective decision-making. Additional tools are required to measure safety performance in a systematic and convincing way.



3.2.4 Symptoms of poor safety health

Poor safety health may be indicated by symptoms that put elements of the organization at risk. A weakness in any one area may be tolerable; however, weaknesses in many areas indicate serious systemic risks, compromising the safety health of the organizations as follows:

- Inadequate organization and resources for current operations;
- Instability and uncertainty due to recent organizational change;
- Poor financial situation;
- Unresolved labour-management disputes;
- Record of regulatory non-compliance;
- Low operational experience levels for type of equipment or operations; Fleet inadequacies such as age and mix;
- Poorly defined (or no) corporate safety function;
- Inadequate training programmes;
- Corporate complacency regarding safety record, current work practices, etc.; and
- Poor safety culture

3.2.5 Improving safety health

- Proactive corporate safety culture;
- Investment in human resources in such areas as non-mandatory training;
- Formal safety processes for maintaining safety database, incident reporting, investigation of incidents, safety communications, etc.;
- Operation of a comprehensive safety management system (i.e. appropriate corporate approach, organizational tools and safety oversight);
- Strong internal two-way communications in terms of openness, feedback, reporting culture and dissemination of lessons learned; and
- Safety education and awareness in terms of data exchange, safety promotion, participation in safety fora, and training aids.

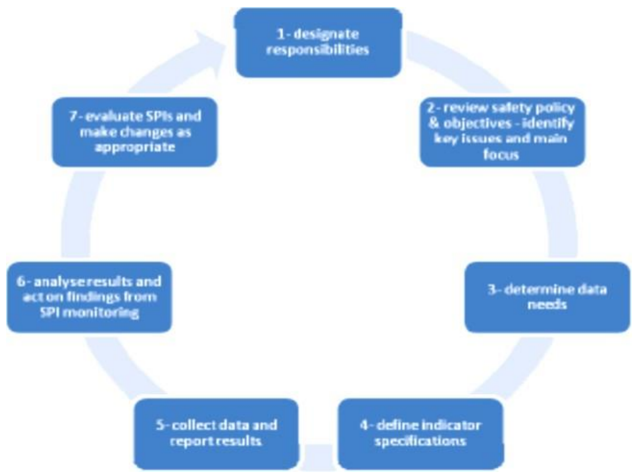
3.2.6 Statistical safety performance indicators

- Statistical safety performance indicators can be focused on specific areas of the operation to monitor safety achievement, or on identifying areas of interest. This approach is useful in trend analysis, hazard identification, risk, as well as in the choice of risk control measures.
- Since accidents (and serious incidents) are relatively random and rare events in aviation, assessing safety health based solely on statistical safety perform an indicator may not.

- provide a valid predictor of safety performance, especially in the absence of reliable exposure data. Reviewing the past does little to assist in their quest to be proactive and to put in place those systems most likely to protect against the unknown.

3.2.7 Nesma Airlines Safety performance measurement process

As with anything that relates to effective safety management, defining and using safety performance indicators must be a dynamic process. A step-by-step process for developing our company set of safety performance indicators is proposed, which follows the ‘Plan-Do-Check-Act’ logic for continual improvement.
The following process should be applied by all company department for safety performance measurement implementation.



1) <u>Designate responsibilities</u>

It is critical to the success of the SPI project, as to the SMS journey in general, each department management or delegated personnel are fully committed to implementing SPIs as a fundamental part of our company’s safety management approach. Rather than just supporting a system of SPIs, department management in coordination with the safety & quality department will define the aspects that require measurement and management will apply a systematic approach to managing those elements, in accordance with the company safety policy and defined safety objectives.
Management should be kept informed of progress on a regular basis and should take an active role in steering the process of implementing SPIs.

2) <u>Review safety policy and objectives – identify key issues and main focus</u>

To define indicators for specific operational safety issues, the company hazard identification tools and the departmental operational needs should be used to determine the safety actions and risk barriers that would be most suitable for the definition of operational indicators. A thorough hazard identification will be required as part of our system analysis to provide a good understanding of threats to safety in our operations.

3) <u>Determine data needs</u>

To be meaningful, measures of performance must be based on reliable and valid data, both qualitative and quantitative. Therefore, the department responsible personnel should identify all pertinent data and information that is available within the department and determine what.
additional information is needed. It should also consider information available through the internal audit/compliance monitoring system.

The department may be tempted to identify things that lend themselves to being measured instead of identifying what you should measure. This is likely to result in identifying SPIs that are most obvious and easy to measure rather than SPIs that are most valuable for effective safety management. Therefore, at this step of the process, it is important to focus on what changes Nesma Airlines wants to 'drive' and what aspects it needs to 'monitor.' The department should also consider that, to be effective at assessing system safety, a broad set of indicators involving key aspects of our system and operations should be developed; this will reduce the possibility of having a narrow and therefore potentially flawed view of the company safety performance.

4) Define indicator specifications

Once the scope and focus of department SPIs have been determined and available data/information reviewed, the specifics need to be defined. Each SPI should be accompanied by sufficient information (or data) which enables any user to determine both the source and quality of the information, and place this indicator in the context necessary to interpret and manage it effectively.

Whenever possible, indicators should be quantitative, as this facilitates comparison and detecting trends. Quantitative metrics should be precise enough to allow highlighting trends in safety performance over time or deviations from expected safety outcomes or targets.

For qualitative SPIs, it is important to minimize subjectivity. This may be achieved through an evaluation by members of staff not directly involved in the definition of SPIs.

Aspects of good SPIs include:

The indicator is:

- valid and reliable,
- sensitive to changes in what it is measuring, and
- not susceptible to bias in calculating or interpretation.
- Capturing the data is cost effective.

The indicator is:

- broadly applicable across department operations, and
- easily and accurately communicated.

5) Collect data and report results

Once the department have defined its SPIs, each department will decide how it will collect the data and report the results. Data collection approaches (i.e., data sources, how data will be compiled, and what the reports will look like), as well as roles and responsibilities for collection and reporting, should be assigned. Data collection procedures should also consider the frequency with which data should be collected and the results reported for each SPI. Some of these issues will have been addressed when deciding on the SPIs in steps 3 and 4.

The presentation format of the indicator results should take into account the target audience. For example, if you track several indicators addressing the same key issue, it may be useful to identify a subset of the most critical indicators to be given greater emphasis for reporting to top management. The presentation of indicator results should facilitate understanding of any deviations and identification of any important trends (e.g., scoreboards with traffic lights, histograms, linear graphs).

6) Analyse results and act on findings from SPI monitoring

This is the most relevant step in terms of safety management, as the ultimate goal of implementing SPIs is to maintain and improve the department safety performance over time. There is no point in collecting information if the results are not used. Remember that SPIs are indicators of safety performance, not direct measures of safety. The information collected through different SPIs needs to be carefully analysed, and SPIs collected for different issues need to be put in perspective and the results interpreted, so as to gain an overall picture of the organization's safety performance. The results obtained through an individual indicator may be insignificant if taken in isolation, but may be important when considered in combination with other indicators.

Inconsistencies between SPIs may be an indication of an inaccurate system description or problems with the SPIs themselves. For example, you may encounter situations where leading and lagging indicators associated with the same safety issue provide contradictory results or where a positive trend in systemic indicators goes with a negative trend in operational indicators.

If you find that the metrics are not defined well enough to capture safety critical information the SPIs should be reviewed. Any inconsistencies in the overall picture represent a potential

Indicators should not be simply seen as a metric, with actions being taken to get a good score rather than to improve safety performance. It is important that results obtained through the collection, analysis and interpretation of SPIs are conveyed to your management for decision and action. Ideally, these results should be presented at regular meetings (e.g., safety review board meetings) to determine what actions are required to address deficiencies or to further improve the system. It is important that such actions do not focus on certain indicators in isolation, but on optimizing company overall safety performance.

7) <u>Evaluate SPIs and make changes as appropriate</u>

The systems analysis of your organization, along with the set of SPIs and their specifications, including the metrics and any defined targets, should be periodically (once every year) reviewed and evaluated to consider:

- The value of experience gained,
- New safety issues identified,
- Changes in the nature of risk,
- Changes in the safety policy, objectives; and priorities identified,
- Changes in applicable regulations, and
- Organizational changes, etc.

Periodic reviews will help to ensure that the indicators are well defined and that they provide the information needed to drive and monitor safety performance.

The departments will liaise with safety department to ratify SPT and to identify additional SPI that maintain awareness of hazards and acceptable levels of risk as business activities evolve.

3.2.8 Nesma Airlines safety performance indicators examples

3.2.8.1 High consequences SPI's:

- Rate of serious incidents and accidents per 1000 FH
- Rate engine IFSD incident rate per 1000 FH

3.2.8.2 Low consequences SPI's:

Safety & Quality SPI's

- Mandatory Occurrence Report (MOR) rates
- Number of safety reports submitted which reflects a positive reporting culture.
- Safety & quality Audit Program –specifically measuring:

The number of audits completed against program requirements
The number of findings.
The level of findings.

- IOSA conformance levels.
- SMS training plan completion.
- SAFA findings ratio

Operations SPI's

- Flight data monitoring program events, the number of flight data events detected vs. the severity of those events as detected by the flight data analysis program.

Cabin SPI's

- Cabin crew evaluation program
- Emergency equipment checks completion,
- Cabin crew training plan completion,
- A slide is inadvertently deployed.

OCC SPI'S

- Incorrect movement format and/or data
- Flight following sheet missing data
- Operational activities

Ground Handling SPI's

- Exceeding loading height limitations
- FOD
- Loading officer not stack with (SOP) during loading
- Brakes check before entry on aircraft
- Loading Aft. first
- Fuel Spillage

Maintenance SPI's

- Technical record data entry
- MCC availability percentage
- Planning work request
- Aircraft log book filling mistakes percentage
- Executed task card signed
- Reliability reports read out

3.2.9 Nesma Airlines safety performance target are:

Nesma Airlines safety performance targets are detected and should be achieved as follows:

- The selection of the safety performance indicators.
- Measuring the performance of the selected indicators.
- Performing a risk assessment that includes mitigations, identify actions required and implement these actions.
- A measurable target for each selected indicator performance measurement is established based on mitigations set and actions to be implemented.
- After setting the target and applying the actions required, another measurement is done to monitor their effects on reducing the number of cases caused by operations and to verify the measurable target achievement.
- A continuous improvement for safety targets will require to repeat the above procedure by setting better targets and/or adding new indicators.
- The following are an examples for the targets that may be selected and set on a measurable base:
  - Continual reduction of high risk and/or severe incidents (occurrences reports)
  - To reach and maintain 100% IOSA compliance.
  - To conduct a Line Operational Safety Audit (LOSA) at least once every 4 years.
  - Reduction in the percentage of SAFA findings ratio.

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3.3 Safety Audit

3.3.1 General: (Ref to Quality Assurance Program Corporate Manual ch.3)

i. Safety auditing is one of NESMA AIRLINES core safety management activities. Similar to financial audits, safety audit provide a means for systematically assessing how well the organization is meeting its safety objectives. The safety audit program, together with other safety oversight activities (safety performance monitoring), provides feedback to managers of individual units and senior management concerning the safety performance of NESMA AIRLINES. This feedback provides evidence of the level of safety performance being achieved.

ii. Safety auditing is a proactive safety management activity, providing a means of identifying potential problems before they have an impact on safety.

iii. Safety audits may be conducted internally or by an external safety auditor. Demonstrating safety performance for State authorities is the most common form of external safety audit. Increasingly, however, other stakeholders may require an independent audit as a precondition providing a specific approval, such as for financing, insurance, partnerships with other airlines, and entry into foreign airspace. Regardless, the activities and products from both internal and external audits are similar.

iv. Safety audits should be conducted on a regular and systematic basis.

3.3.2 NESMA AIRLINES safety audits will be done according to an audit plan which integrates safety and quality audits.

3.3.3 Self-Audit:

i. Critical self-assessment (or self-audit) is a tool that NESMA AIRLINES management can employ to measure safety margins. This self-audit checklist is designed for use by senior management to identify organizational events, policies, procedures or practices that may be indicative of safety hazards.

ii. There is no right or wrong answers in all situations, nor are all the questions relevant to all types of operations. However, the response to a certain line of questioning may help reveal NESMA AIRLINES safety health.

3.3.4 Safety Audit Process:

i. NESMA AIRLINES Safety audits are used to ensure that:

- The structure of the SMS is sound in terms of appropriate levels of staff; compliance with approved procedures and instructions; and a satisfactory level of competency and training to operate equipment and facilities and to maintain their levels of performance.
- Effective arrangements exist for promoting safety, monitoring safety performance and processing safety issues.
- Adequate arrangements exist to handle foreseeable emergencies.

ii. Ideally, safety audits should be conducted yearly, following a cycle that ensures each functional area is audited as a part of the organization's plan for evaluating overall safely performance.

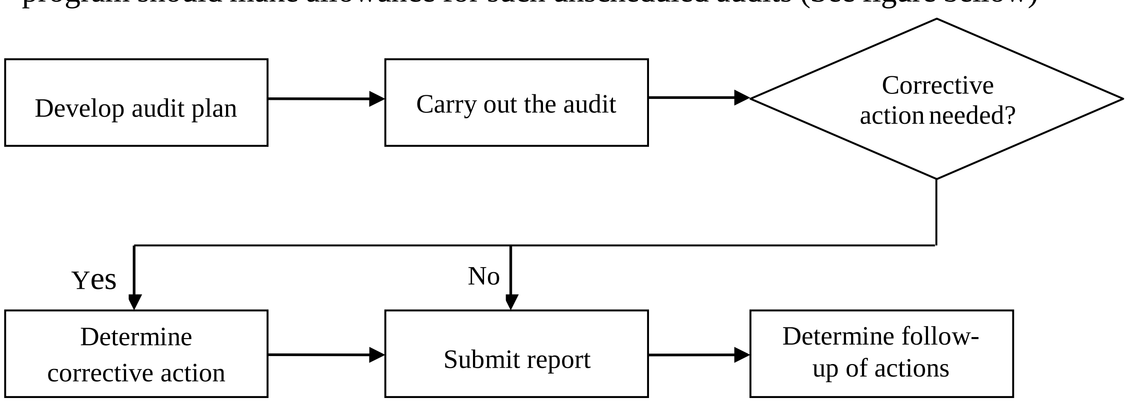
iii. Safety audits should entail a periodic detailed review of the safety Performance, procedures and practices of each concerned area.

iv. Safety audits should go beyond just cheeking compliance with regulatory Requirements and conformance with standards. The audit team should assess whether the procedures in use arc appropriate and whether there are any work practices that could have unforeseen safety consequences.

v. For successful audit, the cooperation of the personnel of area concerned is essential. The safety audit program should be based on the following principles:

- It must never appear to be a "witch hunt"; the objective is to gain knowledge. Any suggestions of blame or punishment will be counter productive.
- The audits should make all relevant documentation available to the auditors and arrange for staff to be available for interview as required,
- Facts should be examined in an objective manner.
- A written audit report describing the findings and recommendations should be presented to the area within one month.
- The staff as well as the management should be provided with feedback concerning the findings of the audit.
- Positive feedback should be provided by highlighting in the report the good points observed during the audit,
- While deficiencies must be identified, negative criticism should he avoided as much as possible.
- The need to develop a plan to resolve deficiencies should be required.

Following an audit, a monitoring mechanism may be implemented to verify the effectiveness of any necessary corrective actions. Follow-up audits should concentrate on aspects of the operations where the need for corrective action was identified. Audits to follow up previous safety audits where corrective action was proposed or because an undesirable trend in safety performance was identified cannot always be scheduled in advance. The overall annual audit program should make allowance for such unscheduled audits (See figure bellow)



The safety audit process:

Refer to Corp. Manual, Chapter 3 (Quality Assurance Program for Audit Process).

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3.4 The Management of Change

3.4.1 General

Hazard identification and risk assessment are not statistic. They need to be performed continuously, a safety assessment should be undertaken prior to the implementation of any major change potentially affecting the safety of NESMA AIRLINES operations in order to demonstrate that the change meets an acceptable level of safety, and that is why NESMA AIRLINES needs safety assessment in change management?

3.4.2 Change Management

i. **Changes can:**
- Introduce new hazards.
- Impact the appropriateness of risk mitigation.
- Impact the effectiveness of risk mitigation

ii. **External changes**
- Change of the regulatory requirements
- Security
- Re-organization of air traffic control
- Re-organisation of an airport

iii. **Internal changes**
- Organization change
- New equipment.
- New procedures.
- New operation
- Fleet expand

3.4.3 Safety assessment

i. Whenever any of the above events is contemplated at NESMA AIRLINES, the Safety & Quality Department will coordinate with the concerned department to conduct hazard identification and risk assessment The Safety & Quality Department will be involved in the process at each stage.

ii. If the result of an assessment is that the system under review does not satisfy the safety assessment criteria, it will be necessary to find some means of modifying the system in order to reduce the risk. This process is called risk mitigation. The development of mitigation measures becomes an integral part of the assessment process. The adequacy of proposed mitigation measures should be tested by re-evaluating what the risk would be with the mitigation measures in place.

iii. The process of safety assessment aims to answer the following three fundamental questions:
- What could go wrong?

- What would be the consequences?
- How often is it likely to occur?

iii. The entire process, including the mitigation measures to be implemented, documented in Change Management form (no. 355) and to be signed by the concerned Manager/Director.

iv. For the managers to be able to make an informed decision concerning this, the safety assessment must be well documented. The documentation should he retained to provide a record of the basis in which the acceptance decision was made.

v. NESMA AIRLINES formal change process should:

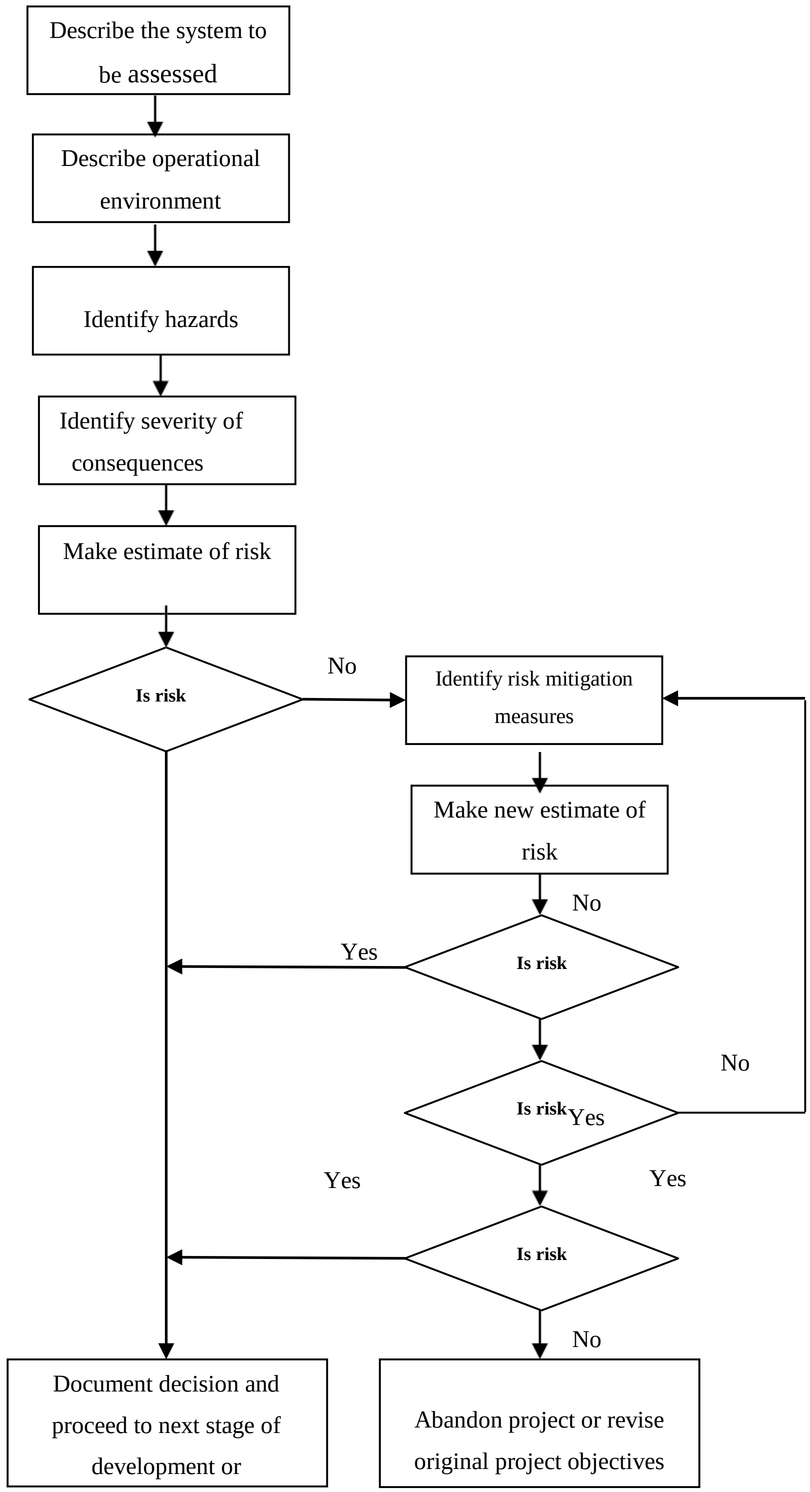
- Identify requirements as to when safety assessments must be performed;
- Develop procedures for performing safety assessments;
- Develop organizational risk classification criteria for identified hazards;
- Develop acceptance criteria for safety assessments: and
- Develop documentation requirements and processes for retaining and disseminating safety information acquired through the assessments.

3.4.4 NESMA AIRLINES safety assessment process

i. The perceived risk associated with hazardous event depends on the two dimensional concept of risk, to define the (**Like hood**) of occurrence of the event, and the (**Severity**) of its consequences. The safety assessment process addresses both these factors. Safety assessments are particular application of the risk management process,

ii. The safety assessment process can be divided into (**Seven steps**) as outlined in the figure below, and shows the possible need to perform a number of cycles of the process until a satisfactory method of risk mitigation is found:

- **Step 1:**Development (or procurement) of a complete description of the system to be evaluated and the environment in which the system is to be operated;
- **Step 2 :** Identification of-hazards;
- **Step 3 :** Estimation of the severity of the consequences of a hazard occurring;
- **Step 4 :** Estimation of the like hood of a hazard occurring;
- **Step 5 :** Evaluation of risk;
- **Step 6 :** Mitigation of risk;
- **Step 7:** Development of safety assessment documentation.



The safety assessment process

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3.5 Continues Improvement of Safety System

3.5.1 Purpose of continues improvement of safety

Continuous improvement at NESMA AIRLINES safety system aims at:

i. Determining the immediate causes of below standard performance and their implication in the operation of the SMS
ii. Rectifying situations involving below standard performance identified through safety assurance activities

3.5.2 NESMA AIRLINES shall achieve continuous improvement of safety through:

i. **Proactive** evaluation of facilities, equipment, documentation and procedure; through audits and surveys
ii. **Proactive** evaluation of the individual's performance, to verify the fulfilment of their safety responsibilities.
iii. **Predictive** for identifying operational ascendances and confirming normal operating procedures
iv. **Reactive** evaluation in order to verify the effectiveness of the system for control and mitigation of risks, e.g.:

- Accidents
- Incidents
- Major events investigations,

3.5.3 Using checklists

NESMA AIRLINES shall use checklists consist of a comprehensive series of questions grouped under topic headings, which are used to ensure that all relevant topics are covered. Checklists should address the following areas in an organization:

i. National safety regulatory requirements;
ii. NESMA AIRLINES safety policies and standards,
iii. Structure of safety accountabilities;
iv. Documentation, such as:

- Safety management manual SMM

- Operational documentation, (including its local instructions)

v. Safety culture (reactive or proactive)

vi. Hazard identification and risk management processes

vii. Safety oversight capabilities (inspections, audits, etc.)

viii. Provisions for assuring safety performance of contractors.

3.5.4 Safety information gathering techniques

NESMA AIRLINES techniques for gathering safety information on which the audit team's assessment will be made shall include:

i. Review of documentation;

ii. Interviews with staff

A way to obtain information is by asking questions. This method provides additional information to that available in written material. It also gives the staff involved an opportunity to explain the system and work practices. Face-to-face discussions also permit the auditors to assess the level of understanding as well as the degree of commitment of the staff of the area to safety management. The persons to be interviewed should be drawn from a range of management, supervisory and operational positions. The purpose of audit interviews is to elicit information, not to enter into discussions.

iii. Observations

Once the audit activities are completed, the audit team should review all audit observations and compare them against the relevant regulations and procedures in order to confirm the correctness of observations noted as nonconformities, deficiencies or safety shortcomings.

NESMA AIRLINES is going to use all tools available in this manual according to implementation phases.

Chapter (4)
Safety Promotion

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Part (4) – Table of Content		
S/N	**Chapter Section**	**Chapter Name**
1	**Chapter 4.1**	Training and Educations
2	**Chapter 4.2**	Safety communication
3	**Chapter 4.3**	Human Factors

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4.1 Training and Education

4.1.1 Introduction

Safety Promotion is necessary to ensure that Nesma Airlines is fully understands and trusts The SMS policies procedures, and structure. This will be achieved by establishing a culture of safely, training all staff in safety principles, and allowing open communication of safety issues.

4.1.2 Culture

The main goal of safety promotion is to create a "safety culture". Having a safety culture means that all staff are responsible for safety. Such a culture is led by top management, especially in the manner with which they deal with day-to-day activities. All personnel must fully trust that they will have management support, for decisions made in the interest of safety, while also recognizing that intentional breaches of safety will not be tolerated the result is a non-punitive environment that encourage; the identification, reporting, and correction of safety issues.

4.1.3 Safety Management System Training

Nesma Airlines safety culture is tied to the success of its safety management training program. All personnel must understand Nesma Airlines safely philosophy, policies, procedures and practices. They must understand their roles and responsibilities within that safety management framework. Safely training should begin with a personnel's initial basic course and continue through his employment by recurrent course every 36 months as per ECAR 19. Specific safety management training should be provided for stalls who occupy positions with particular safety responsibilities. The training program should ensure that the safety policy and principles of the Nesma Airlines are understood and adhered to by all stall, and that ail staff are aware of the safety responsibilities of their position.

4.1.4 Nesma Airlines Training Program

i. The safety & quality department should, in conjunction with the company department, review the job descriptions of all staff, and identify those positions that have safety responsibilities. The details of the safely responsibilities should then be added to the job descriptions.

ii. Once the job descriptions have been updated, the safety & quality department, should conduct a training needs analysis, to identify the training that will be required for each position.

iii. The level of safely management training required will vary from general safety familiarization, to expert level for safety specialists; as follows:

- Corporate training for all staff.
- Training aimed at management's safety responsibilities;
- Training for operational personnel (pilots, cabin crews, maintenance technicians, ramp personnel, etc.);
- Training for aviation safely specialists.

During the initial implementation of a safety management system, specific training will have to be provided for existing staff once the safety management system is fully implemented, the safety training needs for other than the safety specialists should be met by incorporating the appropriate safety content into the general training program for each position.

4.1.4.1 Basic introductory safety training

One of the functions of safety management training is to create awareness of the objectives of the safety management system of Nesma Airlines, and the importance of developing a safely culture. All staff (management and non-management personnel) may receive a basic introductory course covering the following issues:

i. Basic principles of safety management;
ii. Corporate safety philosophy, safety policies and safety standards (including corporate approach to disciplinary action, safety issues, integrated nature of safety management, risk management decision making, safety culture, etc.);
iii. Importance of complying with the safety policy and with the procedures that form part of the safety management system;
iv. Organization, rules and responsibilities of staff in relation to safety:
v. Corporate safety record, including discussion of areas of systemic weakness;
vi. Corporate safety goals and objectives;
vii. Corporate safety management programs;
viii. Requirement for ongoing internal assessment of organizational safety performance (employee surveys, safety audits and assessments);
ix. Reporting accidents, incidents and perceived hazards;
x. Lines of communications for safety matters;
xi. Feedback and communication methods for the dissemination of safety information;
xii. Safety audits and reviews;
xiii. Safely promotion and information dissemination.

4.1.4.2 Training for safety managers (Ref. ECAR 19)

The person selected as the safety & quality director needs to be familiar with most aspects, its activities and personnel. These requirements may be met in-house, or from external courses, for the safety manger training requirements, please refer to ECAR 19.

4.1.4.3 Training for management team

Training for management team of the safety management system and their responsibilities and accountabilities for safety, it is essential that the management team understands the principles on which the safety system is based. Training must ensure that managers and supervisors are familiar with the principles.
The SMS Line Management course for line management staff:
Initial Line Management SMS Course for 40 hours and the recurrent course will be conducted once every 36 months

4.1.4.4 Training for safety specialist

A number of safety related tasks require specially trained personnel, it is important that staff performing these functions receive adequate training in the special methods and techniques involved. Depending upon the depth of training required and the level of existing expertise in Safety management within Nesma Airlines, it may be necessary to obtain assistance from external specialists in order to provide this training; that include, but not limited to:

i. Basic Safety Management System “Line Management Course including risk management for 40 hours, recurrent course every 36 month,

ii. FDM Program Awareness sessions.
iii. Safety Specialists are:
   1. Safety & Quality Director
   2. Quality Assurance Manager.
   3. Flight Safety Manager

4.1.4.5 Safety training for operational personnel

In addition to the corporate indoctrination outlined above, personal engaged directly in-flight operations (Flight crews, cabin crews, maintenance technicians, etc.) will require more specific safety training with respect to:

i. Procedures for reporting accidents and incidents:
ii. Unique hazards facing operational personnel;
iii. Procedures for hazard reporting;

The line operations staff (flight crew, flight dispatchers, cabin crew, maintenance staff and ground handling staff) will take the initial and recurrent SMS courses internally by the company ECAA approved instructor.
The recurrent training for the line operations staff will be conducted once every 36 months.
As per ECAA approval, SMS recurrent courses for the flight crew and cabin crew will be conducted through the E- Learning System.
The line operations course durations will be as follows:
- 8 hours for initial course
- 6 hours for recurrent course

4.1.4.6 All staff course

Safety awareness session with a duration of 4 hours and the recurrent course once every 36 months.

4.1.4.7 SMS Instructor training requirements

To serve as a Safety Management System Instructor
(a) Holds a high academic degree
(b) Work in aviation Safety/Quality field at least 2 years.
(c) Work in aviation operational area at least 5 years

Training: as stated in the following
Phase one:
(a) Successfully Completed Safety Fundamentals course
(b) Successfully Completed SMS implementation and control course
(c) Successfully Completed Safety Risk Management Course

Phase two:
(a) Successfully Completed Train the Trainers course.
(b) Instructs at least one approved Safety Fundamentals Course (SMS for All Staff) under the supervision of an approved SMS instructor from the ECAA.

Recurrent Training: Required Recurrent Courses Each 24 Months or working in SMS field or instructs any two SMS courses each year.

4.1.4.8 Training modules for initial & recurrent courses

Module	Line Management & Safety Specialist	Line Operational	All Staff
Safety philosophy, safety policies and safety standards	X	X	X
Organization safety roles and responsibilities of staff	X	X	X
Corporate Safety Goals and Objectives	X	X	X
Hazard Identification & Risk Management	X	X	
Incidents Accidents & Hazard Reporting	X	X	
Safety Assurance Programs	X		
Management of Change	X		
Coordination of the Emergency Response Plan	X		
Safety Performance Monitoring	X		
Safety Promotion and Information Dissemination	X		
Role of contracted service providers in SMS	X		

*Any new issued safety materials will be briefed to the attendees of recurrent courses.

4.1.4.9 Training procedure

The safety & quality department will set the course content and syllabus of the SMS training courses and this to be approved by ECAA through SMSM acceptance. All lesson plans and medium of delivery of the courses is maintained by the safety & quality department. Line managers shall nominate staff for SMS training depending on the requirements of their job.

4.1.4.10 SMS training competency and assessment

Any course is aimed at adding proficiency of competency to a student to be able to conduct a certain skill. The means of assessment in the SMS course will take place at the end of the course as follows:

- Evaluation of sample SMS scenarios and development of solutions.
- Problem based questions
- Role-play in facilitating a review of a SMS.
- Observations
- Demonstration of technique

SMS courses evaluation and assessment for the line operation staff is conducted either by hand writing exam after the course or through an online exam for the trainee using the E-learning System.

4.1.4.11 Training Records

On successful completion of initial and recurrent training, the training records are retained by the safety department and each operational department involved. The retention period for the initial course is permanent and the recurrent courses upon renewal.

4.1.5 Service Providers SMS training Program:

The program purpose is to ensure service provider personnel especially individual involvement in the Nesma Airlines SMS are trained in a manner that satisfies Nesma Airlines requirements, and that the service provider SMS training program is consistent with and meets the requirements of its own SMS.

4.1.5.1 Contracting phase:

Contract/agreement production/execution with external service providers will be comprise multiple parts, including the basic document that sets forth legal and commercial terms, and a charter that committed the service provider to comply with Nesma Airlines safety and quality principles including SMS training requirements.

4.1.5.2 Reviewing the service provider SMS training program

After contract execution, the safety department in coordination with the training department will review the service provider SMS training program as a part of the training committee meetings to determine and select one of the following options: The service provider has an SMS that fully comply with Nesma Airlines SMS requirements and acceptable to the committee;

- The service provider has an SMS that partially comply with Nesma Airlines SMS requirements, the committee will specify training in addition to that of the service provider (i.e. gap training) to ensure its own SMS requirements are satisfied;
- Nesma Airlines will send the required curriculum and training material to the service provider to conduct the training, or will deliver targeted or specific SMS training to personnel of service providers;

Accordingly, service providers SMS training may be conducted by Nesma Airlines, or by the service provider or other organization as long as the content and delivery of such training satisfies the SMS requirements of Nesma Airlines.

4.1.5.3 Service Provider SMS Training Curriculum

The content of training for service providers would be appropriate and applied to individual responsibilities and involvement in the Nesma Airlines SMS. Such training and will include or address the following subject areas, as appropriate for the operational functions performed by the personnel for Nesma Airlines.

- Organizational safety policies, goals and objectives;
- Organizational safety roles and responsibilities related to safety;
- Basic Hazard identification and safety risk management principles;
- Safety reporting systems;
- Safety management support (including evaluation and audit programs);
- Lines of communication for dissemination of safety information;
- A validation process that measures the effectiveness of training;
- Initial indoctrination and, when applicable, recurrent training requirements.

4.1.5.4 Training for Service Provider (Ref. to ECAR 19)

Nesma Airlines shall conduct service provider audit to assure that:

a) The service provider shall develop and maintain an initial safety training program that ensures that personnel are trained and competent to perform their SMS duties.
b) The service provider shall conduct recurrent training at least once per 36 months in case of the recurrent training intervals is not stated at other operational regulations.

4.2 Safety Communication

4.2.1 Introduction: (Ref. to Corporate Manual Ch.1)

Individual safely training is supplemented by an on-going two-way communication process that helps ensure that personnel benefit from safety lessons learned, see the results of their actions, and continue to improve their understanding of NESMA AIRLINES's SMS. When safety recommendations or new procedures are introduced, the associated underlying safely analysis should also be communicated to the appropriate staff (flight crew, cabin crew and maintenance personnel, etc.). In addition to written communications, it is important for employees to witness evidence of the commitment of top management to safety.

4.2.2 Publication

NESMA AIRLINES's safety policies, procedures, newsletters and bulletins alone will not necessarily bring about the development of a positive safety culture. While it is important that staff be well informed, it is also important that they see evidence of the commitment of management to safety. The attitudes and actions of management will therefore he a significant factor in the promotion of safe work practices and the development of a positive safety culture,

4.2.3 Importance of safety communication:

NESMA AIRLINES believes that safety communication is an essential foundation for the development and maintenance of a positive safety culture. NESMA AIRLINES's Safety promotion activities are particularly important during the initial stages of the implementation of an SMS. However, safety promotion also plays an important role in the maintenance of safely, as it is the means by which safety issues are communicated within NESMA AIRLINES. These issues will be addressed through staff training programs.

4.2.4 Lessons learned:

In order to propose solutions to identified hazards, staff must be aware of the hazards that have already been identified and the corrective actions that have already been implemented. The safety promotion activities and training programs should therefore address the rationale behind the introduction of new procedures. When the lessons learned could also be significant to NESMA AIRLINES.

4.2.5 Aims of Safety communication:

NESMA AIRLINES's safety communication aims at:

- **i.** Ensure that all staff is fully aware of the SMS.
- **ii.** Convey safety critical information.
- **iii.** Explain why particular actions art; taken.
- **iv.** Explain why safety procedures are introduced or changed

4.2.6 Risk communication

i. Risk communication includes any exchange of information about risks, i.e. any public or private communication that informs others about the existence, nature, form, severity or acceptability of risks. The information needs of the following groups may require special attention:

- Management must be apprised of all risks that present loss potential to the organization.
- Those exposed to the identified risks must be apprised of their severity and likelihood of occurrence.
- Those who identified the hazard need feedback on action proposed.
- Those affected by any planned changes need to be apprised of both the hazards and the rationale for the action taken.
- Regulatory authorities, suppliers, industry associations, the general public, etc. have potential information needs regarding specific risks.
- The stakeholders can assist the decision-maker(s) if the risks are communicated early in a fair, objective and understandable way.

ii. Failure to communicate the safety lessons learned in a clear and timely fashion will undermine management’s credibility in promoting a positive safety culture. For safety messages to be credible, they must be consistent with the facts, with previous statements from management and with the messages from other authorities. These messages need to be expressed in terms the stakeholders understand.

4.2.7 Means of safety communication:

NESMA AIRLINES's means of safety communication are, but not limited to:

i. Spoken words, interviews (e.g. FDA noncompliance with SOP’s)

ii. Written words (safety policy and procedures. Newsletters, Bulletins, posters and Magazines).

iii. Safety Committee,

iv. NESMA AIRLINES's Website & personnel E-mail

4.3 Human Factors

4.3.1 Introduction:

i. Flight safety is a main objective of NESMA AIRLINES. A major contributor to achieve that objective is a better understanding of Human Factors and (In: broad application of its knowledge. Increasing awareness of Human factors in NESMA AIRLINES will result in a safer and more efficient working environment.

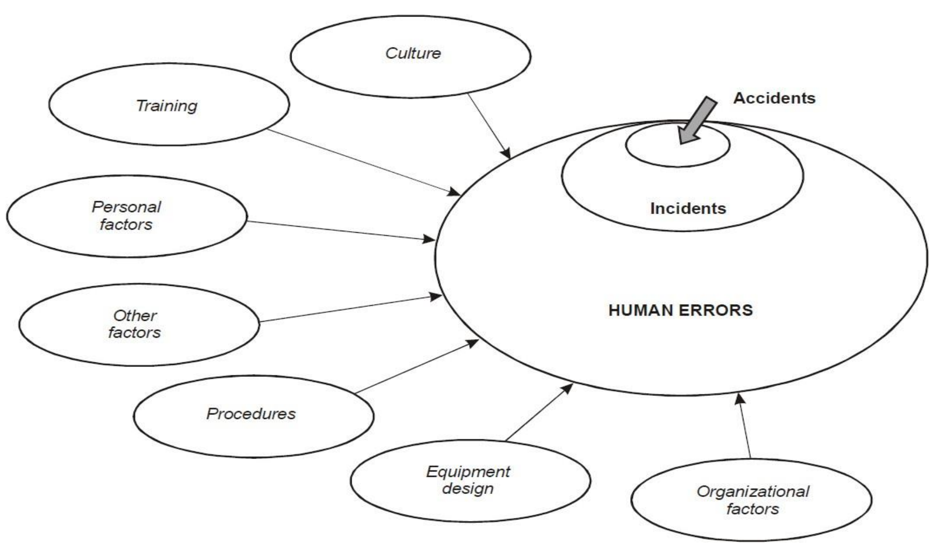
ii. The purpose of this Appendix is to introduce this subject and to provide guidelines for improving human performance through a butler understanding of the factors affecting it through the application of Crew Resource Management (CRM) concepts in normal and Emergency situations and through, understanding of the accident causation model.

4.3.2 Human Errors:

i. The human element is the most flexible, adaptable and valuable part of NESMA AIRLINES system. But it is also the most vulnerable to influence, which can adversely affect its performance.

ii. Errors may occur at the planning stage or during the execution of the plan. **Planning errors** lead to **mistakes**; either the person follows an inappropriate procedure for dealing with a routine problem or builds a plan for an inappropriate course of action to cope with a new situation. Even when the planned action is appropriate, errors may occur in the execution of the plan. The Human Factors literature on such errors in execution generally draws a distinction between slips and lapses. A **slip** is an action which is not carried out as planned and will therefore always be observable. A **lapse** is a failure of memory and may not necessarily be evident to anyone other than the person who experienced the lapse.

It is only when seeing such an error from a complex system viewpoint that we can identify the causes that lead to it and address those causes:



4.3.3 Ergonomics

i. The term "ergonomics" is derived from the Greek words "ergon" (work) and "nomos" (natural law). It is defined as "'the study of the efficiency of persons in their working environment".

ii. It is often used by aircraft manufacturers and designers to refer to the study of human machine design issues (e.g. pilot-cockpit, flight attendant - galley, etc).

4.3.4 The (SHEL) Model:

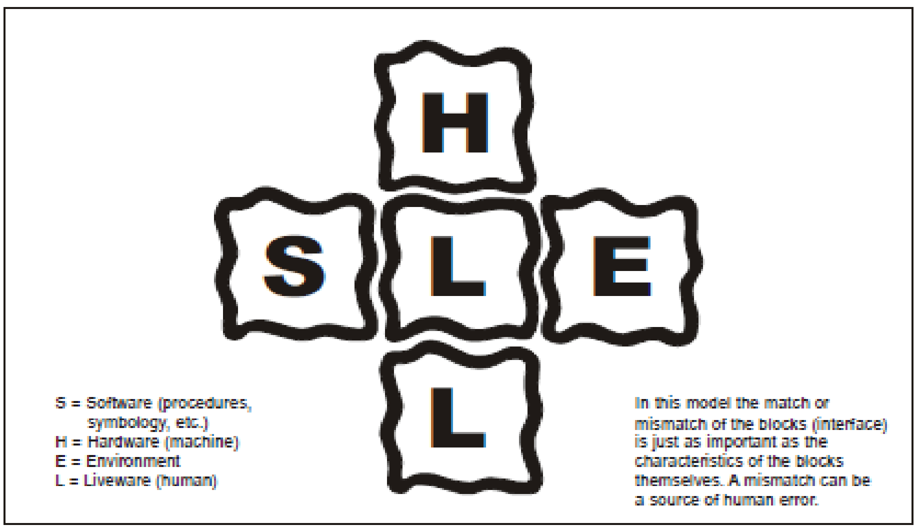
To best illustrate the concept of Human Factors NESMA AIRLINES shall use the (SHEL) model. The name (SHEL) is derived from the initial letters of the models components (Software, Hardware, Environment, and Liveware). The model uses blocks to represent the different components of Human Factors and is then built up one block at *a* time, with a pictorial impression being-given of the need for matching the components. When applied to NESMA AIRLINES, the components (S.H.E.L) will stand for:

S: Software (Procedures, manuals checklists, drills, symbology, etc),

H: Hardware (The Aircraft and its components, e.g. scats, controls, layouts)

E: Environment (the situation in which the L-H-S should function, e.g. weather, working conditions, etc.)

L: Liveware (human element as crew members, ground staff, ATC controller, etc.)



SHEL model

Aircrew work is a continuous interaction between those elements, and as in the SHEL model diagram, matching those elements is as important as the characteristics of blocks themselves. On a daily basis, every staff member has to interact with the other elements to form a single block. As such, any mismatches between the blocks can be a source of human error.

4.3.5 What is (Human Factors)?

- **i.** It studies people working together in concert with machines
- **ii.** It aims at achieving safety and efficiency by optimizing the role of people whose activities relate to complex hazardous systems.
- **iii.** A multidisciplinary field devoted to optimizing human performance and reducing human error,
- **iv.** It incorporates the methods and principles of the behavioural and social sciences, physiology and engineering.

4.3.6 The aim of human factors:

- **i.** By studying the (SHEL) model of Human Factors we notice that the 'Liveware' constitutes a hub and the remaining components must *be* adapted and matched to this central component. In aviation, this is vital, as errors can be deadly,
- **ii.** For that, manufacturers study the Liveware-Hardware interface when designing a new machine and its physical components. Seats are designed to fit the silting characteristics of the human body, controls are designed with proper movement, instruments lay-out and information provided are designed to match the human being characteristics, etc.
- **iii.** The other component which continuously interact with the Liveware is the Software, i.e. all non-physical aspects of the system such as procedures, check-list lay out, manuals, and all what is introduced whether lo regulate the whole or part of the SHEL interaction process or to create defences to cater for deficiencies in that process. Nevertheless, problems in this interface are often more tangible and consequently more difficult to resolve
- **iv.** (e.g. misinterpretation of a procedure, confusion of symbology, etc...)
- **v.** One of (he most difficult interfaces to match in the SIHEL model is the Liveware-Environment part. NESMA AIRLINES system operates within the context of broad social, political, economical and natural constraints that are usually beyond the control of the central Liveware element, but those aspects of the environment will interact in this interface. While *part* of the environment has been adapted to human requirements (pressurisation and air conditioning systems, sound-proofing, etc.) and the human element adapts to natural phenomena (weather avoidance, turbulence, etc,), the incidence of social, political and economical constraints is central on the interface and should be properly considered and addressed by those in management with enough power to alter the outcome and smooth the match.
- **vi.** The Liveware-Liveware interface represents the interaction between the human elements. Adding proficient and effective individuals together to form a group or a set of views does not automatically imply that the group will function in a proficient and effective way unless they can function as a team. For them to successfully do so we need leadership, good communication, crew-co-operation, teamwork and personality interactions. Crew Resource Management (CRM) and Line Oriented Flight Training (LOFT) are designed to accomplish that goal.
- **vii.** When advanced, CRM becomes Corporate or Company Resource Management, since staff-management relationships are within the scope of this interface, as corporate climate and company operating pressures can significantly affect human performance.

viii. In brief. Human Factors in NESMA AIRLINES aim at increasing the awareness of the human element within the context of the system and provide the necessary tools to perfection the match of the SHEL concept. By doing so it aims at improving safety and efficiency.

4.3.7 Safety and Efficiency:

i. Safety and efficiency are so closely interrelated that in many cases their influences overlap and factors affecting one may also affect the other. Human Factors have a direct impact on those two broad areas.

ii. Safety is affected by the Liveware-Hardware interface should a change affect such interface the result might be catastrophic. In a particular aircraft accident, one causal factor cited in the report was that 'variation in panel layout amongst the aircraft in the fleet had adversely affected crew performance"

iii. Safety is also affected by the Liveware-Software interface. Wrong information set in the data-base and unnoticed by the crew or erroneously entered by them can result in a tragedy. In a case where an aircraft crashed into terrain, information transfer and data entry errors were committed by navigation personnel and unchecked by flight Crew were among the causal factors.

iv. The Liveware-Liveware interface also plays a major role in safety; Failure to communicate vital information can result in aircraft and life loss. In one runway collision, misinterpretation of verbal messages and a breakdown in normal communication procedures were considered as causal factors.

v. Finally, safety is affected by the Liveware-Environment interface. Such interface is not only limited to natural, social or economical constraints, it is also affected by the political climate which could lead to a tragedy beyond the control of the Aircrew. An airworthy aircraft which had been maintained in compliance with the regulations, and flown by properly licensed and medically fit crew disintegrated in-flight due to "the detonation of an improvised explosive device located in a baggage container".

vi. Efficiency is also directly influenced by Human Factors and its application. In turn it has a direct bearing on safety.

- For instance, motivation constitutes a major boost for individuals to perform with greater effectiveness, which will contribute to a. safe operation.
- Properly trained and supervised crewmembers working in accordance to SOPs are likely to perform more efficiently and safely.
- Cabin crew understanding of passenger’s behaviour and the emotions they can expect on board is important in establishing a good relationship which will improve the efficiency of service, but will also contribute to efficient and safe handling of emergency situations.
- The proper layout of displays and controls in the cockpit enhances flight efficiency while promoting safety.

4.3.8 Factors Affecting Aircrew Performance:

Although the human element is the most adaptable component of NESMA AIRLINES system that is influenced by many factors which will affect human performance such as fatigue, health and stress. These factors are affected by environmental constraints like temperature, noise, humidity, light, vibration, working hours and load.

i. Fatigue:

- Fatigue may be physiological whenever it reflects inadequate rest, as well as a collection of symptoms associated with disturbed. It may also be psychological as a result of emotional stress, even when adequate physical rest is taken.
- Acute fatigues are induced by long duty periods or an accumulation of particularly demanding tasks performed in a short period of time. Chronic fatigue is the result of cumulative effects of fatigue; over the longer term. Temperature, humidity, noise, workstation design and Hypoxia are all contributing factors to fatigue.

ii. Health:

- Certain pathological conditions (heart attacks, gastrointestinal disorders, etc.) have caused sudden pilot incapacitation and in rare cases have contributed to accidents. But such incapacitation is usually easily detectable by other crewmembers and taken care of by applying the proper procedures.
- The more dangerous type is developed when a reduction in capacity results in a partial or subtle incapacitation. Such incapacitation may go undetected, even by the person affected, and is usually produced by fatigue, stress, the use of some drugs and medicines and certain mild pathological conditions such as hypoglycaemia. As a result of such health conditions, human performance deteriorates in a manner that is difficult to detect and therefore, has a direct impact on flight safely.
- Even though aircrew are subjected lo regular periodical medical examinations to ensure their continuing health, that does not relieve them from the responsibility to take all necessary precautions to maintain their physical fitness. It hardly needs to be mentioned that Illness will have favourable effects on emotions, reduces tension and anxiety and increases resistance to fatigue. Factors known to positively influence fitness are exercise, healthy diet and good sleep/rest management. Tobacco, alcohol, drugs, stress, fatigue and unbalanced diet are all recognised to have damaging effects on health. Finally, it is each individual responsibility to arrive al the workplace "fit to fly[1]'.

iii. Stress:

- Stress can be found in many jobs, and many company's environment is particularly rich in potential stressors. Some of these stresses could be weather phenomena or in-flight emergencies, others like noise, vibration and (G) Forces have been reduced with the advent of the jet age while disturbed circadian rhythms and irregular night flying have increased.
- Stress is also associated with life events which are independent from NESMA AIRLINES system but tightly related to the human element. Such events could be sad ones like a family separation, or happy ones like weddings or childbirth. In all situations, individual responses to stress may differ from a person to another, and any resulting damage should be attributed to the response rather than the stressor itself.
- In an aircrew environment, individuals are encouraged to anticipate, recognize and cope with their own stress and perceive and accommodate stress in others, thus managing stress to a safe end. Failure to do so will only aggravate the stressful situation and might lead lo problems.

4.3.9 Personality vs. Attitude:

i. Personality traits and altitudes influence the way we behave and interact with others. Personality traits are innate or acquired at a very young age. They are deep rooted, stable and resistant to change. They define a person and classify him/her (e.g. ambitious, dominant, aggressive, mean, nice, etc.).

ii. On the contrary, attitudes are learned and enduring tendencies or pre-dispositions to respond in a certain way, the response is the behaviour itself. Attitudes are more susceptible to change through training, awareness or persuasion.

iii. The initial screening and selection process of aircrew aims at detecting undesired personality characteristics in the potential crewmember in order to avoid problems in the future.

iv. Human Factors training aims at modifying attitudes and behaviour patterns through knowledge, persuasion and illustration of examples revealing the impact of attitudes and behaviour on flight safety. That should allow the aircrew to make rapid decisions on what to do when facing certain situations.

4.3.10 Crew resource management (CRM)

i. CRM is a practical application of Human Factors. It aims at teaching crew members how to use their interpersonal and leadership styles in ways that foster crew effectiveness by focusing on the functioning of crew members as a learn, not only as a collection of technically competent individuals, i.e. it aims at making aircrew work in "Synergy" (a combined effect that exceeds the sum of individual effects).

ii. Changes in most airlines community have been drastic throughout this century: the jet age, aeroplane size, sophisticated technology, deregulation, hub and spokes, security threats, industrial strikes and supersonic flights, in every one of those changes some people saw *n* threat, it made them anxious, even angry sometimes.

iii. When first introducing CRM some people might see a threat, since it constitutes a 'change[1]. However, with the majority of accidents having lapses in human performance as a contributing caudal factor, and with nearly two decades of CRM application in the international aviation community revealing a very positive feedback, we see this 'change' as "strength".

iv. CRM can he approached in many different ways, nevertheless there are some essential features that must be addressed: The concept must he understood, certain skills must be taught and inter-active group exercises must be accomplished.

v. To understand the concept one must be aware of certain topics as synergy, the effects of individual behaviour on the team work, the effect of complacency on team efforts, the identification and use of all available resources, the statutory and regulatory position of the pilot-in-command as team leader and commander, the impact of company culture and policies on the individual and the interpersonal relationships and their effect on team work.

vi. Skills to be developed include:

- **Communication skills**

Effective communication is the basis of successful teamwork. Barriers to communication arc explained, such as cultural difference, rank, age, crew position, and wrong altitude. Aircrews are encouraged to overcome such homers through self esteem, participation, polite assertiveness Legitimate avenue of dissent and proper feedback.

- **Situational Awareness**

Total awareness of surrounding environment is emphasized so is the necessity from the crewmember to differentiate between reality and perception of reality, to control distraction, enhance monitoring and cross-checking and to recognize and deal with one's or others incapacitation, especially when subtle.

- **Problem Solving and Decision Making**

That skill aims at developing conflict management within a time constraint. A conflict could be immediate or ongoing; it could require a direct response or certain tact to cope with it. By developing Aircrew judgment within a certain time frame, we develop skills required to bring conflicts to safe ends.

- **Leadership**

In order for a team to function efficiently it requires a leader. Leadership skills derive from authority but depend for their success on the understanding of many components such as managerial and supervisory skills that can be taught and practiced, realizing (he influence of culture on individuals, maintaining an appropriate distance between team members enough lo avoid complacency without creating barriers, care for one's professional skill and credibility, the ability to hold the responsibility of all crew members and the necessity of setting the good example. The improvement of these skills will allow the team to function more efficiently by developing the leadership skills required to achieve a successful and smooth followership in the team.

- **Stress Management**

Commercial pressure, mental and physical fitness to fly, fatigue, social constraints and environmental constraints are all part of our daily life and they all contribute in various degrees to stress. Stress management is about recognising those elements, dealing with one's stress and help others manage their own. It is only by accepting things that are beyond our control, changing things that we can and knowing the difference between both that we can safely and efficiently manage stress.

- **Critique**

Discussion of cases and learning to comment and critique actions are both ways to improve one's knowledge, skills and understanding. Review of actual airlines accidents and incidents to create problem-solving dilemmas that participant Aircrew should act-out and critique through the use of feed-back system will enhance crew member's awareness of their surrounding environment, make them recognize and deal with similar problems and help them solve situations that might occur to them.

Chapter (5)
Safety Implementation Program

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5.2 Cabin Safety Program

5.2.1 General

i. Cabin safety is aimed at minimizing risks to the occupants of the aircraft. By reducing or eliminating hazards with the potential for creating injuries or causing damage, cabin safety focuses on providing a safer environment for the occupants of the aircraft. The range of threats to the aircraft and its occupants include:

- In-flight turbulence;
- Smoke or fire in the cabin;
- Decompression;
- Emergency landings;
- Emergency evacuations; and
- Unruly passengers.

ii. The work environment and working conditions for cabin crew are influenced by a diverse set of human performance issues that may affect how crew respond to threats, errors and other undesirable states cabin. Some of the more common human performance issues affecting the performance of cabin crew are outlined in Appendix 4 to this chapter.

iii. The cabin crews are usually the only company representatives that passengers see while in the aircraft. From the passengers' perspective, the cabin crew are there to provide in-flight service. From the perspective of senior management, the cabin crew may have more to do with creating a favorable corporate image. From a regulatory and operational perspective, cabin crews are on board to manage adverse situations that may develop in the aircraft cabin and to provide direction and assistance to passengers during an emergency.

iv. Following a major aviation accident, investigative attention will likely focus initially on flight operations. As guided by the evidence, the investigation may then expand to include other issues. The triggering event for an accident rarely begins in the passenger compartment. However, improper response by cabin crew to events in the cabin may have more serious consequences. For example:

- Incorrect loading of passengers (e.g. weight and balance considerations);
- Failure to properly secure the cabin and galleys for take-off and landing and in turbulence;
- Delayed reaction to warnings (e.g. of in-flight turbulence);
- Inappropriate response to events in the cabin (e.g. electrical short-circuits, smoke, fumes, or an oven fire); and
- Failure to report significant observations (such as fluid leaks, or wings contaminated by snow or ice) to the flight crew.

v. With much of the cabin crew members' routine activities focused on cabin service, extra effort is required to ensure that cabin service is not provided at the expense of fulfilling their primary responsibilities for passenger safety. It is essential that training and operating procedures for cabin crew address the full range of issues that could have safety consequences.

5.2.2 **Cabin Safety R**equirements

i. Operation of Aircraft specifies requirements with respect to:
- Assignment of emergency duties;
- Role during emergency evacuations;
- Use of emergency equipment;
- Flight- and duty-time limits; and
- Training.

ii. Nesma Airlines is required to establish and maintain an approved training program (including recurrent training) to be completed by all persons before being assigned as cabin crew. This training is aimed at ensuring the competence of cabin crew to perform in emergency situations.

iii. The flight attendant manual provides further guidance for training of cabin crew including:
- Joint training with flight crew in handling of emergencies; and
- Training in assisting flight crew (of two-pilot crews) in the event of flight crew incapacitation.

5.2.3 Managing cabin safety

i. Commitment cabin safety
ii. Positive safety culture
iii. SOPs, checklists and briefings
iv. Hazard and incident reporting
v. Training for cabin safety
vi. Cabin safety standards
vii. Human performance issues affecting cabin safety

5.2.4 **Commitment Cabin S**afety

The provision of cabin service may be viewed as a marketing or customer service function; however, cabin safety is clearly an operational function. Corporate policy should reflect this, and management needs to demonstrate its commitment to cabin safety with more than words. Common indicators of management's commitment to cabin safety include:

i. Allocation of sufficient resources (adequate staffing of cabin crew positions, initial and recurrent training, training facilities, etc.);
ii. clearly defined responsibilities, including the setting, monitoring and enforcing of practical SOPs for safety; and
iii. Fostering of a positive safety culture.

5.2.5 Positive safety culture

Creating a positive safety culture for cabin crew begins with departmental organization. If, as in many airlines, the cabin crew receives their principal direction from marketing rather than from the flight operations department, the focus of cabin crew will probably not be on cabin safety. Other considerations for the promotion of a positive safety culture include:

i. The relationship between flight crew and cabin crew, for example:
- Spirit of cooperation, marked by mutual respect and understanding;
- Effective communications between flight crew and cabin crew[1];

- Regular review of SOPs to ensure compatibility between flight deck and cabin procedures;
- Joint pre-flight briefings for flight crew and cabin crew; and
- Joint debriefings following safety-related occurrences, etc.; and

ii. Cabin crew participation in safety management:

- Involvement of the safety manager in cabin safety issues;
- Avenues for offering cabin safety expertise and advice (safety committee meetings)
- Participation in developing policies, objectives and SOPs affecting cabin safety; and
- Participation in company's incident reporting system, etc.

5.2.6 SOPs, checklists and briefings

i. As in flight deck operations, cabin safety requires strict adherence to well-thought-out and practical SOPs, including the use of checklists and briefings of cabin crew. Procedures include, but are not limited to the following: passenger boarding; seat assignment; stowage of carry-on baggage; emergency exit accessibility and availability; passenger safety briefing; service equipment storage and use; emergency medical equipment storage and use (oxygen, defibrillator, first aid kit, etc.); handling of medical

ii. emergencies; non-medical emergency equipment storage and use (fire extinguishers, protective breathing equipment, etc.); in-flight emergency procedures (smoke, fire, etc.); cabin crew announcements; turbulence procedures (including securing the cabin); handling unruly passengers; emergency evacuations; and routine deplaning.

iii. Procedures for Air Navigation Services – Aircraft Operations include guidance material on SOPs, checklists and crew briefings. The Cabin Safety shall also include guidance for establishing safe procedures for both normal and emergency operations.

5.2.7 Hazard and incident reporting

Cabin crews must be able to report hazards, incidents and safety concerns as they become aware of them without fear of embarrass, incrimination or disciplinary action. Cabin crew, their supervisors and the Q & S director should have no doubts about:

i. The types of hazards that should be reported;
ii. The appropriate reporting mechanism;
iii. Their job security (following the reporting of a safety concern); and
iv. Any safety actions taken to follow up on identified hazards.

5.2.8 Training for cabin safety

i. Cabin crew duties and responsibilities are safety-related, and cabin crew training should clearly reflect this fact. While training can never duplicate all the types of situations that may confront cabin crew, training can instill basic knowledge, skills, attitudes and confidence that will allow cabin crew to handle emergency situations. Cabin crew training should therefore include:

- Initial indoctrination covering basic theory of flight, meteorology, physiology of flight, psychology of passenger behavior, aviation terminology, etc.;
- Hands-on training (if practicable using cabin simulators for fire, smoke and evacuation drills);

- In-flight supervision (on-job-training);
- Annual recurrent training and re-qualification;
- Knowledge and skills in CRM, including coordinating activities with the flight crew;
- joint training exercises with flight crew to practice drills and procedures used in flight and in emergency evacuations; and
- Indoctrination in function and use of selected aspects of the company's SMM (such as hazard and incident reporting); etc.

ii. In an emergency, the expertise of the cabin crew will be required with little or no warning. Thus, effective safety training for cabin crew requires practice to maintain the sharpness necessary in emergency.

iii. The Training Manual - Cabin Attendants' Safety Training, should addresses safety training for cabin crew.

5.2.9 Cabin safety standards

i. Safety inspections, safety surveys and safety audits are tools that can be used to ensure that requisite cabin safety standards are being maintained. NESMA AIRLINES's cabin safety standards may be confirmed through an ongoing program of:

- Aircraft inspections (e.g. emergency exits, emergency equipment, and galleys);
- Pre-flight (ramp) inspections;
- In-flight cabin inspections (e.g. passenger briefings and demonstrations, crew briefings and use of checklists, crew communications, discipline, and situational awareness);
- Training inspections (e.g. facilities, quality of instruction, and records); and
- Base inspections (e.g. crew scheduling, dispatch, safety incident reporting and response), etc.

ii. A company's internal safety audit program should include the cabin crew department. The audit process should include a review of all cabin operations, as well as an audit of cabin safety procedures, training, the cabin crew's operating manual, etc.

5.2.10 Human performance issues affecting cabin safety

The work environment and working conditions for cabin crew are influenced by a diverse set of Human Factors. Some of the more common factors to consider in developing a cabin safety program include:

i. Crew Resource Management (CRM). With ever-larger cabin crews, the cabin crew must work together as a team. CRM training for cabin crew could include:

- Communications and interpersonal skills. Hesitancy to communicate important data to other team members could jeopardize a flight. Polite assertiveness is required for effective teamwork;
- Situational awareness. Maintaining an accurate perception of evolving events requires questioning, cross-checking, refinement and updating of perception;
- Problem solving, decision-making skills and judgment may be critical in the event of an in-flight emergency or in a situation requiring emergency evacuation or ditching Leadership/followership skills. While in charge, cabin crew require well-developed leadership skills, but individual cabin crew members must respect command authority during an emergency.

ii. Fatigue, jet lag and other disturbances to normal sleep patterns are a part of the job. Yet, fatigue can seriously compromise the response of cabin crew in an emergency. Maximum alertness is required during the approach and landing phase, often at the end of a long duty period.

iii. Personality factors. Cabin crew requires skill in handling diverse personality types. In addition, cultural diversity can influence outcomes in an emergency, not only among the passengers, but also in culturally mixed crews.

iv. Workload and stress. The pace of cabin duties varies widely, especially during long-haul operations. Learning to cope with the stress of intense workloads and boredom are fundamental to maintaining situational awareness and the mental acuity required in an emergency.

v. Competence. A function of experience and currency is vital to maximizing effectiveness. Multiple-type currencies resulting in transferring from one aircraft type to another may compromise effective emergency response due to difficult and possibly inappropriate habit transfer.

vi. Equipment design. During safety audits, attention should be paid to equipment design factors that may compromise safe performance of duties by cabin crew (strength requirements, reach, user-friendliness, etc.).

5.3 Aircraft Maintenance Safety Program

5.3.1 General

i. Until recently, less attention had been paid to systematically reducing risks arising from aircraft maintenance activities than from flight operations. Yet, maintenance and inspection errors are cited as a factor in a number of accidents and serious incidents worldwide each year.

ii. The safety of flight is dependent on the airworthiness of the aircraft. Safety management in the areas of maintenance, inspection, repair and overhaul are therefore vital to flight safety. Maintenance organizations need to follow the same disciplined approach to safety management as is required for flight operations. Adhering to such a discipline in maintenance can be difficult. Maintenance activities may be conducted by the airline itself, or they may be contracted out to approved maintenance organizations, and as a result, these activities may take place well away from the airline's home base.

iii. Conditions for maintenance-related failures may be set in place long before an eventual failure. For example, an undetected fatigue crack may take years to progress to the point of failure. Unlike flight crews who have near real-time feedback on their errors, maintenance personnel usually receive little feedback on their work until a failure occurs. During this time lag, maintenance workers may continue to create the same latent unsafe conditions. As a consequence, the maintenance world incorporates a combination of safety defenses, including multiple redundancies of aircraft systems, to strengthen the system. These defenses also include such things as certification of maintenance organizations, licensing of AMEs, airworthiness directives, detailed SOPs, job cards, inspection of work, and sign-offs and records of work completed.

iv. Risk potential may be created by the conditions under which maintenance is often conducted, including such variables as organizational issues, work site conditions and human performance issues pertinent to aircraft maintenance. Some of the broader issues in maintenance potentially affecting safety are outlined in Appendix 1 to this chapter.

v. The term "safety" in an aircraft maintenance context is often considered to have two connotations. One is an emphasis on industrial safety and hygiene for the protection of AMEs, facilities and equipment. The second is the process for ensuring that AMEs provide airworthy aircraft for flight operations. Although the two may be inextricably linked, this chapter concentrates on the latter, with little reference to Occupational Safety and Health (OSH) issues.

5.3.2 Managing safety in maintenance

Given the nature of the maintenance function, the working environment for AMEs, and the many Human Factors issues which may compromise their expected performance, a systematic approach to safety is called for, i.e. a safety management system (SMS) that recognizes organizational interdependencies and interactions, with the need to integrate safety efforts across the entire operation. Successful SMS is built upon the following three cornerstones.

i. Corporate approach to safety;
ii. Effective tools for programme delivery; and
iii. Formal system for safety oversight and programme evaluation.

5.3.3 Corporate approach to maintenance safety

i. The corporate approach to safety sets the tone for how the organization develops its safety philosophy and its safety culture. In deciding on the approach the organization wishes to take towards safety management, the following factors may be relevant:

- Size of the maintenance organization (large operators tend to require more structure);
- Nature of the operations(e.g. around-the-clock, international or scheduled operations versus domestic or unscheduled operations);
- Organizational status (e.g. department of an airline versus an independent enterprise);
- Maturity of the organization and its workforce (e.g. corporate stability and experience);
- Labor-management relationships (e.g. recent history and complexity); f) current corporate culture (versus desired safety culture); and
- Scope of maintenance work (e.g. line servicing versus heavy overhaul of aircraft or major systems).

ii. **Organizing for safety**

- NESMA AIRLINES organizational structures reflect direct and informal reporting lines between operations, safety and maintenance. Such communication channels depend on the trust and respect established in the day-to-day working relationships of those involved.
- For an aircraft operator, the safety manager (SM) must have clearly defined responsibilities and reporting lines with respect to safety management in maintenance. The maintenance organization may require a technical specialist to work with the SM. As a minimum, the SM will require specialist advice from the maintenance department.
- The company's safety committee should include representation from the maintenance department. In large operators, a dedicated sub-committee for maintenance safety issues may be warranted.

iii. **Documentation and records management**

Maintenance departments depend heavily on systems for systematically acquiring, storing and retrieving the voluminous information required for safety management. Some examples follow:

- Technical libraries must be kept current (for such things as engineering orders, type certifications, airworthiness directives and service bulletins).
- Maintenance defects and work completed must be recorded in detail.
- Performance and system monitoring data must be retained for trend analysis.
- Corporate safety policies, objectives and goals must be formally documented and distributed.

- Records must be kept on personnel training, qualification and currency, etc.
- Information on component history, life, etc. must be kept.
- Much of this information could be computerized. Therefore, the success of an SMS in a maintenance organization will largely depend on the quality and timeliness of its document and records management systems.

iv. Resource allocations

The best SMS on paper will be useless without adequate resources. To protect against losses due to an accident, expenditures will be required. For example, resources need to be allocated for:

- Personnel with expertise to design and implement the maintenance safety system;
- Training in safety management for all staff; and
- Information management systems to store safety data, and expertise to analyze the data.

v. Safety culture

A poor safety culture in a maintenance organization can lead to unsafe work practices not being corrected - possibly creating latent unsafe conditions that may not cause a problem for years. Management's success in fostering a positive safety culture in the maintenance department will derive in large measure from how the foregoing issues are addressed and from how the SMS is implemented.

5.3.4 Principal tools for safety management in maintenance

Effective operation of an SMS for maintenance builds upon risk-based decision-making, a concept that has long been integral to maintenance practices. For example, maintenance cycles are built upon probabilities that systems and components would not fail for the period of the cycle. Components are often replaced because they are "time expired", even though they may remain functionally serviceable. Based on knowledge and experience, risks of unexpected failure are reduced to acceptable levels.

Some of the principal tools for operating an SMS for the maintenance function include:

i. Clearly defined and enforced SOPs;
ii. Risk-based resource allocations;
iii. Hazard and incident reporting systems;
iv. Flight data analysis programmes;
v. Trend monitoring and safety analyses (including cost-benefit analyses);
vi. Competent investigation of maintenance-related occurrences;
vii. Training in safety management; and
viii. Communication and feedback systems (including information exchange and safety promotion).

5.3.5 Safety audit and programme evaluation

i. As with any "system", feedback is required to ensure that the individual elements of the maintenance SMS are functioning as intended. Continuing high standards of safety in a maintenance organization imply regular monitoring and surveillance of all maintenance activities. This is especially so at the interfaces between workers (such as between maintenance personnel and flight crews, between personnel of different trades, or between staff on changing work shifts) to avoid problems "falling through the cracks". (Ref, to chapter: 3.3 for the conduct of regular safety audits).

ii. Change is inevitable in the aviation industry, and the maintenance area is no exception. The Director of Maintenance may require that a safety assessment be carried out in respect of any significant changes in the maintenance organization. Circumstances that might warrant a safety assessment include a corporate merger, and introduction of a new fleet, equipment, systems or facilities. Consequently, the need for any adjustments can be identified and corrected.

iii. The maintenance SMS should be regularly evaluated to ensure that expected results are being achieved. Programme evaluation should provide satisfactory responses to such questions as:

- To what extent has management succeeded in establishing a positive safety culture?
- What are the trends in hazard and incident reporting (by technical trade, by aircraft fleet, etc.)?
- Are hazards being identified and resolved?
- Have adequate resources been provided for the maintenance SMS?

5.3.6 Managing procedural deviations in maintenance

i. The maintenance system includes not only the Aircraft Maintenance Engineers AMEs on the shop floor but also all the other technicians, planners, managers, stores keepers and other persons that contribute to the maintenance process. In such a broad system, procedural deviations and errors in maintenance are inevitable and pervasive.

ii. Accidents and incidents attributable to maintenance are more likely to be caused by the actions of humans than by mechanical failure. Often, they involve a deviation from established procedures and practices. Even mechanical failures may reflect errors in observing (or reporting) minor defects before they progress to the point of failure.

iii. Maintenance errors are often facilitated by factors beyond the control of the AME, for example:

- Information required to do the job;
- Equipment and tools required;
- Aircraft design limitations;
- Job or task requirements;
- Technical knowledge or skill requirements;
- Factors affecting individual performance (i.e. SHEL factors)

- Environmental or workplace factors;
- Organizational factors such as corporate climate; and
- Leadership and supervision.

i. Safe maintenance organizations foster the conscientious reporting of maintenance errors, especially those that jeopardize airworthiness, so that effective action can be taken. This requires a culture in which staff feel comfortable reporting errors to their supervisor once the errors are recognized.

ii. New systems are being developed for managing procedural deviations (and errors) in aircraft maintenance. Typically, these systems are a subset of an overall maintenance SMS and exhibit the following characteristics:

- They encourage uninhibited reporting of occurrences that would not otherwise be required to be reported.
- They provide training for staff on the purpose and procedures for using the maintenance SMS, including clear definition of departmental disciplinary policies (e.g. disciplinary action should only be necessary for instances of recklessness or willful disregard of promulgated instruction on procedures).
- They conduct competent safety investigations of reported errors.
- They seek appropriate safety action in follow-ups to identified safety deficiencies.
- They provide feedback to the workforce.
- They provide data suitable for trend analysis.

5.3.7 Maintenance errors management

Managing maintenance errors shall provide both the Maintenance manager and Q & S director with a structured method for analyzing and tracking the factors leading to maintenance errors and for recommending error prevention strategies per the following five basic steps, namely:

i. **Event**. Following an event, it is the responsibility of the Q & S director to select the error-caused aspects that will be investigated.

ii. **Decision**. After fixing the problem and returning the aircraft to service, the Q & S director decides if the event was maintenance-related. If yes, the Q & S director performs a maintenance error investigation.

iii. **Investigation**. The Q & S director carries out an investigation and records general information with respect to the aeroplane, when the maintenance and the event occurred, the event that precipitated the investigation, the error that caused the event, the factors that contributed to the error and possible prevention strategies.

iv. **Prevention Strategies**. Management reviews, prioritizes, implements and then tracks prevention strategies (process improvements) in order to avoid or reduce the likelihood of similar errors occurring in the future.

i. **Feedback** is provided to the maintenance workforce in order for AMEs to know that changes have been made to the maintenance system as a result of the process. Management is responsible for affirming the effectiveness of employees' participation and validating their contribution to the process by sharing investigation results with them.

5.3.8 Safety maintenance challenges

i. A company Q & S director will often face challenges in providing sound advice to senior management on the maintenance portion of the SMS - especially if the SM's background is not in aircraft maintenance. Some challenges include:

- Understanding safety management in the context in which maintenance work is carried out;
- Developing personal credibility, especially in acquiring sufficient knowledge of accepted safe industry work practices and maintaining currency with respect to industry developments in aircraft maintenance.
- Developing and maintaining effective working relationships with:
  - Managers accountable for aircraft maintenance and for integrating maintenance safety into the overall corporate SMS; and
  - Potential technical advisers;
- Developing synergy among maintenance personnel and other participants in SMS;
- Developing a spirit of cooperation and routine coordination of activities between flight operations and maintenance, particularly on such matters as adequacy of discrepancy reporting, or operating an FDA system;
- Providing timely and credible analysis of safety data gathered through the various tools used for hazard identification; and
- Obtaining the participation and commitment of the maintenance department on company safety committees.

ii. In reviewing the effectiveness of safety management in maintenance, the Q & S director should pay particular attention to such issues as:

- Adequacy of maintenance documentation;
- Quality of communications up and down, as well as laterally within the maintenance organization;
- Environmental factors affecting human performance;
- Quality of training, both for job-related knowledge and technical skills;
- Error reporting and trend analysis systems aimed at the identification of systemic hazards;
- The means for effecting any necessary changes to reduce or eliminate identified safety deficiencies; and
- The existence of an error-tolerant and non-punitive safety culture.

5.3.9 Maintenance working conditions

Listed below are some of the typical issues impacting on the working conditions under which aircraft maintenance is carried out:

i. Organizational issues:

- Time pressures to sustain on-time departures and around-the-clock operations;
- Ageing aircraft requiring intensive inspections for fatigue, corrosion, condition,
- New technologies requiring new tools, new work procedures, costly retraining, etc.;
- "fix-it" focus to stay on schedule (e.g. replacing broken parts without determination as to why they failed - perhaps due to poor design or incorrect assembly);
- Airline expansions and mergers (e.g. combining maintenance departments with different work practices and safety cultures);
- Outsourcing of services to subcontractors (e.g. for heavy maintenance and overhaul);
- Unwitting introduction of (lower cost, substandard) bogus parts, etc.; and
- Licensing of AMEs for different aircraft, aircraft generations, types and manufacturers;

ii. Work site conditions:

- Aircraft designs that are not user-friendly from a maintenance perspective (for example, ramped access to components and inappropriate height off the ground);
- Control of aircraft configurations (which are continually subject to modifications) versus standardization of maintenance tasks and procedures;
- Availability (and accessibility) of spares, tools, documentation, etc.;
- Requirements for having ready access to voluminous technical information, and the need for maintaining detailed work records;
- Variable environmental factors (for example, conditions on the ramp versus in the technical workshop versus on the hangar floor);
- Unique operating conditions created by concurrent activities and inclement weather on the ramp; and
- Shortcomings in the provision of timely, accurate, understandable discrepancy reports by flight crews, etc.; and

iii. Human Factors in maintenance:

- Organizational and working conditions (as described above);
- Environmental factors (e.g. temperature, lighting and noise);
- Individual factors (e.g. workload, physical demands and maintenance);
- Scheduling (e.g. shift work, night work and overtime) versus adequacy of rest periods;
- Appropriateness of SOPs (e.g. correctness, understandability and usability);
- Quality of supervision;
- Proper use of job cards, etc. (i.e. do actual floor practices comply with SOPs?);
- Adequacy of formal training, on-the-job training (OJT), recurrent training and Human Factors training;
- Adequacy of handovers at shift changes and record keeping;
- Cultural factors (e.g. AME’s professionalism and openness to report errors and hazards)

5.4 Aerodrome Safety Operation

5.4.1 General

i. Safety, regularity and efficiency of aircraft operations at aerodromes are of paramount importance. Although the potential for a catastrophic accident during aircraft operations on the ground exists, the likelihood of a minor accident while the aircraft is on the ground, particularly during a turnaround, is high. Aircraft operators incur significant financial losses associated with accidents during ground operations.

ii. Accidents and incidents occurring in flight are generally well reported and investigated. However, ground accidents - do not always - receive the same level of attention. Minor accidents and incidents may be a breeding ground for more serious accidents (Ref. to: Chapter 2.4 for (1:600 Rule)).

iii. Understanding the conditions that create hazards to safety at aerodromes is vital to effective safety management.

iv. Safety at aerodromes requires much the same approach to safety management as that required for safe flight operations. The concentration of many different activities at aerodromes creates unique circumstances with significant accident potential.

v. Ground occurrences must be seen within the overall context of aerodrome operations. Aerodromes bring together a volatile mixture of activities with high-risk potential. Some of the factors contributing to this risk potential include:

- Traffic volume and mixture (including domestic and international, scheduled and non-scheduled, charter and specialty operations, commercial and recreational aviation, fixed and rotary wing, etc.);
- Vulnerability of aircraft on the ground (awkward, fragile, etc.);
- abundance of high-energy sources (including jet blast, propellers, fuels)
- extremes of weather (temperatures, winds, precipitation and poor visibility);
- wildlife (birds and animals) hazards;
- aerodrome layout (especially taxiway routings, congested apron areas, and building and structure design limiting line of sight, possibly leading to a runway incursion);
- inadequacy of visual aids (e.g. signs, markings and lighting);
- non-adherence to established procedures (especially at uncontrolled aerodromes);
- vehicles on the apron;
- problems in information transfer (communications) with those operating on the airside;
- runway usage (including simultaneous multiple runway usage, intersection departures and preferential runways);
- Ground and apron control (sometimes compromised by frequency congestion, use of non-standard phraseology, language difficulties, mistaken call signs, etc.);
- Inadequacy and unreliability of visual and non-visual aids for landing;
- Airspace limitations (topographie, obstructions, noise abattement requirements);
- Security issues;
- Construction activities at an operational aerodrome; and
- Capacity enhancement procedures and use of existing facilities not designed for newer generation aircraft.

vi. Within its operating context, an aerodrome provides a diverse set of services to support flight operations. Some of these include:

- Flight planning, including weather services;
- Navigation, approach and landing aids;
- Communication services;
- Air traffic, ground and apron control;
- Runway and apron maintenance (including snow and ice removal, bird and wildlife control, FOD removal, etc.);
- Aircraft servicing of all types;
- Aerodrome security;
- Aerodrome emergency services (i.e. rescue and firefighting services);
- Management of tenants (aviation operators, service contractors, etc.); and
- Customer management (passengers, freight shippers, etc.).

vii. Given the complexity of the aerodrome environment, a systematic approach to safety is required in order to coordinate the various activities for the safe delivery of services. An SMS provides such a coherent approach. In so doing, the safety philosophy and the supporting policies are developed, operating procedures are coordinated and implemented, and day-to-day operational practices are systematically monitored.

viii. In short, an SMS helps create an aerodrome safety culture conducive to safe operations.

5.4.2 Aerodrome safety management

i. NESMA AIRLINES SMS should include the safety policy, structure of the organization and individual and group responsibilities for safety issues, setting of safety performance targets and internal safety audit and review systems, with a view to ensuring that operations are carried out in a demonstrably controlled way.

ii. Traditionally, aerodromes were owned and operated by the State. Increasingly, this is changing as aerodromes are corporatized (or privatized) and the management is turned over from government officials to aerodrome authorities or private entities. Regardless of whether the aerodrome is managed by the State or a private entity, safety remains a primary concern. A robust SMS can facilitate safe aircraft operations at an aerodrome. However, the adoption of an SMS does not obviate the need to comply with the applicable national regulations. Within the framework of an aerodrome SMS, the aerodrome management must oversee the activities of all the service providers, tenants, contractors and others to ensure the safest and most efficient performance of the aerodrome.

5.4.3 Scope for Aerodrome Safety Management

i. An aerodrome SMS can only provide a means of controlling those hazards which originate within the aerodrome system, or in which some element of the aerodrome system could be a contributory factor.

ii. As an example of the latter, the aerodrome safety system cannot directly address the causes of an emergency landing due to an aircraft system malfunction; it can only address the consequences of an emergency landing at that aerodrome. However, it is important that the aerodrome procedures for handling an emergency do not increase the severity of the emergency.

iii. Within this manual, the term aerodrome system includes all of the people, technology and procedures required for the operation of an aerodrome, and the interfaces between them.

iv. Given the diverse activities of many different agencies, the maintenance of high safety standards at aerodromes implies a regular programme of monitoring and surveillance. At the interfaces between stakeholders (for example, aerodrome employees versus the employees of airlines, or contracted service providers), there may be a tendency to shift responsibilities, stating that "it is not my problem". For this reason, it is essential that roles and responsibilities are clearly defined.

v. Change is everywhere as aerodromes expand to meet increasing demand. New runways and taxiways, terminal buildings, shops and warehouses, etc., have the potential to introduce new safety hazards. The Quality & Safety director may require that a safety assessment be carried out in respect of any proposals for significant changes in the level of facilities, services and operation of the aerodrome.

5.4.4 NESMA AIRLINES Aerodrome SMS Implementation

i. While it is the responsibility of the State CAA to promulgate appropriate legislative and regulatory provisions concerning aerodromes, NESMA AIRLINES is responsible for it's day-to-day operation management at the aerodrome.

ii. Given the complexity of the factors creating risk potential at aerodromes, the aerodrome management must coordinate the activities of the diverse stakeholders at an aerodrome often with conflicting expectations and priorities. The sharing of a common focus among the stakeholders, most of whom are employees of agencies other than the aerodrome authority, needs to be fostered. In addition, resource commitments from the airlines and other service providers must be obtained.

iii. The NESMA AIRLINES aerodrome SMS begins with development of appropriate safety policy and operating procedures. Which are more likely to be implemented if stakeholders participate in their development and if they are included in appropriate contractual documents, such as leases and operating authorities.
A high degree of cooperation by all stakeholders will also be necessary to achieve the desired level of standardization and interoperability required for safe ground operations.

5.4.5 Safety occurrence reporting

i. Hazards can only be controlled if their existence is known. One powerful tool for proactively identifying safety hazards is through safety occurrence reporting. Through a non-punitive, occurrence reporting system, the Quality & Safety director can tap the diversity of views available at an aerodrome in identifying underlying situations or conditions with the potential for endangering the safety of aircraft operations (Ref. to chapter: 2.1, for hazard identification and reporting process) as follows:

- Mandatory reporting of accidents and incidents required by State regulations;
- Voluntary reporting of safety occurrences which may not be reported under the mandatory reporting provisions.

ii. In implementing an occurrence reporting system, aerodrome employees, contractors and tenants should all be clear on:

- The types of hazards that should be reported;
- The reporting mechanisms;
- Their job security; and
- Actions taken in following up on identified hazards.

5.4.6 Safety audits

i. An effective SMS for an aerodrome should also incorporate a safety audit programme which covers all the activities conducted at the aerodrome. Such safety reviews would also cover the apron activities of service providers. A good understanding of Human Factors issues involving groups of employees, such as maintenance personnel, baggage handlers and vehicle operators, will provide insights into safety hazards. Cooperative arrangements with the management of a like-sized aerodrome may provide the opportunity to gain additional expertise and experience for effective safety reviews and audits.

ii. Safety auditing is a core safety management activity, providing a means of identifying potential problems before they have an impact on safety (Ref. to Chapter: 3.3 for the principles and practices for establishing a safety audit programme).

iii. NESMA AIRLINES should arrange for an audit of the aerodrome SMS, including an inspection of the aerodrome facilities and equipment. The aerodrome operator should also arrange an external audit for the evaluation of aerodrome users, including aircraft operators, ground handling agencies and other organizations working at the aerodrome. Such external audits should be conducted by suitably qualified safety experts.

5.4.7 Aerodrome emergency planning

i. Many accidents occur on or in the vicinity of aerodromes, creating a strain on the resources of aerodromes. Responding appropriately and in a timely fashion to an aircraft emergency is one of the most critical challenges facing aerodrome management. To ensure an appropriate response at such times of high stress,

ii. The emergency response plan (ERP) should include detailed requirements regarding the necessary coordination with other agencies involved, and reflects a collaborative effort between aerodrome management, the resident stakeholders and those who will have to execute the plan (Ref. to chapter: 2.3, for emergency response plan ERP).

iii. The objective of aerodrome emergency planning is to minimize the effects of an emergency, particularly with regard to saving lives and maintaining aircraft operations and outlines the procedures for coordinating the response of different aerodrome agencies (or services) and those agencies in the surrounding community that could be of assistance in responding to the emergency.

5.4.8 Aerodrome emergency exercises

i. The aerodrome ERP provides the theoretical framework for a coordinated response to emergencies occurring on or in the vicinity of aerodromes. However periodic testing of the ERP is crucial for determining where gaps may exist in the plan, for example, resolving misunderstandings among participants about the workability of the procedures in place, and unrealistic estimates of requirements (time, resources, etc.). Testing the plan also allows participants to get to know each other, familiarize themselves with the airport facilities, etc. and to learn how other services operate. It also confirms the vital communication links.

ii. Some of the more important considerations in preparing an exercise plan for the ERP are listed below:

- Aerodrome emergency service personnel are regularly tested on:
  - Emergency response procedures, first aid, etc.;
  - Firefighting; and

- Emergency evacuations, including knowledge of relevant aircraft systems and evacuation routes; etc.;
- Communication and call-out procedures are tested and kept up to date;
- Crash and fire routes are well understood, kept clear and inspected regularly;
- Command post is designated, equipped and tested;
- Temporary morgue facilities are available;
- Procedures are in place (and regularly tested) for:
  - Crowd control;
  - Media access; and
  - Receiving families and next of kin of accident victims;
- Clearing of aircraft wreckage, or recovery of aircraft; and
- Provision for restoration of service or continued operation of the aerodrome, etc.

5.4.9 Aerodrome apron safety

i. Apron accidents often involve relatively minor damage, although at times they may lead to more serious damage. Aircraft skin and ground-servicing equipment may be damaged and/or employees may be injured. Sometimes, contact between a catering truck or ground-servicing vehicle and an aircraft may cause minor damage that may go unnoticed or unreported, but may contribute to a subsequent in-flight emergency.

ii. Aircraft are easy to damage and expensive to repair. Even minor ground handling accidents are expensive as they incur such indirect costs as schedule disruptions and passenger accommodations. Yet, because such occurrences may not fall within the definition of an aviation accident, aviation organizations frequently view them from the perspective of occupational health and safety or environmental safety as opposed to a critical aspect of maintaining safe and efficient flight operations.

iii. The apron work environment is often less than ideal for safe operations from a human performance perspective. Difficulties can arise from the variety of activities, congestion in a restricted environment, tight time pressures, and often-poor weather or lighting conditions. Apron operations present scenarios with often-conflicting goals that require rapid risk management decisions. Balancing the requirement for safety against operating pressures to provide a quick turnaround of the aircraft to avoid delays and disruptions calls for trade-offs. Shortcuts in following SOPs may be taken to facilitate on-time departures, usually without adverse consequences. Workers may be chastised (perhaps even penalized) for failure to keep things moving. Yet, they may be "punished" if the practices they followed contributed to an accident. How can this vicious cycle be broken?

iv. An effective SMS and corresponding activities are applied to prevent apron accidents. Some factors warranting special consideration include:

- Structured training geared to staff capabilities, including:
  - Orientation for safety;
  - Safe operation of ground support equipment;
  - Need for compliance with SOPs; and
  - Skills training such as marshalling signals, and seasonal skills such as de-icing;
  - Clear practical SOPs which are understood, practiced and enforced;

- Hazard and incident reporting system which encourages input from ground servicing personnel;
- Competent investigation of apron mishaps, with particular emphasis on the human Performance aspects;
- Effective collection and analysis of relevant ground safety data;
- Fostering of a positive safety culture for all Nesma Airlines apron workers, whereby they take “ownership” for their safety record;
- Representation of ground handlers and servicing personnel on a separate sub - safety committee for ground safety;
- Feedback to workers regarding identified hazards and actions taken to reduce or eliminate them;
- Ongoing programme of safety awareness; and
- Monitoring of ground system safety (through regular assessments and audits).

5.4.10 Causes of apron accidents

Many ground occurrences are not reported. Nevertheless, based on industry experience, the following general statements can be made about the causes of apron accidents:

i. Regulations or Standard Operating Procedures (SOPs) are inadequate or not followed.
ii. Poor discipline and inadequate supervision set up many accidents (particularly that involving excessive vehicle speed).
iii. Equipment incorrect use or abuse of the ground handling equipment may lead to apron accidents.
iv. Dynamic environment with constant motion (and commotion) makes maintenance of situational awareness difficult even for experienced personnel.
v. Weather limits human performance.
vi. Training versus exposure to risk. Generally, skilled employees are adequately trained. However, a high proportion of relatively unskilled workers on the apron, who are exposed to significant risk daily, usually receive little safety training and supervision.
vii. Human performance. Apron accidents often involve Human Factors arising from such things as misjudgment, obscured vision, stress, distraction, time (or peer) pressures, complacency, ignorance, fatigue, and insufficient supervision.

5.4.11 NESMA AIRLINES Safety policy for an aerodrome

i. The NESMA AIRLINES aerodrome principal safety objective is to minimize, as much as is reasonably practicable, the risk of an aircraft accident at or in the vicinity of the aerodrome. Thus, safety shall be afforded the highest priority throughout the activities and take priority over commercial, environmental and social considerations.

ii. To achieve its principal safety objective, the NESMA AIRLINES shall apply a formalized and proactive approach to systematic safety management within the aerodrome operation. A safety management system shall be implemented in respect of all activities and supporting services which are under the managerial control of NESMA AIRLINES.

iii. Everyone involved in the operation aspects of the aerodrome operation has an individual safety responsibility for his/her own actions. As safety is an integral function of management, all line managers are accountable for the safety performance of their areas of responsibility, and for ensuring that safety, requirements are complied with.

iv. The NESMA AIRLINES aerodrome operations shall comply with all statutory obligations and with the safety management requirements of the state regulatory CAA.

4.5.12 Factors contributing to hazards in the apron work environment

The following points illustrate some of the factors which contribute to a hazardous work environment on an aerodrome apron.

i. Aircraft ground handling comprises the activities required to turn an aircraft around, including:

- Marshalling and chocking arriving aircraft;
- Refueling;
- Correcting maintenance defects and performing routine aircraft maintenance;
- De-icing and anti-icing of aircraft;
- Aircraft catering, cleaning cabins and servicing water and toilets;
- Passenger embarkation/disembarkation;
- Loading and unloading of baggage and freight; and
- Aircraft towing and pushback.

ii. In addition to the complexity of apron operations, the nature of ground handling poses significant potential for safety hazards due in part to:

- Aircraft size and shape versus vehicle driver's susceptibility to misperceptions and misjudgments of distance and location;
- The aircraft's fragile skin and appendages, e.g. aerials and probes which are easily damaged;
- Need to preserve the aerodynamic and structural integrity of the aircraft;
- Constraints of space and time; and
- Number of unskilled, low-paid and poorly motivated workers.
- Several Human Factors exacerbate the accident potential of the foregoing. The following factors typically characterize the workplace and content of ground handling duties.
- Hostile work environment (noise, jet-blast, diverse weather and difficult light conditions);
- Working in limited (often height-restricted) space in the midst of congestion of other servicing vehicles, personnel and adjoining aircraft movements;
- Time pressures for on-time departures (or to make up for late running);
- Cyclical workload with peak demands followed by lulls between transiting aircraft;
- Frequent shift work;
- Requirement to operate a variety of expensive, specialized servicing equipment;
- Workforce (especially for loaders) often comprises casual unskilled labor;
- Apron workers are often employed by organizations other than the aerodrome authority (e.g. airlines, service providers and catering companies); and
- Organizational factors deriving from management's failure to provide a similar level of attention to ground safety as it does to flight safety.

5.5 Alcohol Misuse Prevention and Drug Testing Programs (Refer to ECAR 121 App. I & J)

5.5.1 General

The purpose of this Chapter is to establish programs designed to help prevent accidents and injuries resulting from the misuse of alcohol by employees who perform safety-sensitive functions in aviation.

i. Accident

Means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and the time all such persons have disembarked, and in which any person suffers death or serious injury or in which the aircraft receives substantial damage;

ii. Alcohol

Means the intoxicating agent in beverage alcohol, ethyl alcohol, or other low molecular weight alcohols, including methyl or isopropyl alcohol;

iii. Alcohol Concentration (or content)

Means the alcohol in a volume of breath expressed in terms of grams of alcohol per 210 liters of breath as indicated by an evidential breath test under this Chapter;

iv. Alcohol Use

Means the consumption of any beverage, mixture, or preparation, including any medication, containing alcohol;

v. Confirmation Test

Means a second test, following a screening test with a result 0.02 or greater, that provides quantitative data of alcohol concentration;

vi. Consortium

Means an entity, including a group or association of employers or contractors, that provides alcohol testing as required by this appendix and that acts on behalf of such employers or contractors, provided that it has submitted an alcohol misuse prevention program certification statement to the ECAA in accordance with this Chapter;

i. Contractor Company

Means a company that has employees who perform safety-sensitive functions by contract for an NESAMA AIRLINES;

ii. Covered Employee

Means a person who performs, either directly or by contract, a safety-sensitive function for an NESMA AIRLINES (as defined below). For purposes of pre-employment testing only, the term "covered employee" includes a person applying to perform a safety-sensitive function;

iii. NESMA AIRLINES

Means a Part 121 certificate holder; a Part 145 certificate holder; an air traffic control facility and any training agency;

iv. Performing (a safety-sensitive function)

An employee is considered to be performing a safety-sensitive function during any period in which he or she is actually performing, ready to perform, or immediately available to perform such functions;

v. Refuse to submit (to an alcohol test)

Means that a covered employee fails to provide adequate breath for testing without a valid medical explanation after he or she has received notice of the requirement to be tested in accordance with this chapter, or engages in conduct that clearly obstructs the testing process;

vi. Screening Test

Means an analytical procedure to determine whether a covered employee may have a prohibited concentration of alcohol in his or her system; and

vii. Violation Rate

Means the number of covered employees found during random tests given under this Chapter to have an alcohol concentration of 0.04 or greater plus the number of employees who refused a random test required by this appendix, divided by the total reported number of employees in the industry given random alcohol tests under this appendix plus the total reported number of employees in the industry who refuse a random test required by this Chapter;

5.5.2 Requirement for notice

a. Before performing an alcohol test under this chapter, NESMA AIRLINES shall notify a covered employee that the alcohol test is required by this chapter;
b. Each employee who performs a function listed in this section directly or by contract for NESMA AIRLINES as defined in this chapter must be subject to alcohol testing under an ECAA-approved alcohol misuse prevention program implemented in accordance with this chapter. The covered safety-sensitive functions are :

1) Cockpit crewmember duties;
2) Cabin crew duties;
3) Flight instruction duties;
4) Aircraft dispatcher duties;
5) Aircraft maintenance or preventive maintenance duties;
6) Ground security coordinator duties;
7) Aviation screening duties; and
8) Air traffic control duties.
9) Ground Handling duties.

5.5.3 Tests required

i. Pre-employment:

- Prior to the first time a covered employee performs safety-sensitive functions for NESMA AIRLINES, the employee shall undergo testing for alcohol. NESMA AIRLINES shall not allow a covered employee to perform safety-sensitive functions unless the employee has been administered an alcohol test with a result indicating an alcohol concentration less than 0.04. If a pre-employment test, result under this paragraph indicates an alcohol concentration of 0.02 or greater but less than 0.04, the provisions of paragraph (f) of section V of this chapter apply;
- NESMA AIRLINES is not required to administer an alcohol test as required if:
  - The employee has undergone an alcohol test required by this appendix within the previous 6 months, with a result indicating an alcohol concentration less than 0.04; and
  - NESMA AIRLINES ensures that no prior employer of the covered employee of whom the employer has knowledge has records of a violation of this appendix within the previous 6 month.

ii. Post-accident:

- As soon as practicable following an accident, NESMA AIRLINES shall test each surviving covered employee for alcohol if that employee's performance of a safety-sensitive function either contributed to the accident or cannot be completely discounted as a contributing factor to the accident. The decision not to administer a test under this chapter shall be based on the NESMA AIRLINES determination, using the best available information at the time of the determination, that the covered employee's performance could not have contributed to the accident;
- If a test required by this section is not administered within 2 hours following the accident, NESMA AIRLINES shall prepare and maintain on file a record stating the reasons the test was not promptly administered. If a test required by this section is not administered within 8 hours following the accident, the employer shall cease attempts to administer an alcohol test and shall prepare and maintain the same record. Records shall be submitted to the ECAA upon request of the ECAA or his or her designee;
- NESMA AIRLINES shall submit to the ECAA each record of a test required by this section that is not completed within 8 hours. The employer's records of tests that are not completed within 8 hours shall be submitted to the ECAA by March 15 for the preceding year (from January till December). Each record shall include the following information:
  - i. Type of test (reasonable suspicion/post-accident);
  - ii. Triggering event (including date, time, and location);
  - iii. Employee category (do not include employee name or other identifying information);
  - iv. Reason(s) test could not be completed within 8 hours; and
  - v. If blood alcohol testing could have been completed within eight hours, the name, address, and telephone number of the testing site where blood testing could have occurred.
- A covered employee who is subject to post-accident testing shall remain readily available for such testing or may be deemed by NESMA AIRLINES to have refused to submit to testing. Nothing in this chapter shall be construed to require the delay of necessary medical attention for injured people following an accident or to prohibit a covered employee from leaving the scene of an accident for the period necessary to obtain assistance in responding to the accident or to obtain necessary emergency medical care.

iii. Random testing:

Except as provided in paragraphs 2-4 of this section, the minimum annual percentage rate for random alcohol testing will be 25 percent of the covered employees;

- The ECAA's decision to increase or decrease the minimum annual percentage rate for random alcohol testing is based on the violation rate for the entire industry. In order to ensure reliability of the data, the ECAA considers the quality and completeness of the reported data, may obtain additional information or reports from employers, and may make appropriate modifications in calculating the industry violation rate;
- When the minimum annual percentage rate for random alcohol testing is 25 percent or more, the ECAA may lower this rate to 10 percent of all covered employees if the ECAA determines that the data received under the reporting requirements of this appendix for two consecutive calendar years indicate that the violation rate is less than 0.5 percent;
- When the minimum annual percentage rate for random alcohol testing is 50 percent, the ECAA may lower this rate to 25 percent of all covered employees if the ECAA determines that the data received

under the reporting requirements of this appendix for two consecutive calendar years indicate that the violation rate is less than 1.0 percent but equal to or greater than 0.5 percent;

- When the minimum annual percentage rate for random alcohol testing is 10 percent, and the data received under the reporting requirements of this appendix for that calendar year indicate that the violation rate is equal to or greater than 0.5 percent but less than 1.0 percent, the ECAA will increase the minimum annual percentage rate for random alcohol testing to 25 percent of all covered employees;
- When the minimum annual percentage rate for random alcohol testing is 25 percent or less, and the data received under the reporting requirements of this appendix for that calendar year indicate that the violation rate is equal to or greater than 1.0 percent, the ECAA will increase the minimum annual percentage rate for random alcohol testing to 50 percent of all covered employees;
- The selection of employees for random alcohol testing shall be made by a scientifically valid method, such as a random-number table or a computer-based random number generator that is matched with employees' I.D. number, payroll identification numbers, or other comparable identifying numbers. Under the selection process used, each covered employee shall have an equal chance of being tested each time selections are made;
- The employer shall randomly select a sufficient number of covered employees for testing during each calendar year to equal an annual rate not less than the minimum annual percentage rate for random alcohol testing determined by the ECAA. If the employer conducts random testing through a consortium, the number of employees to be tested may be calculated for each individual employer or may be based on the total number of covered employees who are subject to random alcohol testing at the same minimum annual percentage rate under this appendix;
- Each employer shall ensure that random alcohol tests conducted under this appendix are unannounced and that the dates for administering random tests are spread reasonably throughout the calendar year;
- Each employer shall require that each covered employee who is notified of selection for random testing proceeds to the testing site immediately; provided, however, that if the employee is performing a safety-sensitive function at the time of the notification, the employer shall instead ensure that the employee ceases to perform the safety- sensitive function and proceeds to the testing site as soon as possible;
- A covered employee shall only be randomly tested while the employee is performing safety-sensitive functions; just before the employee is to perform safety-sensitive functions; or just after the employee has ceased performing such functions;
- If a given covered employee is subject to random alcohol testing under the alcohol testing rules of more than one agency, the employee shall be subject to random alcohol testing at the percentage rate established for the calendar year by the agency regulating more than 50 percent of the employee's functions; and
- If an employer is required to conduct random alcohol testing under the alcohol testing rules of more than one agency, the employer may
  - Establish separate pools for random selection, with each pool containing the covered employees who are subject to testing at the same required rate; or
  - Randomly select such employees for testing at the highest percentage rate established for the calendar year by any agency to which NESMA AIRLINES is subject.

iv. Reasonable suspicion testing:

- NESMA AIRLINES shall require a covered employee to submit to an alcohol test when NESMA AIRLINES has reasonable suspicion to believe that the employee has violated the alcohol misuse prohibitions in the ECARs;
- The NESMA AIRLINES determination that reasonable suspicion exists to require the covered employee to undergo an alcohol test shall be based on specific, contemporaneous, articulable observations concerning the appearance, behavior, speech or body odors of the employee. The required observations shall be made by a supervisor who is trained in detecting the symptoms of alcohol misuse. The supervisor who makes the determination that reasonable suspicion exists shall not conduct the breath alcohol test on that employee;
- Alcohol testing is authorized just preceding, or just after the period of the work day that the covered employee is required to be in compliance with this rule. An employee may be directed by NESMA AIRLINES to undergo reasonable suspicion testing for alcohol only while the employee is performing safety-sensitive functions; just before the employee is to perform safety-sensitive functions; or just after the employee has ceased performing such functions;
- If a test required by this chapter is not administered within 2 hours following the determination made under this chapter, NESMA AIRLINES shall prepare and maintain on file a record stating the reasons the test was not promptly administered. If a test required by this chapter is not administered within 8 hours following the determination made under this chapter, NESMA AIRLINES shall cease attempts to administer an alcohol test and shall state in the record the reasons for not administering the test;
- NESMA AIRLINES shall submit to the ECAA each record of a test required by this chapter that is not completed within 8 hours. The NESMA AIRLINES records of tests that are not completed within 8 hours shall be submitted to the ECAA by March for the preceding calendar year. Each record shall include the following information:
    - Type of test (reasonable suspicion/post-accident);
    - Triggering event (including date, time, and location);
    - Employee category (do not include employee name or other identifying information);
    - Reason(s) test could not be completed within 8 hours; and
    - If blood alcohol testing could have been completed within eight hours, the name, address, and telephone number of the testing site where blood testing could have occurred.
- Notwithstanding the absence of a reasonable suspicion alcohol test under this chapter, no covered employee shall report for duty or remain on duty requiring the performance of safety-sensitive functions while the employee is under the influence of or impaired by alcohol, as shown by the behavioral, speech, or performance indicators of alcohol misuse, nor shall NESMA AIRLINES permit the covered employee to perform or continue to perform safety-sensitive functions until:
    - An alcohol test is administered and the employee's alcohol concentration measures less than 0.02; or
    - The start of the employee's next regularly scheduled duty period, but not less than 8 hours following the determination made under paragraph 2 of this chapter that there is reasonable suspicion that the employee has violated the alcohol misuse provisions in the ECARs.

v. Return to duty testing

- NESMA AIRLINES shall ensure that before a covered employee returns to duty requiring the performance of a safety-sensitive function after engaging in conduct prohibited in the ECARs, the employee shall undergo a return to duty alcohol test with a result indicating an alcohol concentration of less than 0.02.

vi. Follow-up testing

Following a determination under this chapter that a covered employee is in need of assistance in resolving problems associated with alcohol misuse, NESMA AIRLINES shall ensure that the employee is subject to unannounced follow-up alcohol testing as directed by a substance abuse professional in accordance with the provisions of this chapter. A covered employee shall be tested under this paragraph only while the employee is performing safety-sensitive functions; just before the employee is to perform safety-sensitive functions; or just after the employee has ceased performing such functions.

vii. Re-testing of covered employees

with an alcohol concentration of 0.02 or greater but less than 0.04 NESMA AIRLINES shall retest a covered employee to ensure compliance with the provisions of this chapter, if NESMA AIRLINES chooses to permit the employee to perform a safety-sensitive function within 8 hours following the administration of an alcohol test indicating an alcohol concentration of 0.02 or greater but less than 0.04.

5.5.3 Handling of test results, record retention, and confidentiality

i. Retention of records:

- General Requirement. NESMA AIRLINES shall maintain records of its alcohol misuse prevention program as provided in this chapter. The records shall be maintained in a secure location with controlled access;
- Period of Retention. NESMA AIRLINES shall maintain the records in accordance with the following schedule:
  - Five years: Records of employee alcohol test results with results indicating an alcohol concentration of 0.02 or greater, documentation of refusals to take required alcohol tests, calibration documentation, employee evaluations and referrals, and copies of any annual reports submitted to the ECAA under this chapter shall be maintained for a minimum of 5 years;
  - Two years: Records related to the collection process (except calibration of evidential breath testing devices) and training shall be maintained for a minimum of 2 years; and
  - One year: Records of all test results below 0.02 shall be maintained for a minimum of 1 year.

ii. Types of records:

The following specific records shall be maintained:

- Records related to the collection process:
  - Collection logbooks, if used;
  - Documents relating to the random selection process;
  - Calibration documentation for evidential breath testing devices;
  - Documentation of breath alcohol technician training;
  - Documents generated in connection with decisions to administer reasonable suspicion alcohol tests;
  - Documents generated in connection with decisions on post-accident tests; and

  - Documents verifying existence of a medical explanation of the inability of a covered employee to provide adequate breath for testing.
- Records related to test results:
  - The NESMA AIRLINES copy of the alcohol test form, including the results of the test;
  - Documents related to the refusal of any covered employee to submit to an alcohol test required by this chapter; and
  - Documents presented by a covered employee to dispute the result of an alcohol test administered under this chapter.
- Records related to other violations of ECARs;
- Records related to evaluations;
  - Records pertaining to a determination by a substance abuse professional concerning a covered employee's need for assistance;
  - Records concerning a covered employee's compliance with the recommendations of the substance abuse professional; and
  - Records of notifications to the approved medical examiner of violations of the alcohol misuse prohibitions.

iii. Records related to education and training:

  - Materials on alcohol misuse awareness, including a copy of the NESMA AIRLINES policy on alcohol misuse;
  - Documentation of compliance with the requirements of this chapter;
  - Documentation of training provided to supervisors for the purpose of qualifying the supervisors to make a determination concerning the need for alcohol testing based on reasonable suspicion; and
  - Certification that any training conducted under this chapter complies with the requirements for such training.

iv. Reporting of results in a management information system:

- Annual reports summarizing the results of alcohol misuse prevention programs shall be submitted to the ECAA in the form and manner prescribed by the ECAA by March of each year covering the previous calendar year (January 1 through December 31) in accordance with the provisions below:
  - Each certificate holder shall submit an annual report each year;
  - Each entity conducting an alcohol misuse prevention program under the provisions of this chapter, that has 50 or more covered employees on January 1 of any calendar year shall submit an annual report to the ECAA for that calendar year; and
  - The ECAA reserves the right to require NESMA AIRLINESs not otherwise required to submit annual reports to prepare and submit such reports to the ECAA. NESMA AIRLINES that will be required to submit annual reports under this provision will be notified in writing by the ECAA.
- Each report shall be submitted in the form and manner prescribed by the ECAA;
- Each report shall be signed by the NESMA AIRLINES alcohol misuse prevention program manager or other designated representative;

- Each report that contains information on an alcohol screening test result of 0.02 or greater or a violation of the alcohol misuse provisions of the ECARs shall include the following informational elements:
  - Number of covered employees by employee category;
  - Number of covered employees in each category subject to alcohol testing under the alcohol misuse rule;
  - Number of screening tests by type of test and employee category;
  - Number of confirmation tests, by type of test and employee category;
  - Number of confirmation alcohol tests indicating an alcohol concentration of 0.02 or greater but less than 0.04 by type of test and employee category;
  - Number of confirmation alcohol tests indicating an alcohol concentration of 0.04 or greater, by type of test and employee category;
  - Number of persons denied a position as a covered employee following a pre-employment alcohol test indicating an alcohol concentration of 0.04 or greater;
  - Number of covered employees with a confirmation alcohol test indicating an alcohol concentration of 0.04 or greater who were returned to duty in covered positions (having complied with the recommendations of a substance abuse professional as described in this chapter);
  - Number of covered employees who were administered alcohol and drug tests at the same time, with both a positive drug test result and an alcohol test result indicating an alcohol concentration of 0.04 or greater;
  - Number of covered employees who were found to have violated other alcohol misuse provisions of the ECARs, and the action taken in response to the violation;
  - Number of covered employees who refused to submit to an alcohol test required under this chapter, the number of such refusals that were for random tests, and the action taken in response to each refusal; and
  - Number of supervisors who have received required training during the reporting period in determining the existence of reasonable suspicion of alcohol misuse.
- Each report with no screening test results of 0.02 or greater or violations of the alcohol misuse provisions of the ECARs shall include the following informational elements. (This report may only be submitted if the program results meet these criteria):
  - Number of covered employees by employee category;
  - Number of covered employees in each category subject to alcohol testing under the alcohol misuse rule;
  - Number of screening tests by type of test and employee category;
  - Number of covered employees who engaged in alcohol misuse who were returned to duty in covered positions (having complied with the recommendations of a substance abuse professional as described this chapter);
  - Number of covered employees who refused to submit to an alcohol test required under this chapter, and the action taken in response to each refusal; and
  - Number of supervisors who have received required training during the reporting period in determining the existence of reasonable suspicion of alcohol misuse.

i. An ECAA-approved consortium may prepare reports on behalf of individual aviation NESMA AIRLINES for purposes of compliance with this reporting requirement. However, the aviation NESMA AIRLINES shall sign and submit such a report and shall remain responsible for ensuring the accuracy and timeliness of each report prepared on its behalf by a consortium. **Access to records and facilities:**

- Except as required by law or expressly authorized or required in this chapter, NESMA AIRLINES shall not release covered employee information that is contained in records required to be maintained under this chapter;
- A covered employee is entitled, upon written request, to obtain copies of any records pertaining to the employee's use of alcohol, including any records pertaining to his or heralcohol tests. NESMA AIRLINES shall promptly provide the records requested by the employee. Access to an employee's records shall not be contingent upon payment for records other than those specifically requested;
- NESMA AIRLINES shall make available copies of all results of alcohol testing conducted under this chapter and any other information pertaining to the NESMA AIRLINES alcohol misuse prevention program, when requested by the ECAA;
- When requested by the ECAA as part of an accident investigation, NESMA AIRLINES shall disclose information related to the NESMA AIRLINES administration of a post-accident alcohol test administered following the accident under investigation;
- Records shall be made available to a subsequent NESMA AIRLINES upon receipt of written request from the covered employee. Disclosure by the subsequent NESMA AIRLINES is permitted only as expressly authorized by the terms of the employee's request;
- NESMA AIRLINES may disclose information required to be maintained under this chapter pertaining to a covered employee to the employee or to the decision maker in a lawsuit, grievance, or other proceeding initiated by or on behalf of the individual and arising from the results of an alcohol test administered under this chapter or from the NESMA AIRLINES determination that the employee engaged in conduct prohibited under the ECARs (including, but not limited to, a worker's compensation, unemployment compensation, or other proceeding relating to a benefit sought by the employee);
- NESMA AIRLINES shall release information regarding a covered employee's records as directed by the specific, written consent of the employee authorizing release of the information to an identified person. Release of such information by the person receiving the information is permitted only in accordance with the terms of the employee's consent; and
- NESMA AIRLINES shall permit access to all facilities utilized in complying with the requirements of this chapter to the ECAA.

5.5.4 Consequences for employees engaging in alcohol-related conduct

i. Removal from safety-sensitive function:

- Except as provided in this chapter, no covered employee shall perform safety-sensitive functions if the employee has engaged in conduct prohibited by the ECARs or an alcohol misuse rule; and
- NESMA AIRLINES shall not permit any covered employee to perform safety-sensitive functions if NESMA AIRLINES has determined that the employee has violated this paragraph.
- Permanent disqualification from service an employee who violates the ECARs' alcohol misuse requirements, or who engages in alcohol use that violates another alcohol misuse provisions and had previously engaged in alcohol use that violated the provisions of the ECARs after becoming subject to such prohibitions is permanently precluded from performing for NESMA AIRLINES the safety-sensitive duties the employee performed before such violation.

ii. Notice to the approved medical examiner:

- If NESMA AIRLINES determines that a covered employee who holds an airman medical certificate has engaged in alcohol use that violated the alcohol misuse provisions of the ECARs shall notify the approved medical examiner within 2 working days;
- Each such NESMA AIRLINES shall forward to the approved medical examiner a copy of the report of any evaluation performed under the provisions of this chapter within 2 working days of the NESMA AIRLINES receipt of the report;
- All documents shall be sent to the approved medical examiner; and
- No covered employee who holds an airman medical certificate shall perform safety-sensitive duties for NESMA AIRLINES following a violation until and unless the approved medical examiner has recommended that the employee be permitted to perform such duties.

iv. Notice of refusals:

- Except as provided in this paragraph, NESMA AIRLINES shall notify the ECAA within 5 working days of any covered employee who holds a license and/or certificate that has refused to submit to an alcohol test required under this chapter. Notifications should be sent to: approved medical board or approved medical examiner; and
- NESMA AIRLINES is not required to notify the above office of refusals to submit to pre-employment alcohol tests or refusals to submit to return to duty tests.

v. Required evaluation and testing: No covered employee who has engaged in conduct prohibited by the ECARs shall perform safety-sensitive functions unless the employee has met the requirements of this chapter. NESMA AIRLINES shall not permit a covered employee who has engaged in such conduct to perform safety-sensitive functions unless the employee has met the requirements of this chapter.

vi. Other alcohol-related conduct:

- No covered employee tested under the provisions of this chapter who is found to have an alcohol concentration of 0.02 or greater but less than 0.04 shall perform or continue to perform safety-sensitive functions for an NESMA AIRLINES, nor shall NESMA

AIRLINES permit the employee to perform or continue to perform safety-sensitive functions, until

- The employee's alcohol concentration measures less than 0.02; or
- The start of the employee is next regularly scheduled duty period, but not less than 8 hours following administration of the test.

- Except as provided in this paragraph, NESMA AIRLINES shall not take any action under this rule against an employee based solely on test results showing an alcohol concentration less than 0.04. This does not prohibit NESMA AIRLINES with authority independent of this rule from taking any action otherwise consistent with law.

5.5.6 Alcohol misuse information, training, and referral

i. General requirements:

NESMA AIRLINES shall provide educational materials that explain these alcohol misuse requirements and the NESMA AIRLINES policies and procedures with respect to meeting those requirements:

- NESMA AIRLINES shall ensure that a copy of these materials is distributed to each covered employee prior to the start of alcohol testing under the NESMA AIRLINES ECAA-mandated alcohol misuse prevention program and to each person subsequently hired for or transferred to a covered position; and
- (ii) NESMA AIRLINES shall provide written notice to representatives of employee organizations of the availability of this information.

ii. Required content:

The materials to be made available to employees shall include detailed discussion of at least the following:

- The identity of the person designated by NESMA AIRLINES to answer employee questions about the materials;
- The categories of employees who are subject to the provisions of these alcohol misuse requirements;
- Sufficient information about the safety-sensitive functions performed by those employees to make clear what period of the work day the covered employee is required to be in compliance with these alcohol misuse requirements;
- Specific information concerning employee conduct that is prohibited by this chapter;
- The circumstances under which a covered employee will be tested for alcohol under this chapter;
- The procedures that will be used to test for the presence of alcohol, protect the employee and the integrity of the breath testing process, safeguard the validity of the test results, and ensure that those results are attributed to the correct employee;
- The requirement that a covered employee submit to alcohol tests administered in accordance with this chapter;
- An explanation of what constitutes a refusal to submit to an alcohol test and the attendant consequences.

- The consequences for covered employees found to have violated the prohibitions in this chapter, including the requirement that the employee be removed immediately from performing safety-sensitive functions, and the procedures under this chapter;
- The consequences for covered employees found to have an alcohol concentration of 0.02 or greater but less than 0.04; and
- Information concerning the effects of alcohol misuse on an individual's health, work, and personal life; signs and symptoms of an alcohol problem; and available methods of evaluating and resolving problems associated with the misuse of alcohol; and intervening when an alcohol problem is suspected, including confrontation, referral to any available employee assistance program, and/or referral to management.

iii. Optional provisions:

The materials supplied to covered employees may also include information on additional NESMA AIRLINES policies with respect to the use or possession of alcohol, including any consequences for an employee found to have a specified alcohol level, that are based on the NESMA AIRLINES authority independent of this chapter. Any such additional policies or consequences must be clearly and obviously described as being based on independent authority:

- Training for supervisors NESMA AIRLINES shall ensure that persons designated to determine whether reasonable suspicion exists to require a covered employee to undergo alcohol testing under section II of this chapter receive at least 60 minutes of training on the physical, behavioral, speech, and performance indicators of probable alcohol misuse;
- Referral, evaluation, and treatment: Each covered employee who has engaged in conduct prohibited by the ECARs shall be advised by NESMA AIRLINES of the resources available to the employee in evaluating and resolving problems associated with the misuse of alcohol, including the names, addresses, and telephone numbers of substance abuse professionals and counseling and treatment programs; and
- Each covered employee who engages in conduct prohibited by the ECARs shall be evaluated by a substance abuse professional who must determine what assistance, if any, the employee needs in resolving problems associated with alcohol misuse.

iv. Before a covered employee returns to duty requiring the performance of a safety-sensitive function after engaging in conduct prohibited by the ECARs, the employee shall undergo a return-to-duty alcohol test with a result indicating an alcohol concentration of less than 0.02.

v. In addition, each covered employee identified as needing assistance in resolving problems associated with alcohol misuse:

- Shall be evaluated by a substance abuse professional to determine whether the employee has properly followed any rehabilitation program prescribed under subparagraph 2 of this paragraph; and
- Shall be subject to unannounced follow-up alcohol tests administered by NESMA AIRLINES following the employee's return to duty. The number and frequency of such follow-up testing shall be determined by a substance abuse professional, but shall consist of at least six tests in the first 12 months following the employee's return to duty. NESMA AIRLINES may direct the employee to undergo testing for drugs (both return to duty and follow-up), in addition to alcohol testing, if the substance abuse professional determines that drug testing is necessary

for the particular employee. Any such drug testing shall be conducted in accordance with the requirements of the ECARs. Follow-up testing shall not exceed 60 months from the date of the employee's return to duty. The substance abuse professional may terminate the requirement for follow-up testing at any time after the first six tests have been administered, if the substance abuse professional determines that such testing is no longer necessary.

- Evaluation and rehabilitation may be provided by the NESMA AIRLINES, by a substance abuse professional under contract with the NESMA AIRLINES, or by a substance abuse professional not affiliated with the NESMA AIRLINES. The choice of substance abuses professional and assignment of costs shall be made in accordance with NESMA AIRLINES /employee agreements and NESMA AIRLINES policies.
- NESMA AIRLINES shall ensure that a substance abuse professional who determines that a covered employee requires assistance in resolving problems with alcohol misuse does not refer the employee to the substance abuse professional's private practice or to a person or organization from which the substance abuse professional receives remuneration or in which the substance abuse professional has a financial interest. This paragraph does not prohibit a substance abuse professional from referring an employee for assistance provided through:
  - A public agency;
  - NESMA AIRLINES or a person under contract to provide treatment for alcohol problems on behalf of the NESMA AIRLINES;
  - The sole source of therapeutically appropriate treatment under the employee's health insurance program; or
  - The sole source of therapeutically appropriate treatment reasonably accessible to the employee.

- The requirements of this paragraph with respect to referral, evaluation, and rehabilitation do not apply to applicants who refuse to submit to pre-employment testing or have a pre-employment test with a result indicating an alcohol concentration of 0.04 or greater.

5.5.7 NESMA AIRLINES alcohol misuse prevention program

i. NESMA AIRLINES shall submit an alcohol misuse prevention program (AMPP) as prescribed in this chapter, in duplicate, to the ECAA
   - The ECAA may revoke its authorization in the case of any contractor company that fails to properly implement its AMPP; and
   - NESMA AIRLINES shall not use a contractor company's employee who is not subject to the NESMA AIRLINES AMPP unless NESMA AIRLINES has first determined that the employee is subject to the contractor company's ECAA-mandated AMPP.
   - A consortium may be authorized to establish a consortium AMPP under the auspices of this chapter by submitting a certification statement meeting the requirements of this chapter directly to the ECAA. Each consortium that so certifies shall implement the AMPP on behalf of the consortium members in accordance with the provisions of this chapter:
   - The ECAA may revoke its authorization in the case of any consortium that fails to properly implement the AMPP;

- NESMA AIRLINES – if participates in ECAA approved consortium - remains individually responsible for ensuring compliance with the provisions of these alcohol misuse requirements and must maintain all records required under this chapter; and
- Each consortium shall notify the ECAA of any membership termination within 10 days of such termination.
- Any person who applies for a certificate after the effective date of the final rule shall submit an alcohol misuse prevention program (AMPP) certification statement to the ECAA prior to beginning operations pursuant to the certificate. The AMPP shall be implemented concurrently with beginning such operations or on the date specified in this chapter, whichever is later. Contractor employees to a new certificate holder must be subject to an ECAA-mandated AMPP within 180 days of the implementation of the NESMA AIRLINES AMPP; and
- NESMA AIRLINES, and each contractor company that submits a certification statement directly to the ECAA, shall notify the ECAA of any proposed change in status. NESMA AIRLINES or Contractor Company must ensure that it is continuously covered by an ECAA-mandated alcohol misuse prevention program.

ii. Required content of AMPP certification statements:

Each AMPP certification statement submitted by NESMA AIRLINES or a contractor company shall provide the following information:

- The name, address, and telephone number of NESMA AIRLINES/ contractor company and for the NESMA AIRLINES /contractor company AMPP manager;
- ECAA operating certificate number (if applicable);
- The date on which NESMA AIRLINES or contractor company will implement its AMPP;
- If the submitter is a consortium member, the identity of the consortium; and
- A statement signed by an authorized representative of NESMA AIRLINES or contractor company certifying an understanding of an agreement to comply with the provisions of the ECAA's alcohol misuse prevention regulations.

- Each consortium certification statement shall provide the following information:
  - The name, address, and telephone number of the consortium's AMPP manager;
  - A list of the specific services the consortium will be providing in implementation of ECAA mandated AMPPs; and
  - A statement signed by an authorized representative of the consortium certifying an understanding of an agreement to comply with the provisions of the ECAA's alcohol misuse prevention regulations.

5.5.8 Employees located outside the Arab Republic of Egypt

i. No covered employee shall be tested for alcohol misuse while located outside the territory of the Arab Republic of Egypt:
   - Each covered employee who is assigned to perform safety-sensitive functions solely outside the territory of the Arab Republic of Egypt shall be removed from the random testing pool upon the inception of such assignment; and
   - Each covered employee who is removed from the random testing pool under this paragraph shall be returned to the random testing pool when the employee resumes the performance of safety-sensitive functions wholly or partially within the territory of the Arab Republic of Egypt.

ii. The provisions of this chapter shall not apply to any person who performs a safety-sensitive function by contract for NESMA AIRLINES outside the territory of the Arab Republic of Egypt.

Drug Testing Program

5.5.9 General

i. NESMA AIRLINES shall ensure that drug-testing programs conducted pursuant to and comply with the requirements of ECARs.

ii. **Accident** means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage;

iii. **Annualized rate** for the purposes of unannounced testing of employees based on random selection means the percentage of specimen collection and testing of employees performing a safety-sensitive function during a calendar year. NESMA AIRLINES shall determine the annualized rate by referring to the total number of employees performing a safety-sensitive function for NESMA AIRLINES at the beginning of the calendar year;

iv. **Contractor company** means a company that has employees who perform safety-sensitive functions by contract for Nesma Airlines;

v. **Employee** is a person who performs, either directly or by contract, a safety-sensitive function for Nesma Airlines, as defined below;

vi. **NESMA AIRLINES** is a certificate holder, an air traffic control facility, an approved maintenance organization or any approved aviation training center;

vii. **Performing (a safety-sensitive function)** an employee is considered to be performing a safety-sensitive function during any period in which he or she is actually performing, ready to perform such function;

viii. **Positive rate** means the number of positive results for random drug tests conducted plus the number of refusals to take random tests required by this:

ix. chapter, divided by the total number of random drug tests conducted plus the number of refusals to take random tests required by this chapter;

x. **Prohibited drug** means marijuana, cocaine, opiates, phencyclidine (PCP), amphetamines, or any substance specified in the Egyptian laws, unless the drug is being used as authorized by a legal prescription;

xi. **Refusal to submit** means that an individual failed to provide a urine sample, without a genuine inability to provide a specimen (as determined by a medical evaluation), after he or she has received notice of the requirement to be tested in accordance with this chapter, or engaged in conduct that clearly obstructed the testing process;

xii. **Verified negative drug test result** means that the test result of a urine sample collected and tested has been verified by an approved medical examiner as negative; and

xiii. **Verified positive drug test result** means that the test result of a urine sample collected and tested has been verified by an approved medical examiner as positive.

5.5.10 Employees who must be tested

Each person who performs a safety-sensitive function directly or by contract for NESMA AIRLINES must be tested pursuant to an ECAA approved anti-drug program as follows:

i. Cockpit crewmember duties;
ii. Cabin crew duties;
iii. Flight instruction duties;
iv. Aircraft dispatcher duties;
v. Aircraft maintenance or preventive maintenance duties;
vi. Ground security coordinator duties;
vii. Aviation screening duties; and
viii. Air traffic control duties.
ix. Ground Handling duties.

5.5.11 Substances for which testing must be conducted

NESMA AIRLINES hall test each employee who performs a safety-sensitive function for evidence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines during each test required. As part of a reasonable cause drug testing program established, NESMA AIRLINES may test for additional drugs only with approval granted by the ECAA.

5.5.12 Types of drug testing required

NESMA AIRLINES shall conduct the following types of testing:

i. Pre-employment testing:

Prior to the first time an individual performs a safety-sensitive function for Nesma Airlines, NESMA AIRLINES shall require the individual to undergo testing for prohibited drug use.

- NESMA AIRLINES is permitted to require pre-employment testing of an individual if the following criteria are met:
- – The individual previously performed a covered function for Nesma Airlines;
- – NESMA AIRLINES removed the individual from NESMA AIRLINES random testing program conducted for reasons other than a verified positive test result on an ECAA mandated drug test or a refusal to submit to such testing;
- – The individual will be returning to the performance of a safety-sensitive function.
- NESMA AIRLINES shall not allow an individual, required to undergo pre-employment testing, to perform a safety-sensitive function unless NESMA AIRLINES has received a verified negative drug test result for the individual; and

ii. NESMA AIRLINES shall advise each individual applying to perform a safety-sensitive function at the time of application that the individual will be required to undergo pre-employment testing to determine the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs in the individual's system.

iii. Periodic testing:

Each employee who performs a safety-sensitive function for NESMA AIRLINES and who is required to undergo a medical assessment that is required by ECAR shall submit to a periodic drug test. The employee shall be tested for the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs during the first calendar year of implementation of NESMA AIRLINES anti-drug program. The tests shall be conducted in conjunction with the first medical evaluation of the employee or in accordance with an alternative method for collecting periodic test specimens detailed in NESMA AIRLINES approved anti-drug program. NESMA AIRLINES may discontinue periodic testing of its employees after the first calendar year of implementation of NESMA AIRLINES anti-drug program when NESMA AIRLINES has implemented an unannounced testing program based on random selection of employees;

iv. Random testing:

- Except as provided in this chapter, the minimum annual percentage rate for random drug testing shall be 50 percent of covered employees;
- When the minimum annual percentage rate for random drug testing is 50 percent, the ECAA may lower this rate to 25 percent of all covered employees if the ECAA determines that the data received under the reporting requirements for two consecutive calendar years indicate that the reported positive rate is less than 1.0 percent;
- When the minimum annual percentage rate for random drug testing is 25 percent, and the data received under the reporting requirements for any calendar year indicate that the reported positive rate is equal to or greater than 1.0 percent, the ECAA will increase the minimum annual percentage rate for random drug testing to 50 percent of all covered employees;
- The selection of employees for random drug testing shall be made by a scientifically valid method, such as a random-number table or a computer-based random number generator that is matched with employees' payroll identification numbers, or other comparable identifying numbers. Under the selection process used, each covered employee shall have an equal chance of being tested each time selections are made;

- NESMA AIRLINES shall randomly select a sufficient number of covered employees for testing during each calendar year to equal an annual rate not less than the minimum annual percentage rate for random drug testing determined by the ECAA.
- NESMA AIRLINES shall ensure that random drug tests conducted are unannounced and that the dates for administering random tests are spread reasonably throughout the calendar year. Moreover NESMA AIRLINES shall provide access to NESMA AIRLINES records of random drug testing, as determined to be necessary by the approved medical examiner to ensure NESMA AIRLINES compliance with the rule.

v. Post-accident testing:

NESMA AIRLINES shall test each employee who performs a safety-sensitive function for the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs in the employee's system if that employee's performance either contributed to an accident or can not be completely discounted as a contributing factor to the accident. The employee shall be tested as soon as possible but not later than 32 hours after the accident. The decision not to administer a test must be based on a determination, using the best information available at the time of the determination, that the employee's performance could not have contributed to the accident.

vi. Testing based on reasonable cause:

Reasonably suspected of using a prohibited drug. NESMA AIRLINES shall test an employee's specimen for the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs. NESMA AIRLINES may test an employee's specimen for the presence of other prohibited drugs or drug metabolites. At least two of the employee's supervisors, one of whom is trained in detection of the symptoms of possible drug use, shall substantiate and concur in the decision to test an employee who is reasonably suspected of drug use.

vii. Return to duty testing.

NESMA AIRLINES shall ensure that before an individual is returned to duty to perform a safety-sensitive function after refusing to submit to a drug test required or receiving a verified positive drug test result on a test conducted, the individual shall undergo a drug test. NESMA AIRLINES shall not allow an individual required to undergo return to duty testing to perform a safety-sensitive function unless NESMA AIRLINES has received a verified negative drug test result for the individual.

viii. Follow-up testing:

- NESMA AIRLINES shall implement a reasonable program of unannounced testing of each individual who has been hired to perform or who has been returned to the performance of a safety-sensitive function after refusing to submit to a drug test required by this chapter or receiving a verified positive drug test result .
- The number and frequency of such testing shall be determined by NESMA AIRLINES medical review officer. In the case of any individual evaluated and determined to be in need of assistance in resolving problems associated with illegal use of drugs, follow-up testing shall consist of at least six tests in the first 12 months following the employee's return to duty;
- NESMA AIRLINES may direct the employee to undergo testing for alcohol, in addition to drugs, if the medical review officer determines that alcohol testing is necessary for the particular employee; and Follow-up testing shall not exceed 60 months after the date the individual begins to perform or returns to the performance of a safety-sensitive function. The medical review officer may terminate the requirement for follow-up testing at any time after the first six tests have been conducted, if the medical review officer determines that such testing is no longer necessary.

5.5.13 Administrative and other matters.

i. Collection, testing, and rehabilitation records

NESMA AIRLINES shall maintain all records related to the collection process, including all logbooks and certification statements, for two years. NESMA AIRLINES shall maintain records of employee confirmed positive drug test results and employee rehabilitation for five years. NESMA AIRLINES shall maintain records of negative test results for 12 months. NESMA AIRLINES shall permit the ECAA representative to examine these records.

ii. Laboratory inspections

NESMA AIRLINES shall contract only with a laboratory that permits pre-award inspections by NESMA AIRLINES before the laboratory is awarded a testing contract and unannounced inspections, including examination of any and all records at any time by NESMA AIRLINES or the ECAA representative.

iii. Release of drug testing information:

NESMA AIRLINES shall release information regarding an employee's drug testing results, evaluation, or rehabilitation to a third party in accordance with the specific, written consent of the employee authorizing release of the information to an identified person, as part of an accident investigation.

iv. Refusal to submit to testing:

- NESMA AIRLINES shall notify the ECAA within 5 working days of any employee who holds a license issued under the ECARs who has refused to submit to a drug test required under this chapter; and
- NESMA AIRLINES are not required to notify the above office of refusals to submit to pre-employment or return to duty testing.

v. Permanent disqualification from service:

- An employee who has verified positive drug test results on two drug tests required by this chapter and conducted after September 1, 2001 is permanently precluded from performing for NESMA AIRLINES the safety-sensitive duties the employee performed prior to the second drug test.

- An employee who has engaged in prohibited drug use during the performance of a safety-sensitive function after September 1, 2001 is permanently precluded from performing that safety-sensitive function for Nesma Airlines.

5.5.14 Employee assistance program (EAP)

NESMA AIRLINES shall provide an EAP for employees. NESMA AIRLINES may establish the EAP as a part of its internal personnel services or NESMA AIRLINES may contract with an entity that will provide EAP services to an employee. Each EAP must include education and training on drug use for employees and training for supervisors making determinations for testing of employees based on reasonable cause:

i. EAP Education Program:

Each EAP education program must include at least the following elements: display and distribution of informational material; display and distribution of a community service hot-line telephone number for employee assistance; and display and distribution of NESMA AIRLINES policy regarding drug use in the workplace. NESMA AIRLINES policy shall include information regarding the consequences under the rule of using drugs while performing safety-sensitive functions, receiving a verified positive drug test result, or refusing to submit to a drug test required under the rule.

ii. EAP training program:

NESMA AIRLINES shall implement a reasonable program of initial training for employees. The employee training program must include at least the following elements: The effects and consequences of drug use on personal health, safety, and work environment; the manifestations and behavioral cues that may indicate drug use and abuse; and documentation of training given to employees and NESMA AIRLINES supervisory personnel. NESMA AIRLINES supervisory personnel who will determine when an employee is subject to testing based on reasonable cause shall receive specific training on specific, contemporaneous physical, behavioral, and performance indicators of probable drug use in addition to the training specified above. NESMA AIRLINES shall ensure that supervisors who will make reasonable cause determinations receive at least 60 minutes of initial training. NESMA AIRLINES shall implement a reasonable recurrent training program for supervisory personnel making reasonable cause determinations during subsequent years. NESMA AIRLINES shall identify the employee and supervisor EAP training in NESMA AIRLINES drug testing plan submitted to the ECAA for approval.

5.5.15 NESMA AIRLINES anti-drug program plan

i. Schedule for submission of plans and implementation:

- NESMA AIRLINES shall submit an anti-drug program plan to the ECAA for approval and must obtain such approval prior to beginning operations under the certificate. The program shall be implemented not later than the date of inception of operations. Contractor employees must be subject to an ECAA-approved anti-drug program within 60 days of the implementation of NESMA AIRLINES program;
- An entity or individual that holds a repair station certificate issued by the ECAA pursuant to Part 145 and employs individuals who perform a safety-sensitive function pursuant to a primary or direct contract with NESMA AIRLINES may submit an anti-drug program plan (specifying the procedures for complying with this chapter) to the ECAA for approval. Each certificated repair station shall implement its approved anti-drug program in accordance with the terms of this chapter
- Any entity or individual whose employees perform safety-sensitive functions pursuant to a contract with Nesma Airlines(as defined in this chapter), and any consortium may submit an anti-drug program plan to the ECAA for approval on a form and in a manner prescribed by the ECAA:
  - The plan shall specify the procedures that will be used to comply with the requirements of this chapter;
  - Each consortium program must provide for reporting changes in consortium membership to the ECAA within 10 working days of such changes; and
  - Each contractor or consortium shall implement its anti-drug program in accordance with the terms of its approved plan.
- Nesma Airlines, or contractor company that has submitted an anti-drug plan directly to the ECAA, shall ensure that it is continuously covered by an ECAA-approved anti-drug program, and shall obtain appropriate approval from the ECAA prior to changing programs (e.g., joining another carrier's program, joining a consortium, or transferring to another consortium).

i. NESMA AIRLINES anti-drug plan must specify the methods by which NESMA AIRLINES will comply with the testing requirements of this chapter. The plan must provide the name and address of the laboratory which has been selected by NESMA AIRLINES for analysis of the specimens collected during NESMA AIRLINES anti-drug testing program.

ii. NESMA AIRLINES anti-drug plan must specify the procedures and personnel NESMA AIRLINES will use to ensure that a determination is made as to the veracity of test results and possible legitimate explanations for an employee receiving a verified positive drug test result.

iii. NESMA AIRLINES shall consider its anti-drug program to be approved by the ECAA, unless notified to the contrary by the ECAA, within 60 days after submission of the plan to the ECAA.

5.5.16 Reporting of anti-drug program results

i. Annual reports of anti-drug program results shall be submitted to the ECAA in the form and manner prescribed by the ECAA by March 15 of the succeeding calendar year for the prior calendar year (January 1 through December 31) in accordance with the provisions below:

- NESMA AIRLINES shall submit an annual report each year;

- Each entity conducting an anti-drug program under an ECAA-approved anti-drug plan that has 50 or more employees performing a safety-sensitive function on January 1 of any calendar year shall submit an annual report to the ECAA for that calendar year; and
- The ECAA reserves the right to require NESMA AIRLINES not otherwise required to submit annual reports prepare and submit such reports to the ECAA. NESMA AIRLINES that will be required to submit annual reports under this provision will be notified in writing by the ECAA.

ii. Each report shall be submitted in the form and manner prescribed by the ECAA.

iii. Each report shall be signed by NESMA AIRLINES anti-drug (Q & S director) or other designated representative as a program manager.

iv. Each report with verified positive drug test results shall include all of the following informational elements.

- Number of covered employees by employee category;
- Number of covered employees affected by the anti-drug rule of another operating administration identified and reported by number and employee category;
- Number of specimens collected by type of test and employee category;
- Number of positive drug test results verified by an approved medical examiner by type of test, type of drug, and employee category;
- Number of negative drug test results reported by an approved medical examiner by type of test and employee category;
- Number of persons denied a safety-sensitive position based on a verified positive pre-employment drug test result reported by an approved medical examiner;
- Action taken following a verified positive drug test result(s), by type of action;
- Number of employees returned to duty during the reporting period after having received a verified positive drug test result on or refused to submit to a drug test required under the ECAA rule;
- Number of employees by employee category with tests verified positive for multiple drugs by an approved medical examiner;
- Number of employees who refused to submit to a drug test and the action taken in response to the refusal(s);
- Number of covered employees who have received required initial training;
- Number of supervisory personnel who have received required initial training; and
- Number of supervisors who have received required recurrent training.

v. Each report with only negative drug test results shall include all of the following informational elements. (This report may only be submitted by NESMA AIRLINES with no verified positive drug test results during the reporting year):

- Number of covered employees by employee category;
- Number of covered employees affected by the anti-drug rule of another operating administration identified and reported by number and employee category;
- Number of specimens collected by type of test and employee category;
- Number of negative tests reported by an approved medical examiner by type of test and employee category;

- Number of employees who refused to submit to a drug test and the action taken in response to the refusal(s);
- Number of employees returned to duty during the reporting period after having received a verified positive drug test result on or refused to submit to a drug test required under the ECAA rule;
- Number of covered employees who have received required initial training;
- Number of supervisory personnel who have received required initial training; and
- Number of supervisors who have received required recurrent training.

vi. An ECAA-approved consortium may prepare reports on behalf of individual aviation operators for purposes of compliance with this reporting requirement. However, the aviation NESMA AIRLINES shall sign and submit such a report and shall remain responsible for ensuring the accuracy and timeliness of each report prepared on its behalf by a consortium.

5.5.17 Employees located outside the territory of the Arab Republic of Egypt

i. No individual shall undergo a drug test required under the provisions of this chapter while located outside the territory of the Arab Republic of Egypt:

- Each employee who is assigned to perform safety-sensitive functions solely outside the territory of the Arab Republic of Egypt shall be removed from the random testing pool upon the inception of such assignment; and
- Each covered employee who is removed from the random testing pool under this paragraph A shall be returned to the random testing pool when the employee resumes the performance of safety-sensitive functions wholly or partially within the territory of the Arab Republic of Egypt.
- The provisions of this chapter shall not apply to any person who performs a function by contract for NESMA AIRLINES outside the territory of the Arab Republic of Egypt.

5.5.18 Drug test and ECAA enforcement action: - (Refer to ECAR 61.17/62.12/63.17/65.24/and 67.18)

a. Drug Testing for Psychoactive Substances:

(1) Definition: It is a test that examines a bodily specimen (as of urine, saliva, blood or hair) for the presence of one or more usually illegal or banned substances (such as cocaine, alcohol, methamphetamine or anabolic steroids).

(2) Applicants / License holders of all classes shall undergo a drug screening test as part of their initial /renewal medical examination. and they will not intend to exercise the privileges of their license and related rating while under the influence of psychoactive substance which might render them unable to safely and properly exercise these privileges.

(3) Applicant/License holder may be subjected to random test according to AME decision to indicate the use of Alcohol and /or psychoactive substances.

(4) Applicant / License holder shall not engage in any problematic use of substances.

(5) Drug testing shall screen for opioids, cannabinoids, amphetamines, cocaine, hallucinogens and sedative hypnotics. Following risk assessment performed by the competent authority on the target population, screening tests may include additional drugs.

(6) Samples (urine sample, …….) for drug testing shall be examined only by ECAA approved laboratories at Aero medical Council Central Administration

(7) Procedures for collecting urine samples to detect drug abuse is according to EACA 67.01 regulations

b. Positive Drug Testing: Drug testing results are positive for prohibited drugs in the following conditions:

1- Positive for cannabinoids, cocaine and / or hallucinogens.
2- Positive for sedative hypnotics , opioids and / or amphetamine proved to be for non Medical use
3- Refusal to submit to drug testing.
4- Leaving the Aeromedical council if a confirmatory test is required
5- Refusal or not comply with ECAA procedure for urine samples to detect drug abuse stated EAC 67-01

c. Consequences of Positive Drug testing:

1- A second sample is obtained at once for a confirmatory test in accordance with ECA76-01 regulations
2- A positive confirmatory test shall be followed by a full neuropsychiatric evaluation before fit assessment by AME.
   - If the drug test is negative and the candidate is properly evaluated by the neuropsychiatrist and the second stated that the applicant / License holder is no longer under influence or taking a prohibited drug for a non-medical or addiction use the applicant / License holder , he will be issued the license and subjected to follow up according to ECAA medical regulations.

- If not complied by (a) he or she will be denied their license and ECAA is notified to take the proper enforcement action .

1. A positive drug testing after confirmatory sample as in (B : 1 , 2 or as 3,4 and 5) the following shall be done :
   i. The applicant / certificate holder shall be notified immediately by e-mail, SMS, recorded phone massage or WhatsApp massage.
   ii. In case of rejecting the results the applicant / certificate holder has the right to appeal within 48 hours and upon his request; the objected sample shall be re-examined, and the results are final.
   iii. ECAA shall be officially notified with the final result for implementing the proper enforcement action according to related laws and regulations.

d. Enforcement:

(1) For first time (confirmed positive drug test) the ECAA will suspend the license for two years.

(2) For second time (confirmed positive drug test) the ECAA will revoke the license and the applicant cannot apply for any kind of aviation license

-Definitions:

- Suspended: temporary withholding the license.
- Revoked: completely termination (cancel) of the license.

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Chapter (6)
Appendices

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6.1 Safety Forms

6.1.1 Confidential /Hazard/Human Factor Report

Nesma Airlines	**Confidential / Hazard / Human Factor Report**	**Safety and Quality Department**

Existing Condition:

……...
……...
……...
……...
……...
……...
……...
……...
……...

Recommended Corrective Action:

……...
……...
……...
……...
……...
……...

Please detail existing condition and any recommended corrective action. Use additional sheets as necessary. Drop in safety suggestion box or mail to the safety department office. If you would like an update on any action, please provide your name and phone or address. Thank you for your interest in the flight safety.

Date: …../……/……   **Department:**

Name and phone No. (Optional)

Flight Safety Only

RCVD by:…………………………………………………………………

File No.:…………………………………………………………………

Assigned to:…………………………………………………………………

Issue No.: 1 **Issue Date: 1/10/2010**	**Page 1 of 1**	**Form No.: 302**

6.1.2 Voluntary Safety Report

Nesma Airlines نسما للطيران	**Voluntary Safety Report**	**Saf ty and Quality Department**

The information supplied in this form will only be used to enhance safety. You may to not provide your name. if you do provide your name. upon receipt of this form your name & position will be removed discarded. Under no circumstances will your identify be disclosed to any person in the airport or to any other organization, agency or person without your express permission.

When you have completed your part of the form, it should be given to the safety Manager or any member of the company safety committee. It may also be dropped in the drop boxes provided for the purpose at various locations.

Name (Optional;):…………………………………………………………………………………...

Position (Optional):……………………………………………………………………………………

(Name and position, if provided, to be discarded by the safety Manager before processing this form further)

PART A

TO BE COMPLETED BY THE PERSON IDENTIFYING THE HAZARD

Please fully describe the Hazard.

Date of Occurrence:……./………../……….. **Time:**……:……..:…….

Location of Hazard:…………………………………………………………………………………

Description:…………………………………………………………………………………………

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Suggestions of Corrective Actions:……………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

In your opinion, what is the likelihood of a similar occurrence happening again?

Rare **1**	**2**	**3**	**4**	**Likely** **5**

What do you consider could be the worst possible consequence if this occurrence did happen again?

Minor Damage **1**	**2**	**3**	**4**	**Catastrophic** **5**

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Nesma Airlines نسما للطيران	**Voluntary Safety Report**	**Safety and Quality Department**

PART B
TO BE COMPLETED BY THE SAFETY DEPARTMENT

The report has been de-identified and entered into the company database
Signature:……………………………………….. **Date:**………………………..
Name:……………………………………………
Rate the likelihood of the hazard recurring

Rare 1	2	3	4	**Likely** 5

Rate the worst – case consequences

Minor Damage 1	2	3	4	**Catastrophic** 5

What action is required eliminate or control the hazard and prevent injury.
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
Resources Required:
……………………………………………………………………………………………………
……………………………………………………………………………………………………
Responsibility for Action:
……………………………………………………………………………………………………
Referred to ……………………………….…..for further action.
Signature:…………………………...….. **Date:**……………………
Forwarded to the safety committee for review.
Signed:…………………………………… **Date:**……………………
Appropriate feedback given to the staff.
Signed:…………………………………… **Date:**……………………
Suggestions for corrective actions:
……………………………………………………………………………………………………
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Issue No.: 02 **Issue Date: Oct 2013**	**Page 2 / 2**	**Form No.: 303**

6.1.3 Cabin Crew Air Safety Report

Nesma Airlines نسما للطيران	**Cabin Crew Air Safety Report**	**Safety and Quality Department**
Please fill in appropriate spaces and check all items which apply to the event or situation		
Reporter		
Flight Segment Cabin Activity (Check at that apply)	Flight Origin …………………. Departure Time………………..	Destination………………….. Time since takeoff… ....(hh/mm)
Flight phase	**Weather**	**Lighting**
		Inside Cabin Outside Cabin
Event Characteristics		
Reporter's location in aircraft at time of event. Reporter's activity at time of event.		
Was a passenger directly involved in the event? Yes	Was fire / smoke involved in the event? Yes No	
Did this event result in an injury? Yes To passenger Yes To Crew? Yes	Was there an evacuation during or as a result of this event? Yes	
Issue No.: 01 **Issue Date: 1/10/2010**	**Page 1 / 2**	**Form No.: 304**

Nesma Airlines	**Cabin Crew Air Safety Report**	**Safety and Quality Department**

Describe Event / Situation

<u>CHAIN OF EVENT</u> How the problem arose? How it was discovered? Contributing Factors Corrective actions	**HUMAN PERFORMANCE CONSIDERATIONS** - Perceptions, judgment, decision. - Actions or inactions - Factors affecting the quality of human performance.
…………………………………………	…………………………………………
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Keeping in mind topic shown above discuss those which you feel are relevant and anything else you think is important including what you believe really caused.

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6.1.4 Reserved

Reserved

6.1.5 Risk Assessment Form

Nesma Airlines نسماللطيران	**Risk Assessment Form**	**Safety and Quality Department**

Type of Operation or activity	Generic Hazard	Specific Components of Hazard	Hazard – Related consequences	Existing Defenses to control risk (s) and risk index	Further action to reduce risk(s) and resulting risk index	Responsible Person
	Generated by:			Risk Index: Risk Tolerability	Risk Index: Risk Tolerability	

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6.1.5 Change Management Form

Nesma Airlines	**Change Management Form**	**Safety and Quality Department**

Type of Operation or activity	Type of Change	Specific Components of Hazard	Hazard – Related consequences	Existing Defenses to control risk (s) and risk index	Further action to reduce risk(s) and resulting risk index	Responsible Person
				Risk Index: Risk Tolerability	Risk Index: Risk Tolerability	

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6.1.5 Crew Interview Form

Nesma Airlines نسما للطيران	**Crew Interview form**	**Safety and Quality Department**

A/C Type:-	A/C Registration: SU-
Date:	Flight No.:-
Origin:-	Destination:-
Captain Name:-	F/o Name:-

Flight Phase	
Out Climb Cruise	
Specific Parameters Reviewed	
…………………………………………………………………………………………………… ……………………………………………………………………………………………………	

Review Date:	/ /	Signature
Chief Pilot Name:-		
Captain Name:-		
F/O Name:-		
Other Pilot:-		

Director of Operations:-		
Safety Manager:-		
Remarks: - …………………………………………………………………………………………………… ……………………………………………………………………………………………………		

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6.1.6 Pilot Briefing Form

Nesma Airlines نسما للطيران	**Pilot Briefing form**	**Safety and Quality Department**

Flight Safety Analysis:	
Event:	
Date: / /	
A/C:	
Pilot Name:	

Flight Phase	
☐ Engine Start	☐ Approach
☐ Taxi Out	☐ Final Approach
☐ Taxi Off	☐ Go around
☐ Initial Climb	☐ Landing
☐ Climb	☐ Taxi In
☐ Cruise	☐ Engine Shutdown
☐ Descent	☐ Other

Briefing Conclusion		
Review Date:	/ /	Signature:
Chief Pilot/Flight Safety Manager	/ /	
Pilot:	/ /	

Safety Manager
Remarks:

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6.2 Audit Checklists

NESMA AIRLINES Safety and Quality department will use the IOSA audit checklist as the approved checklists for performance the Quality and Safety audits on the company departments.

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6.3 Flight Data Analysis Program (FDAP)

1. Definitions

Accident: An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with intention of flight until such time as all such persons have disembarked, in which:

- A person is fatally or seriously injured as a result of:
  - Being in the aircraft;
  - 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 caused by other persons, or when injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
- 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 the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or the aircraft is missing or is completely inaccessible.

Notes:

1. For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.
2. An aircraft is considered to be missing when the official search has been terminated and wreckage has not been located.

As Low as Reasonably Practical (ALARP): means a risk is low enough that attempting to make it lower, or the cost of assessing the improvement gained in an attempted risk reduction, would actually be more costly than any cost likely to come from the risk itself.

Exceedance Detection: This looks for deviations from flight manual limits and standard operating procedures (SOPs). A set of core events should be selected to cover the main areas of interest to the operator. A sample list is provided at Appendix A of this CAAP. The event detection limits should be continuously reviewed to reflect the operator's current operating procedures.

Flight Data Analysis Program: A pro-active non-punitive program for gathering and analyzing data recorded during routine flights to improve flight crew performance, operating procedures, flight training, air traffic control procedures, air navigation services, or aircraft maintenance and design.

Hazard: A source of potential harm.

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

Risk: The chance of something happening that will have an impact on objectives.

Notes:

- A risk is often specified in terms of an event or circumstance and the consequence that may flow from it.
- Risk is measured in terms of a combination of the consequences of an event and its likelihood.
- Risk may have a positive or negative value.

Risk Assessment: The overall process of risk identification, risk analysis and risk evaluation.

Risk Identification: The process of determining what, where, when, why and how something could happen.

Safety: The state in which the probability of harm to persons or of property damage is reduced to, and maintained at, a level which is ALARP through a continuing process of hazard identification and risk management.

De-Identification: The process of hiding (*concealment*) what, where, when, why and how something happened.

Safety Management System (SMS): A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

Safety System: The application of engineering and management principles, criteria and techniques to optimize safety by the identification of safety related risks and eliminating or controlling them by design and/or procedures, based on acceptable system safety precedence.

2. Introduction

Historically the principal purpose of Flight Data Recorders (FDR) was to assist accident investigators to determine the cause of air crashes. This was possible by recovering the FDR and analyzing the recorded flight data. It also proved very useful in providing a better understanding of serious incidents. In the early 1970s a number of progressive operators appreciated the capabilities of FDRs and the valuable insights they could provide for the conduct of safe flight. Regularly gathering and analyzing flight data from the flight recorders revealed very useful information and provided operators the opportunity to understand more deeply what constituted a safe envelope for their flight operations. It also provided performance information of airframes and engines.

Today it is realized by aviation agencies and airlines alike that the practice of routinely analyzing recorded data from routine operations is a cornerstone in support of their accident prevention programs. Rather than reacting to serious incidents, operators have a very useful tool to proactively identify safety hazards and mitigate the risks.

A key element in developing any FDAP is gaining the support of the pilot group. This can be achieved by management and the pilot group entering a formal agreement or FDA procedure document. Amongst other things, the core conditions of the agreement will ensure that the program is non-punitive and de-identifies crew whilst ensuring the data gathered is secure.

ICAO, in recognition of the safety benefits of such programs, formally adopted their use and published a standard in Annex 6 Part I. It requires operators of air transport aeroplanes (more than 27 000 kg) to establish and maintain a FDAP (from 1 January 2005).

ECAR 121.5 and its guidance material EAC0011 provisions for a flight data analysis program to be part of Nesma airlines' safety management system.

3. Purpose

Nesma has a Flight Data Analysis Program that provides for the identification of hazards and the analysis of information and data associated with aircraft operations, to include:

a) Implementation of systematic processes for identifying and analyzing hazards and potentially hazardous conditions, to include:

- A systematic download and management of electronically recorded flight data from applicable aircraft.

b) Production of relevant analytical information and data for use by operational managers in the prevention of accidents and incidents, to include:

- Analysis of data that is performed in a consistent and standardized manner.
- Methods for detecting and analyzing events and data trends;
- Methods for developing and implementing corrective or remedial action to address adverse events or trends;
- A policy and/or procedures for ensuring remedial actions are taken in a non-punitive manner;
- The definition and application of safeguards that de-identify and ensure the security of program data and information.

4. FDAP Benefits

An FDAP is an essential element to a contemporary SMS. FDAP is used for the monitoring and analysis of flight operations and engineering performance data. Successful programs encourage adherence to SOPs and deter non-standard operations, consequently improving flight safety. They can also detect adverse trends in any part of the flight regime which can be mitigated by revision of SOPs, Air Traffic Control (ATC) procedures or understanding anomalies in aircraft performance.

FDAP is very useful in identifying exceedances of flight parameters that either indicate an underlying systemic issue or improper operating technique. This is established by comparing the specific flight to the fleet profile. For example, it would be possible to determine whether an unstable approach was an isolated event, or symptomatic of a wider mishandling problem due to a weakness in ATC procedures or improper flight management.

Flight data analysis can be used to detect flight parameter exceedances and to identify nonstandard or deficient procedures, weaknesses in the ATC system, and anomalies in aircraft performance. FDA allows the monitoring of various aspects of the flight profile, such as the adherence to the prescribed take-off, climb, cruise, descent, approach and landing SOPs. Specific aspects of flight operations can be examined to identify problem areas, or proactively prior to introducing operational change and subsequently, to confirm the effectiveness of the change.

During incident analysis, flight recorder data for the incident flight can be compared with the fleet profile data, thereby facilitating analysis of the systemic aspects of an incident.

Engine monitoring programs may utilize the automated analysis of flight recorder data for reliable trend analysis, as manually coded engine data are limited in terms of accuracy, timeliness and reliability. It is also possible to monitor other aspects of the airframe and systems.

In summary, FDA program offer a wide spectrum of applications for safety management, as well as improvements in operational efficiency and economy. Data aggregated from many flights may be useful to help:

- Determine day-to-day operating norms;
- Identify unsafe trends;
- Identify hazards in operating procedures, fleets, airports, ATC procedures, etc.;
- Monitor the effectiveness of specific safety actions taken;
- Reduce operating and maintenance costs;
- Optimize training procedures; and
- Provide a performance measurement tool for risk management programs

5. Objectives of FDAP

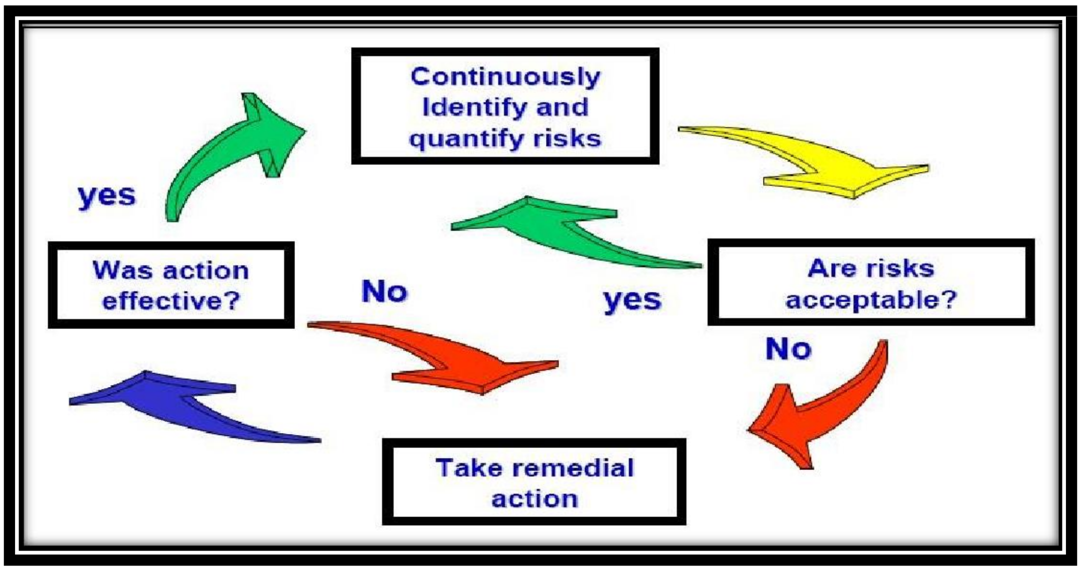
The primary objective of (FDA) is to enhance flight safety. This will be achieved by the routine monitoring of de-identified flight data. The FDA program is a non- punitive and contains adequate safe guards to protect data sources. The core objective and intent of Nesma Airlines FDA program is to facilitate the free flow of safety information.

FDAP will allow Nesma Airlines to:

- Collect operational flight data.
- Establish procedures for comparing the collected data to enhance safety in the following areas:

a) Flight procedures.
b) Flight training procedures and qualification standards
c) Crew performance in all phases of flight.
d) Air traffic control procedures.
e) Aircraft maintenance and engineering programs.
f) Aircraft and airport design and maintenance.

- Develop methods to analyze the collected flight data, such as triggered events and routine operational measurements.
- Perform trend analyses of FDA data to identify potential problem areas, evaluate corrective actions, and measure performance over time.
- Identify areas of operational risk and quantify current safety margins;
- Identify and quantify operational risks by highlighting when non-standard, unusual or unsafe circumstances occur;
- Use the FDAP information on the frequency of occurrence, combined with an estimation of the level of severity, to assess the safety risks and to determine which risks may become unacceptable if the discovered trend continues;
- Put in place appropriate procedures for remedial action once an unacceptable risk, either flight safety risk actually present or predicted by trending, has been identified; and
- Confirm the effectiveness of any remedial action by continued monitoring.



6. Using an FDAP

FDA data is commonly used today in a number of areas including:

- Exceedance detection;
- Routine measurements;
- Remedial Action;
- Incident investigations;
- Continuing airworthiness; and
- Integrated SMS.

6.1 Exceedance detection or triggered events

This looks for deviations from flight manual limits, and standard operating procedures. A set of core events should be selected to cover the main areas of interest to Nesma Airlines. NESMA AIRLINES Quality & Safety Director & Flight safety manager may also modify the standard set of core events (in accordance with the agreement with the chief pilot and the flight operations director) to account for unique situations regularly experienced, or the SOPs used.

They may also define new events (with the agreement of the pilots) to address specific problem areas.

Example: Restrictions on the use of certain flap settings to increase component life.

Care must be taken that, in order to avoid an exceedance, flight crew does not attempt to fly the FDA profile rather than follow SOPs. Such an action can quickly turn a poor situation into something worse.

All triggered Flight Events are extracted from AirFase Software after being compiled on monthly basis.

The event detection limits must be continuously analyzed and reviewed to reflect Nesma Airline's current operating procedures.

Some triggered events may include:

- Excessive pitch on takeoff;
- Climb out speed low or high during takeoff; and
- Excessive rate of descent below 1000 feet

6.2. Routine measurements

Ideally, data should be retained from all flights. At the very least a sufficient selection of measures will be taken from the fleet to ensure that normal practice is defined. Data will be recovered sufficiently frequently to enable significant safety issues to be considered and then mitigated. This may be accomplished by retaining select parameters at a given point in space. For example:

- Climb speed at 400 AAL;
- Flap retraction altitude/speed;
- Gear extension altitude/speed;
- Airspeed at 1000 feet AAL on approach; and
- Rate of descent at 1000 feet AAL on approach.

A comparative analysis can then be made between any given flight and the established profile for normal procedures. Undesirable trends may be identified before there are statistically significant numbers of events. Emerging trends and tendencies are monitored before the trigger levels associated with exceedances are reached.

6.3. Remedial Action

6.3.1 Remedial Action Policy:

It is important that the FDA program clearly defines the meaning of a non-punitive environment, or what is commonly known as a Just Culture, and that relevant program participants, particularly flight crew members:

- Have a clear understanding of the types of operational behaviors that are unacceptable, and the conditions under which disciplinary action would or would not apply.
- Are provided with enough information about the process to ensure a perception of fair treatment in accordance with program policy and procedures.
- Have confidence that non-punitive (or Just Culture) principles will be applied in the treatment of events identified under the FDA program.
- Within an FDA program, the application of non-punitive (or Just Culture) principles typically includes assurance that:

- Flight data and other relevant information are analyzed thoroughly such that, as far as reasonably practicable, all relevant factors associated with an event are identified, not just the action or inaction of specific individuals.
- Investigation of FDA events focuses on systemic issues that might influence behaviors, rather than on individual actions.
- Individuals involved in the investigation of an event will be treated fairly based on the quality of their behavioral choices.
- Factual details of an event are provided to relevant operational managers so that they may conduct a Just Culture review.

6.3.2 Mitigation Action Process

Determination of Mitigation action(s) shall follow the following process:

- Occurrence/Incident/Event/Event-Trend deep analysis by Flight Safety Office.
- Prepare a full report to include:

1. Risk Assessment Form – referred to as RA by Flight Safety Office
2. Event/Hazard/Occurrence repetition profile, covering RA Period
3. Event/Hazard/Occurrence actual captured value along with Event Min, Med and High values.
4. Event/Hazard/Occurrence top sponsors. This step is used to check if the event repetition circumstances (for specific airport, Sector, aircraft, PF, PIC or any other Event/Hazard/occurrence contributing factors.). <u>This step – by all means – shall not be included in Event/Hazard/Occurrence Risk Assessment Form. In other words, it is part of Safety Office internal analysis.</u>
5. Any previous mitigation action(s) with the concerned pilot and count of that mitigation action(s) with respect to the Event/Hazard/Occurrence in question. <u>This step – by all means – shall not be included in Event/Hazard/Occurrence Risk Assessment Form. In other words, it is part of Safety Office internal analysis.</u>

- Get the required Mitigation action regarding the concerned Pilot with respect the event in question taking into consideration application of SHELL Model and Balance between Safety and production.

- Determine the required Level of Mitigation Action. Levels of Mitigation actions as described in "Flight Safety Recommended Action" Report as follows:

1. No Action
2. Issue FCAN (Flight Crew Administrative Notice) for all pilots by Operations Department (Through FCAN Form)
3. Issue FCON (Flight Crew Operational safety Notice) for all pilots by Flight Safety Office. (Through FCON Form)
4. Pilot Briefing regarding the concerned event. (Through a Lecture/Discussion or through a Pilot Briefing Form)
5. The briefing is performed by Flight Safety Manager and attended by concerned pilot and chief pilot.
6. Pilot Interview (Investigation) performed by Flight Safety Manager and attended by concerned pilot and chief pilot and Operations Director. (Through Investigation Form)
7. Training (Course or SIM) preceded by Pilot Interview (Investigation).

- Issue "Flight Safety Recommended Action" Report including the required mitigation action and comments by Flight Safety Office.
- Mitigation Action Follow up regarding Event/Hazard/Occurrence as closed loop.

At any point the concerned pilot in question who is subject to formal Investigation, is freely allowed to invite for investigation participation – by his side - a legal person or highly experienced pilot according to his choice to attend the formal investigation. The latter name, ID and title shall be mentioned and recorded within the investigation report along with his signature.

6.4. Incident investigation

FDR data should be used in any investigation following an event that is considered to be an Immediately Reportable Matter. It has been found to be very useful in supplementing the flight crew report and will quantify impressions and information. System status and performance can also be determined, which may disclose cause and effect.

Nesma Airlines must retain flight recorder data following an Immediately Reportable Matter. In such instances, it is the responsibility of the CAA to investigate such matters and determine the seriousness of the occurrence and the circumstances. The usual program protocol of data confidentiality will probably not apply.

Examples of situations where recorded data could be useful:

i. Emergencies, such as:
- High-speed rejected take-offs;
- Flight control problems; and
- System failures;

ii. High cockpit workload conditions as verified by such indicators as:
- Late descent;
- Late localizer and/or glide slope interception;
- Large heading change below a specific height; and
- Late landing configuration;

iii. un-stabilized and rushed approaches, glide path excursions, etc.;

iv. exceedances of prescribed operating limitations (such as flap limit speeds, engine over-temperatures, V-speeds, and stall onset conditions; and

v. wake vortex encounters, low-level wind shear, turbulence encounters or other vertical accelerations.

6.5. Continuing airworthiness

Both routine and event data can be utilized to assist the continuing airworthiness function. For example, engine-monitoring programs look at measures of engine performance to determine operating efficiency and predict impending failures.

Examples of continuing airworthiness uses: engine thrust level and airframe drag measurements; avionics and other system performance monitoring; flying control performance; brake and landing gear usage.

6.6. Integrated safety analysis

The FDA database should be linked to other safety databases. These might include technical fault reporting systems and incident reporting systems. A more complete understanding of events becomes possible by cross-referencing the various sources of information. The confidentiality of the FDR data must be assured when databases are shared in this way.

The integration of all available sources of safety data provides the company SMS with viable information on the overall safety health of the operation.

For example, a flap over-speed results in:

- A crew report (provides the context);
- An FDA event (provides the quantitative description); and
- An engineering report (provides the result).

7. Conditions for effective FDA program

Several conditions that are fundamental to successful FDA programs are discussed below:

7.1 Protection of FDA data

- Airline management and pilots both have legitimate concerns regarding the protection of FDA data, for example:
  - Use of data for disciplinary purposes;
  - Use of data for enforcement actions against individuals or against the company, except in cases of criminal intent or intentional disregard of safety;
  - Disclosure to the media and the general public under the provisions of State laws for access to information; and
  - Disclosure during civil litigation.
- The integrity of FDA programs rests upon protection of the FDA data. Any disclosure for purposes other than safety management can compromise the voluntary provision of FDA data, thereby compromising flight safety. Thus, preventing the misuse of FDA data is a common interest of the State, the airlines and the pilots.

7.2 Essential trust

7.2.1 FDAP Safeguarding and de-identification

Refer to 13.7 of this Section.

As with successful incident reporting systems, the trust established between management and pilots is the foundation for a successful FDA program. This trust can be facilitated by:

- Early participation of the pilots' association in the design, implementation and operation of the FDA program;

- A formal agreement between management and the pilots, identifying the procedures for the use and protection of data.; and
- Data security and management.

7.2.2 The Confidentiality Protocol

The confidentiality protocol is a process for operating an effective Flight Data Monitoring (FDM) program whilst, at the same time, protecting the identity of the data to the fullest extent possible. The process is asfollows:

1. The Flight Safety Officer along with Flight Operation and Flight Training department has a prepared list of the most critical AIRFASE flight parameters,
2. Every flight sector in the AIRFASE database will be compared against this list, and FD Analyzer will filter those sectors and its' associated events that fall into the 'Unacceptable' category of exceedance. The 'Unacceptable' flight events will be reviewed by Flight Safety Officer, who is trained to analyze the data,
3. The Flight Safety Officer, acting independently, will contact the pilot(s) concerned
4. They will together view and discuss the triggered events/event trend and/or playback of the AIRFASE data, and It is expected that the fault (exceedance) will thereafter be self-corrected. However, if an individual is seen as continuing a trend of an 'Unacceptable' event, a proper remedial action will be set in motion. This will inevitably require the knowledge of Chief Pilot who will need to sanction additional training.
5. In some cases, when feedback is required – for specific follow up purposes - from one or more crew members regarding some aircraft operation issues which cannot be monitored by AirFase, the identity of such crew members giving the feedback shall be kept de-identified at all times with no exception.

The Flight Safety Office will not identify Flight Crew involved in Safety events except for the following:

1. If the event is reported via an Air Safety Report,
2. In the case of repeated events by the same pilot reported to members of Safety Committee and in which the Chairman of Committee feel extra training would be appropriate, and

3. In other cases of repeated events by the same pilot; or a single pilot- induced event reported by the Safety Department to the members of Safety Committee and which the Chairman of the committee deems of such severity that the aircraft was seriously hazarded, or another flight would be if the pilot repeated the event.

7.2.3 Requisite safety culture

Consistent and competent program management characterizes successful FDA programs. Indicators of an effective safety culture include:

- Top management's demonstrated commitment to promoting a proactive safety culture,
- A non-punitive company policy. (The main objective of the FDA program must be to identify hazards, not to identify individuals who may have committed an unsafe act.);
- FDA program management by a dedicated staff within the safety department in coordination with operations departments, with a high degree of specialization and logistical support;
- Potential risks are identified through the correlation of the results of the analysis by persons with appropriate expertise. (For example, pilots experienced on the aircraft type being analyzed are required for the accurate diagnosis of operational hazards emerging from FDA analyses.);
- An efficient communication system for disseminating hazard information (and subsequent risk assessments) to relevant departments and outside agencies to permit timely safety action.

7.2.4 Program Review (Refer to SMM 1.4.2)

FDA program effectiveness is continually assessed. In other words, day after day, month after month to assess the effectiveness of program component and elements after taking the following inputs into consideration – for the overall FDAP analysis and assessment purposes:

1. FDAP stated goal achievement.
2. Safety Performance Indicators.
3. Identification of potential areas of improvement
4. FDAP data management, policies, methods and procedures
5. Other inputs

The Program review analysis end result shall construct an input for program development and enhancement after discussion with program stackholders.

8. FDA Team

FDA programs are often viewed as one of the most expensive safety systems in terms of the initial outlay, software agreements and personnel requirements. In reality, they have the potential to save the company considerable money by reducing the risk of a major accident, improving operating standards, identifying external factors affecting the operation and improving engineering monitoring programs.

Experience has shown that the "team" required to run an FDAP could vary in size from one person with a small fleet (e.g. 5 aircraft), to a dedicated section for large fleets. The descriptions below identify various functions to be fulfilled, not all of which need a dedicated position. For example, engineering may provide only part time support. All FDA team members require appropriate training or experience for their respective area of data analysis. Each team member must be allocated a realistic amount of time to regularly spend on FDA tasks. With insufficient available manpower, the entire program will under-perform.

Team leader (Quality & Safety Director (Team Leader)). Team leaders must earn the trust and full support of both management and flight crews. They act independently of other line management to make recommendations that will be seen by all to have a high level of integrity and impartiality. The individual requires good analytical, presentation and management skills.

Flight Safety Manager. This person may be a current pilot (or perhaps a recently retired senior Captain or trainer), or someone who knows the company's route network and aircraft. They will have in-depth knowledge of SOPs, aircraft handling characteristics, airfields and routes will be used to place the FDA data in a credible context, and he also cross-references FDA information with other air safety monitoring programs (such as the company's mandatory or confidential incident reporting program, and LOSA) creating a credible integrated context for all information. This function can reduce duplication of follow-up investigations.

Flight Safety Officer FDAP Functions

Flight Safety Officer is a practicing non-Operations management pilot trained to analyses and interpret DFDR/QAR data. His task is to act as an independent witness to the content of DFDR/QAR playbacks and adviser to pilots whose DFDR/QAR playbacks show non-standard performance. The data is first extracted from the main AIRFASE database and technically verified by the Flight Safety

Office. Initially, only those sectors, to which AIRFASE has attached red flags, will be selected for review by the Flight Safety Officer. The Flight Safety Officer then performs his own quality check on the content of the data before calling the pilots concerned to come and see and discuss the data themselves. The worldwide experience of other companies shows that this method is sufficient to cause pilots to avoid repetitions of non-standard practices in the future. This usually leads to an overall improvement in Operations Quality Assurance. However, if a pilot displays a trend of non-standard practice the Flight Safety Officer must act in accordance with the rules for disclosure above. In any case, the Flight Safety Officer must act in accordance with the confidentiality protocol.

Terms of Reference for the Flight Safety Officer

The specific tasks and General Responsibilities of a Flight Safety Officer are as follows:

- Confirm AIRFASE events for operational validity,
- Review high risk events in detail and contact flight crews as necessary,
- Strictly apply the rules for disclosure of DFDR/QAR data,
- Strictly observe and practice the terms of the confidentiality Protocol,
- Participate in the production of statistical reports and safety trend,
- And risk analysis,
- Include operational comments and suggestions in reports when appropriate,
- Counsel pilots as necessary and in private when jointly viewing DFDR/QAR data, and
- In all matters upon which he cannot judge himself, he should refer to the Head of Safety and Quality.

Technical interpreter. This person interprets FDA data with respect to the technical aspects of the aircraft operation. They are familiar with the power plant, structures and systems, the company’s requirements for information and any other engineering monitoring programs in use by the airline.

Flight safety assistant. This person provides full assistance to the flight safety manager in the FDA program processes

Chief Pilot / Training Manager. This person provides the link between the fleet or training managers and flight crew involved in circumstances highlighted by FDA. The position requires good communication skills and a positive attitude towards safety education. The person is normally a representative of the flight crew association and should be the only person permitted to connect the identifying data with the event. The aircrew representative requires the trust of both crewmembers and managers for their integrity and good judgement.

Engineering technical support. This person is normally an avionics specialist, involved in the supervision of mandatory serviceability requirements for FDR systems. They must be knowledgeable about FDA and the associated systems needed to run the program.

Replay administrator. This person is responsible for the day-to-day running of the system, producing reports and analysis. Methodical, with some knowledge of the general operating environment, this person keeps the program moving.

To be effective, team personnel that perform FDA functions specified in this section would typically have the following background, skills and/or capabilities:

Typical qualifications for Flight Safety Manager would include:

- Good management, analytical, presentation, diplomatic skills;
- A working knowledge and understanding of flight operations;
- The ability to effectively liaise with senior management and flight operations personnel (including flight crews), as well as with representatives from maintenance, safety, training, and applicable professional associations;
- Formal training or background experience in data processing, statistics and trend analysis.

8.1 FDA Team Training Policy and Process:

In general, selection of FDAP personnel training process will following the following policy:

- Personnel selection;
- Function-Related training courses;
- On Job Training - OJT;
- Show ability to perform function tasks - under supervision;
- Final Acceptance

Process breakdown:

1. When more resources are required to support more FDAP workload demand, Safety and Quality Department will announce the need for more resources to fulfill specific FDAP functions.

2. FDAP functions applicants shall be interviewed, evaluated – as an initial step - according to FDAP function required skills (Computer usage, Excel, word, English Language, …)
3. Accepted applicants shall go through specific formal training relevant to FDAP function qualification requirements. (Data Retrieval, validation, processing, animation …)
4. An On Job Training OJT – under supervision – shall be set in motion to train newly joined personnel on what, how and when to perform the assigned tasks to highest level possible.
5. By the end of OJT – newly joined personnel shall be assessed with respect to their ability to perform the assigned tasks to required level and precision.
6. More OJT under supervision – if required.
7. Final Acceptance of personnel.

8.2 FDA Team Training Requirements

FDAP personnel will receive training – when applicable - on the AIRFASE software and Database Development, the training will include:

- Memory cards data download process
- The ways of data processing
- Flight data analysis
- Reporting
- Flight animations

Additionally, other training will be provided as new hardware and/or software is added to the program.

9. FDA Equipment Requirements

FDA programs generally involve systems that capture flight data, transform the data into an appropriate format for analysis, and generate reports and visualization to assist in assessing the data. The level of sophistication of the equipment can vary widely. Typically, however, the following equipment capabilities are required for effective FDA program:

i. An on-board device to capture and record data on a wide range of in-flight parameters (as altitude, airspeed, heading, aircraft attitude, and configuration);
ii. A means to transfer the data recorded on board the aircraft to a ground-based processing station. In the past, this largely involved the physical movement of the memory unit from the

quick access recorder (QAR) (either tape, optical disc, or solid state). To reduce the physical effort required, later transfer methods utilize wireless technologies;

iii. a ground-based computer system (using specialized software) to analyze the data (from single flights and/or in an aggregated format), identify deviations from expected performance, generate reports to assist in interpreting the read-outs, etc.;

iv. AirFase Software with capability:

- For flight animation capability to integrate all raw data, presenting it as a simulation of in-flight conditions, thereby facilitating visualization of actual events.
- To Convert raw flight data into usable data for analysis;
- To Provide data quality checks to detect abnormalities;
- To Manage data de-identification;
- To Process data for event and exceedance detection, routine data measurement, event investigation and continued airworthiness investigation;
- To produce information and reports for trend analysis and follow-up action;
- Keeping Database(s) for data retention and retrieval.

9.1 Ground Equipment

The Engineering team uses HHDLU for downloading FDR data from aircraft and uses PCMCIA card for retrieving QAR files from MPC (Multi-Purpose Computer). Safety department uses AIRFASE a flight data analysis system for processing and analysis of FDR/QAR data. AIRFASE Flight data analysis system is programmed with threshold limits for a wide range of flight events, and, as far as possible, these limits reflect the Standard Operating Procedures (SOP) of the company and manufacturer. The system therefore detects and shows alert flags for non-standard events together with exceedances of aero plane limitations. Flight Data Analysis system stores raw and processed data in its database. List of Exceedances with limits (High, Med and Low) is ref. to 8.11 of this chapter.

9.2 The Flight Safety Analysis Program Tools are:

Flight data monitoring software

Nesma Airlines operates an approved Flight Data Monitoring System, which based on the regulatory guidelines and Industry best practices.

Nesma Airlines has a 100% flight data monitoring policy. Data monitoring is pro-active and non-punitive.

Flight data is routinely downloaded from all aircraft, processed through an AIRFASE and stored in its database for viewing by the Flight Safety Office.

Nesma Airlines flight data monitoring program, that is non-punitive and contains adequate safeguards to protect data sources, includes a systematic acquisition, correlation and analysis of flight information derived from observations of flight crew performance during normal line operations and a combination of some or all of the following sources:

- Flight Data Analysis software;
- Confidential flight and Operational Air Safety reports (Ref. SMS Ch.7);
- Flight crew interviews;
- Quality assurance findings (Ref. Quality Assurance Program);
- Flight crew evaluation reports;
- Aircraft engineering and maintenance reports

9.2.1 AIRFASE Navigation Process

1. Processing
2. Analysis
3. Reporting
4. Flight Replay
5. List and Trace
6. FAP Editor
7. Airport Visualization
8. Settings Manager
9. Fleet Manager
10. Support (link to support contact information)

The following figure shows AIRFASE Navigation Page which used to gain access to the various parts of the AIRFASE system.

9.2.1.1 Processing

Processing is used to import raw data files from flight recorders into the AIRFASE system, and to manage the process life cycle.

9.2.1.2 Analysis

Use analysis to sort through events, graph trends and explore flight recorder data with a variety of tools. You can save the graph definitions for use in automatically generated reports. The filters can be configured to include a time period relative to when the report is run, making the report current as of the time it is generated. Flight data analysis is covered in several chapters.

9.2.1.3 Reporting

Define reports (a collection of charts which graphically display aggregate flight information for a defined group of flights, aircraft etc. over a defined time period).

Automatically generate reports according to a periodic schedule.

Allow you to manually generate reports. The reporting system has three primary purposes:

9.2.1.4 Flight Replay

Flight replay allows you to view the raw data of an entire flight or a portion of the flight using displays such as an instrument panel, list of events, 3-D view of the airplane, and configuration displays.

9.2.1.5 List and Trace

List and Trace displays multiple flight parameters in both tabular and graphical formats

9.2.1.6 FAP Editor

Use the FAP editor to make adjustments to existing FAPS and make new ones. The FAP specifies the conversion of raw flight data to engineering units and triggered events.

9.2.1.7 Airport Visualization

Airport Visualization displays the flight path of one or more flights. You can install a variety of maps, and choose the one to display as an underlay for the flight path. Labels the flight path at key points such as where events occur and approach information.

9.2.1.8 Settings Manager

The Settings Manager allows you to add and remove users, set their access level and define group access levels. Allows you to configure the AIRFASE installation (defining paths to working directories, setting de-identification etc)

9.2.1.9 Fleet Manager

The Fleet Manager allows you to define all aspects of your airline's fleet, including aircraft types, aircraft configurations, individual aircraft, airports, recorder types and media.

**** For further software usage, please refer to AirFase user guide manual.**

10. FDA closed-loop process

Typically, Nesma airlines followed a closed-loop process in applying an FDA program as follows:

i. **Baseline established.** Initially, Nesma airlines establish a baseline of operational parameters against which changes can be detected and measured.

<u>Examples</u>: Rate of unstable approaches, or hard landings.

ii. **Unusual or unsafe circumstances (exceedance) highlighted.** The user determines when nonstandard, unusual or unsafe circumstances occur; by comparing them to the baseline margins of safety, the changes can be quantified.

<u>Example</u>: Increases in unstable approaches at particular locations.

iii. **Unsafe trends identified.** Based on the frequency of occurrence, trends are identified. Combined with an estimation of the level of severity, the risks are assessed to determine which may become unacceptable if the trend continues.

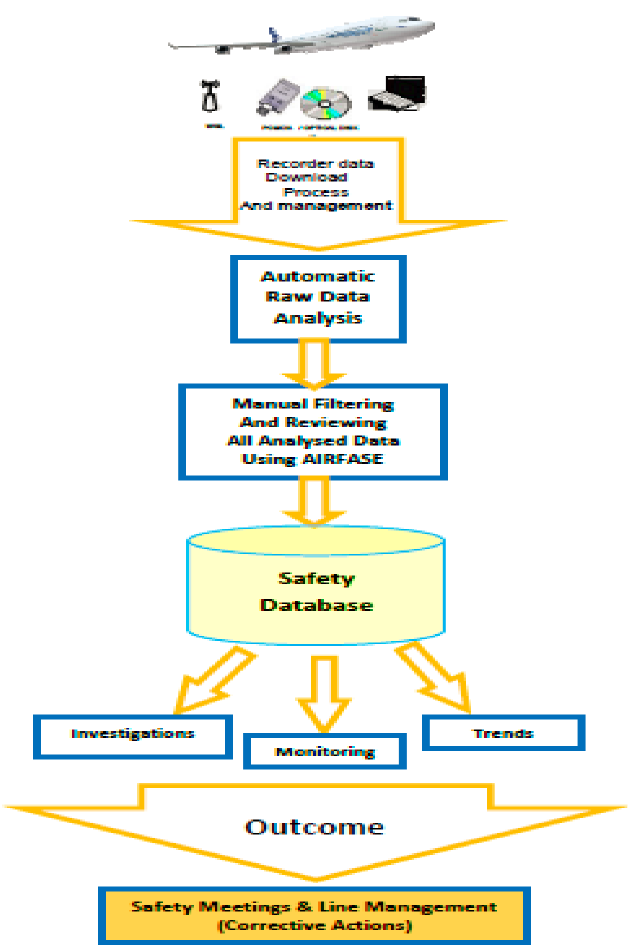
Example: A new procedure has resulted in high rates of descent that are nearly triggering GPWS warnings.

iv. **Risks mitigated.** Once an unacceptable risk has been identified, appropriate risk mitigation actions are decided and implemented.

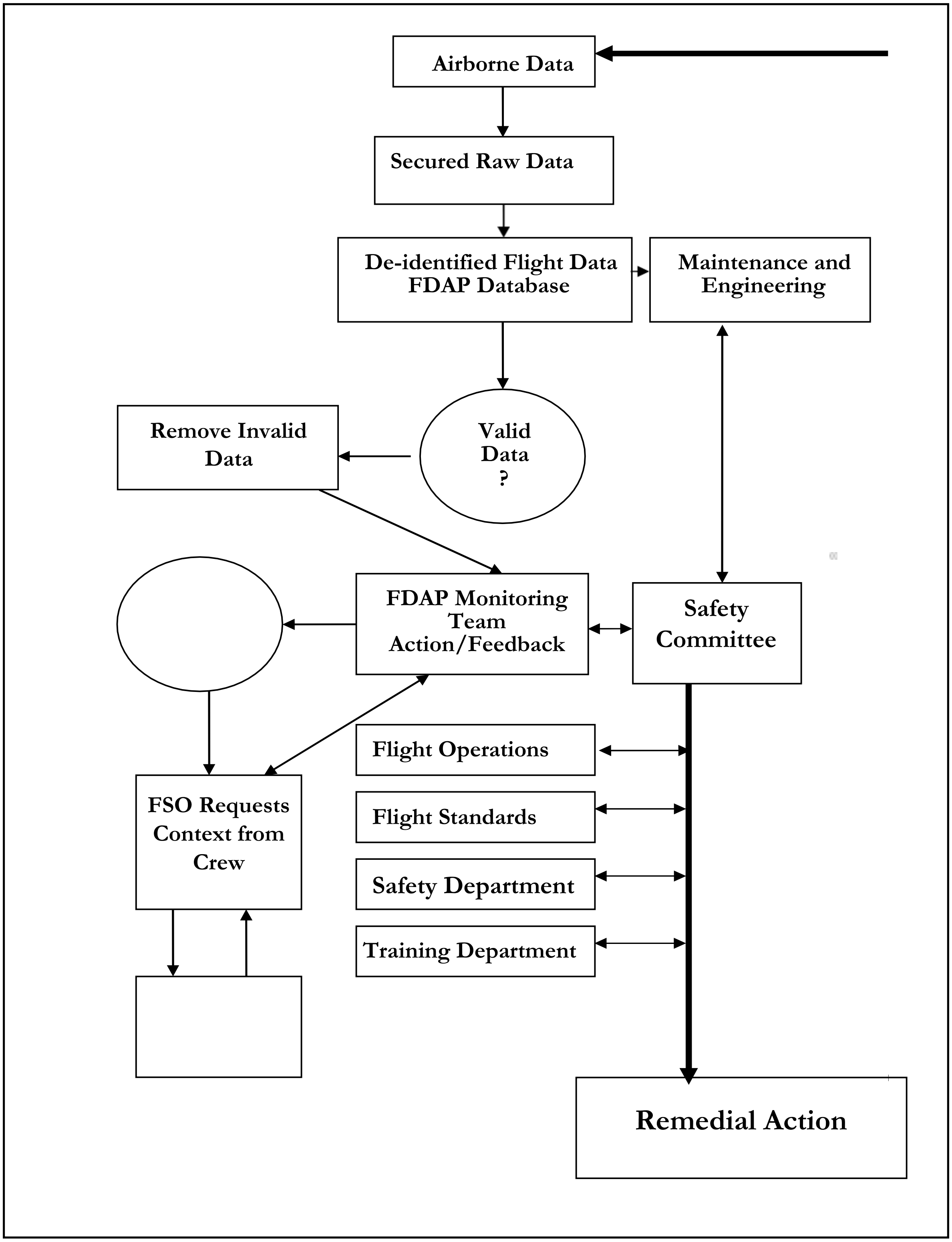
Example: Having found high rates of descent, the SOPs are changed to improve aircraft control for optimum/maximum rates of descent.

v. **Effectiveness monitored.** Once a remedial action has been put in place, its effectiveness is monitored, confirming that it has reduced the identified risk and that the risk has not been transferred elsewhere.

Example: Confirm that other safety measures at the airfield with high rates of descent do not change for the worse after changes in approach procedures.



e


Airborne Data
Secured Raw Data
De-identified Flight Data FDAP Database
Maintenance and Engineering
Remove Invalid Data
Valid Data ?
FDAP Monitoring Team Action/Feedback
Safety Committee
Flight Operations
Flight Standards
Safety Department
Training Department
FSO Requests Context from Crew
Remedial Action

11. Implementing FDAP

It would be expected that a start up airline would take a minimum of two years to implement an effective monitoring program. Implementation would need to be a phased approach:

- Negotiation and implementation of pilot agreements;
- Implement and audit of data security procedures;
- Installation of equipment;
- Selection and training of personnel; and
- Commencement of data collection for analysis.

It is also considered essential that the FDAP is integrated seamlessly within the SMS to maximize safety benefits. The data provided by the program will provide quantitative information to support investigations that would be otherwise based on subjective reports.

12. FDAP Aims and Objectives

Any successful project needs to define the direction and objectives of the work. A preplanned phased approach is recommended so that the foundations are in place for future expansion into other areas. A building block approach will allow expansion, diversification and evolution of the program through experience.

For example, start with a modular system looking initially at basic safety related issues only. In the second phase add engine health monitoring. Ensure all systems either being used, or to be used, are compatible for the purposes of the program.

Set both short term and long term goals. A staged set of objectives starting from the first week's replay, moving through early production reports into regular routine analysis, allows the program to systematically complete aims and goals.

For example:

- **Short term:**

– Establish data download frequency and procedures, test replay software and identify aircraft defects;

– Validate and investigate exceedance data; and

– Establish a user-acceptable routine report format to highlight individual exceedances and facilitate the acquisition of relevant statistics.

- **Medium term:**

– Produce an annual report - include key performance indicators;

– Add other modules to analysis (e.g. Continuing Airworthiness); and

– Plan for next aircraft fleet to be added to the program;

- **Long Term:**

– Network FDA information across all company safety information systems;

– Ensure FDA provision for any proposed advanced training program; and

– Use utilization and condition monitoring to reduce spares holdings.

Initially to prove the program's effectiveness it is useful to start with a modest monitoring schedule by targeting areas of known interest. A focused and disciplined approach is more likely to achieve the early aims and goals of the program that will lead to its success. For example, rushed approaches at certain airports, rough runways, high fuel usage on particular flight segments. Analysis of known problem areas is likely to generate useful monitoring methods for other locations and flight segments.

13. FDAP Procedures

The FDAP procedure document, or memorandum of understanding (MOU), is to be signed by all parties (airline management including the Flight Safety Manager and the Accountable Manager, flight crew member representatives nominated by the pilot union and the pilot association) will, as a minimum define:

- The aim of the FDAP;
- A data access and security policy that should restrict access to information to specifically authorized persons identified by their position;
- The method to obtain de-identified crew feedback on those occasions that require specific flight follow-up for contextual information; where such crew contact is required the authorized persons need not necessarily be the program manager, or safety manager, but could be a third party (broker) mutually acceptable to flight crew members representative and management;
- The data retention policy and accountability including the measures taken to ensure the security of the data;

- The conditions under which, on the rare occasions, advisory briefing or remedial training should take place; this should always be carried out in a constructive and non punitive manner;
- The conditions under which the confidentiality may be withdrawn (i.e. for reasons of gross negligence or significant continuing safety concern);
- The participation of flight crew member representative(s) in the assessment of the data, the action and review process and the consideration of recommendations; and
- The policy for the publishing the findings resulting from the FDAP.

13.1 Removal of Recording medium

Where older flight recording equipment is installed, and there is no opportunity to use a Quick Access Recorder (QAR) or equivalent to download data, Maintenance Department should coordinate the removal of the recording medium in harmony with maintenance schedules and/or routines. The removal time period should also coincide with recording medium memory capability and meet the Nesma Airline's need for a timely analysis of the data as defined in Nesma Airline's FDAP goals.

13.2 Procedure for the Movement of QAR and DFDR/QAR Discs

A. **Purpose:** To define processes for the movement of QAR and DFDR discs between the Engineering Department and the Safety Department and for the recording of information so as to enable control and tracking of the discs and flight data media files.

B. **Scope:** This process involves QAR data files, DFDR data on PCMCIA cards

C. Processes:

1. FDR/QAR data on PCMCIA Cards:

a) Engineering Department performs the data download from the aircraft FDR through a Hand Held Unit or retrieving QAR data on PCMCIA card fitted in MPC (Multi-Purpose Computer) during aircraft's weekly inspection.

b) FDR Downloaded data / PCMCIA Card handed over to MCC and FDR/QAR files will be uploaded to Safety-Security share folder on server. After uploading the data will be communicated to Safety team.

c) Further QAR files are uploaded to AIRFASE Server through automation and processed by AIRFASE software. FDR/QAR Data is Analyzed and validated by the FDR360 team and validated data will be made available for reviewing by Nesma team.

Procedure for Download and Process

Procedure for database Maintenance

Procedure for Technical Validation of Data and to Quantify Data Loss

Procedure for First Operational Filter (Red Flags)

Procedure for Investigation by Safety

Procedure for Investigation by Flight Safety Officer

Flight Safety Officer Records

Procedure for Trend Identification, Statistical Analysis and Risk Analysis.

Procedure for Preparation of Data for SAG.

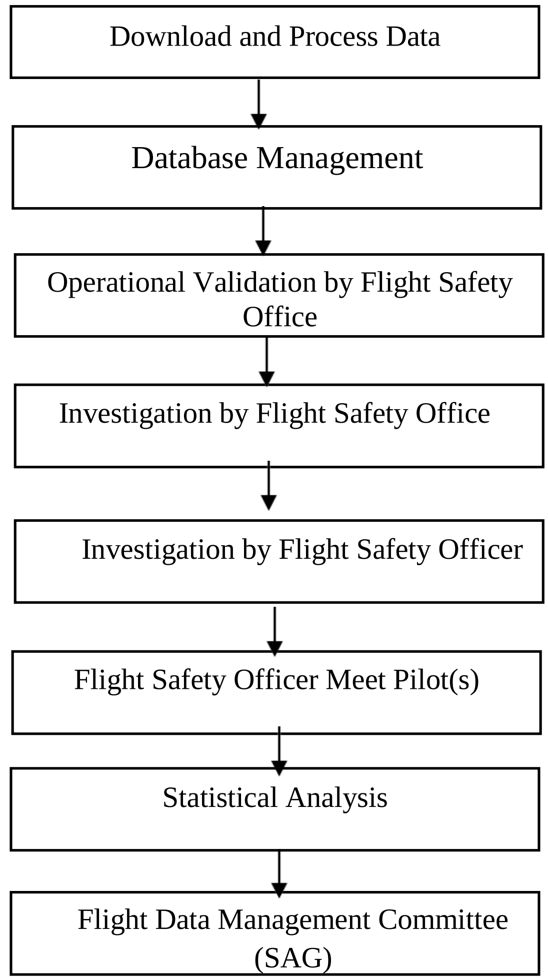


Figure 1 Flow Chart for the Movement of FDR/QAR Data

13.3 Procedure for Processing of FDR/QAR for Maintenance of the FDM Database

A. **Purpose:** To outline the general requirements for the processing of FDR/QAR and to outline the requirements for the maintenance of the FDM Database.

B. Processes:

1. **Processing**. In the act of processing FDR/QAR data, the objective must be not to lose any data either through mistake or through the vagaries of the processing software AIRFASE. Total data loss through the system from the aero plane to the database can be as high as 10%.
2. **Database Maintenance.** AIRFASE team will be updating database on receiving new Service bulletin from ATR, from time to time and update the respective parameters. Nesma engineering department will provide information to AIRFASE team as and when a new Service Bulletin is received from ATR.
3. **Data Storage.** In the FDM system, processed data is automatically removed after 360 days. Unprocessed data is to be retained for 5 years. A copy of raw data is available with engineering system as a backup.

13.4 Technical and Operational Validation of FDM Data

A. **Purpose:** To outline the procedures for validating FDM data, to eliminate errors caused by technical error and by human error during data processing.

B. **Scope:** This procedure outlines only the high-level tasks involved. A Local Safety Procedure covers the step-by-step detail.

C. Processes:

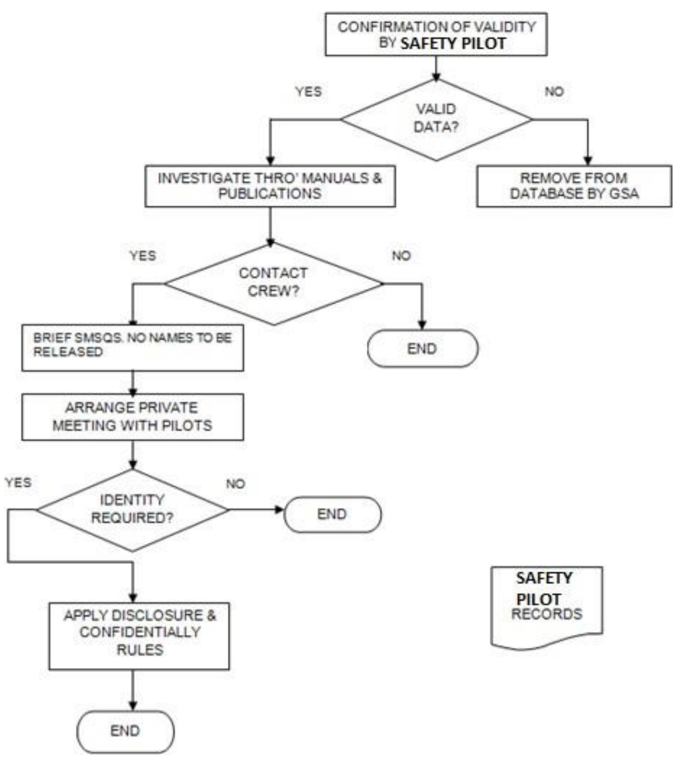
1. The overall process is performed in two stages. Firstly, a validation of data quality to ensure that all corrupted data is removed from the data newly inserted into the database. This inevitably leads to some loss, but a small amount of data may be recovered by processing the raw a second time. Secondly, a check is performed of all flights to ensure that the labeling of flights in the FDM database corresponds to the flights actually flown. This check ensures detection of error such as wrong aircraft registration, or wrong dates being entered on disc labels by engineering or within AIRFASE by the GSC during processing,

2. **Validation of Data Quality.**
3. The AIRFASE system automatically eliminates any flight which is not complete. However, in a few cases flights, which are incomplete, may still be retained by the system. AIRFASE team is responsible for data revalidation
4. **Validation of Data Labeling.**
5. For each aircraft registration, the FDM system, Operations and Crew Management System records of flight numbers, dates and times are compared. A mismatch indicates a possible error either on the QAR/FDR data uploaded into FDM system during processing or loss of flight data. A correction must be made, and the data re- processed as necessary. Loss of data of more than 10% on any particular aircraft will be immediately brought to the notice of avionics engineering department for necessary maintenance action of the QAR recorder.

13.5 Flight Safety Officer Investigation and Confirmation of FDM Data

A. **Purpose:** To depict the process for the Flight Safety Officer to select and confirm the flights that shows any high exceedances (red flags).

B. **Processes:** The processes are as shown below:



13.6 Standard Protocols for Crew Contact

For validated event, the Safety and Quality director is responsible for initiating the standard protocol.

13.6.1 Submitted ASR:

Prior to contacting air crews, the flight Safety Manger will check if an Air Safety Report (ASR) was filed. The flight Safety Manger investigation may cease and continue as an ASR investigation.

a. Where an ASR has not been received or its information had been omitted, but it is evident from the flight data recording that an event has been triggered, flight Safety Manger will contact the chief pilot to prepare an interview with this crew.
b. Responses received from crew members will be de-identified by flight Safety Manger prior to being reviewed by the safety and quality director and forwarded to departments concerned. Following the review process, it will be decided to whether close the matter or conduct further enquiries.
c. Where further enquiries are pursued the flight Safety Manger become involved if requested to interview other flight crew members, the main purpose of the enquiry is to determine the root cause of an event and to prevent a re-occurrence.

13.6.2 Crew Report

A. If any flight is reported by the chief pilot or a crew himself, flight Safety Manger will identify the reported flight for review.
B. Flight Safety Manger will contact the crew of the concerned flight.

13.6.3 Filling Forms

After interview is completed the crew will fill the crew interview form and it will be signed by chief pilot and the flight Safety Manger then reviewed by the safety and quality director for department recording system.

13.6.4 Data Validation Protocol

The procedures for validating, reviewing, and defining event and trend definitions will be established by the Safety and Quality director and the flight Safety Manger They will determine whether the information is valid and reflects NESMA AIRLINES standards, training practices, and aircraft performance limits. All changes in the event and trend definitions will be logged and the Safety and Quality Manager will maintain the records.

13.6.5 Information and Data Control

The Safety and Quality director and the flight Safety Manger will maintain a history of the information used in the department. When a FDA trend or safety issue is identified, a log will be maintained to provide a reference document. This document will provide a way to track how NESMA AIRLINES addresses trends revealed by analysis of the FDA data. This will include:

- A description of the identified issue.
- Analysis that was accomplished.
- Specific corrective actions or recommendations taken or made.
- Personnel who were notified (e.g., flight crews [de-identified], Engineering.
- Maintenance, Flight Operations, Flight Training, Flight Safety).
- Resolution of actions or recommendations.

13.7 Disclosure of DFDR/QAR Data

As per Safety Committee Recommendations and FDAP confidentiality protocol, Full access to DFDR/QAR data is available to selected personnel from Safety Department. All working stations (computers) that have AirFase software, are only accessed through login password(s). In addition, login to AirFase software itself shall also be through a predefined login password for each individual user. DFDR/QAR data may be identified only for the following reasons:

1. Accident,
2. When the PIC identifies himself by submitting an ASR,
3. When there is a complaint or allegation from an outside authority or agency,
4. When the PIC gives permission for identification,
5. When a serious departure from SOP is apparent and Flight Safety Office evaluates the event or even the whole flight as high risk and it has gone unreported by the crew involved. Then identification must be approved by the DFO before the incident/Event can be investigated, and Confidentiality may be withdrawn in cases such as willful misconduct and/or gross negligence.
6. when disclosed under the terms of the confidentiality protocol

13.8 Data Analysis and follow-up

Data Analysis and Follow-up process:

1. **Highlight Findings**: FDAP finding (e.g. hazards, adverse events and trends, airworthiness issues, etc.) shall be coordinated with relevant operational areas of Nesma Airlines for further validation and assessment – when required.
2. **Confirmation of Findings**: FDAP findings (e.g. hazards, adverse events and trends, airworthiness issues, etc.) are confirmed by relevant operational area(s) after being investigated – if required.
3. **Mitigation of Findings**: Determination of appropriate action to eliminate/correct such findings.
4. **Mitigation Action Application**: Follow-up of the determined appropriate action, i.e. applied as planned
5. **Feedback**: Assess/evaluate that highlighted finding(s) are eliminated/reduced/ corrected or not?

Data Analysis and Follow-up procedure:

i. FDA data are usually compiled on a monthly basis. The data should then be reviewed by Flight Safety Officer to identify specific exceedances and emerging undesirable trends (Refer to SMM Ch. 2) and to disseminate the information to flight crews.

ii. If deficiencies in pilot handling technique are evident, the information is de-identified in order to protect the identity of the flight crew. The information on specific exceedances is handled by flight safety manager for confidential discussion with the pilot. Then give advice and recommendations for appropriate action, such as re-training for the pilot (carried out in a positive and non-punitive way); revisions to operating and flight manuals; changes to ATC and airport operating procedures; etc.

iii. As well as reviewing specific exceedances, all events are archived in a database. The database is used to sort, validate and display the data in easy-to understand management reports.

iv. Lessons learned from the FDA program may warrant inclusion in the company's safety promotion programs. Care is required, however, to ensure that any information acquired through FDA is studiously de-identified before using it in any training or promotional initiative.

v. As in any closed-loop process, follow-up monitoring is required to assess the effectiveness of any corrective actions taken. Flight crew feedback is essential for the identification and resolution of safety problems and could comprise answering the following questions, for example:

- Are the desired results being achieved soon enough?
- Have problems really been corrected, or just relocated to another part?
- Have new problems been introduced?

vi. All successes and failures should be recorded, comparing planned program objectives with expected results. This provides a basis for review of the FDA program and the foundation for future program development.

vii. All maintenance related events will be reviewed with the chief inspector for verifying that the action taken was complies with recorded data.

13.9 Flight Safety Office FDA Reports:

- The Flight Safety officer and Flight Safety assistant will be responsible for developing reports summarizing the information obtained through the AIRFASE system including events' Risk Assessment, forecasted trends, deficiencies, findings and airworthiness issues.
- The reports will include summaries of the most recent information obtained as well as trend information to demonstrate the effectiveness of prior corrective actions.
- These reports will be presented to the Safety and quality director (usually on monthly basis) on a regular basis unless the situation dictates for shorter period. These summary reports shall be discussed within Safety Committee.
- The reports will include recommendations in order to improve their usefulness as the program proceeds.
- Flight Safety Office shall distribute FDAP summary reports – electronically - to concerned operational areas as required.

13.10 Record Keeping by Flight Safety Office

A. **Purpose:** To define the information to be recorded by Flight Safety Office and the rules governing the confidentiality and storage of the records.

B. **Scope:** This procedure applies to the Flight Safety Office.

C. Processes:

1. The FDM records maintained within AIRFASE by the Safety Department are identifiable. At the completion of Procedure on Technical and Operational Validation of Data by the Group Safety Office, the shortlist of flights offered to the Flight Safety Officer will still contain identifiable data. This data is protected and is accessible to safety staff and Flight Safety Officers,
2. Flight Safety Office shall also protect the records of their data investigation and confirmation,
3. Records of the names of pilots they have listed for playback viewing and discussion shall be kept in electronic format and only available to those working in the Safety Department and the Flight Safety Officers. Any notes made during the data investigation and confirmation, and any notes made at interviews shall be destroyed by shredding when those notes have been turned into the proper electronic record,
4. The Records to be maintained by the Flight Safety Officers are as follows:

a. A list of the pilots to be met for playback viewing and discussion, and

b. A record of every meeting with every pilot on separate forms. The format is maintained in an electronic database accessible to the Safety Department staff only.

c. Flight Safety Officer Records shall be retained for one year only. Flight Safety Officers are responsible for reviewing the records regularly and at a minimum of every two months, to ensure that records are not retained longer than one year.

Database

Nesma Airlines has an electronic database to ensure effective management of data derived from the flight safety analysis program.

LIST OF PARAMETER EXCEEDENCES A320 Family

(Please refer to Appendix xx)

14. FDA Event Definitions

The event list had been tailored to NESMA AIRLINES and its aircraft's type. The parameters used to measure the event need to be recorded on that aircraft type. Next, the tolerances that trigger the events should be set to account for applicable regulations, aircraft limitations, and company policies and procedures. The safety and quality department AIRFASE Team should work together to evaluate and adjust event triggers. Since maintenance will also be an important stakeholder.

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
101	Operational Exceedance	Training Flight	More than one approach				TRUE
109	Operational Exceedance	Incomplete Flight	Incomplete Flight	#	#	#	TRUE
110	Operational Exceedance	Phase Unknown Detected	Phase Unknown detected	#	#	#	TRUE
1005	Speed	Speed High in Approach (below 2500ft RA)	ALT_RADIO <2500ft Tol>=10sec CAS>	220 Kts	230 Kts	250 Kts	TRUE
1006	Speed	Speed Above VMO	CAS>	#	VMO + 4 knts; TOL>=3s	VMO + 4 knts; TOL>=6s	TRUE
1007	Speed	Speed Above MMO	MACH>:	#	MMO + 0.004 TOL<=3s	MMO + 0.004 TOL<=6s	TRUE
1008	Speed	Speed above VLO Retraction	CAS/MACH >; TOL >= 3s	#	#	220 kts	TRUE
1009	Speed	Speed Above VLE	CAS/MACH >; TOL >= 3s	#	#	280 Kts, 0.67 M	TRUE
1010	Speed	Speed High in Approach (at 1000ft)	CAS > VAPP:	+ 15 Kts	+ 20 Kts	+ 25 Kts	TRUE
1011	Speed	Speed Low in Approach (at 1000ft)	CAS < VAPP:	+ (-5) Kts	+ (-8) Kts	+ (-10) Kts	TRUE
1012	Speed	Speed High in Approach (at 500ft)	CAS >VAPP:	+ 10 Kts	+ 15 Kts	+ 20 Kts	TRUE
1013	Speed	Speed Low in Approach (at 500ft)	CAS <VAPP:	+ (-5) Kts	+ (-8) Kts	+ (-10) Kts	TRUE
1014	Speed	Speed High in Approach (at 50ft)	CAS >VAPP:	+ 8 Kts	+ 11 Kts	+ 15 Kts	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1015	Speed	Speed Low in Approach (at 50ft)	CAS <VAPP:	+ (-5) Kts	+ (-8) Kts	+ (-10) Kts	TRUE
1016	Speed	Speed above VLO Extension	CAS >	#	#	250 kts	TRUE
1017	Speed	Speed above VFE	CAS >; TOL >= 3s	#	VFE	VFE + 4 Kts	TRUE
1021	Speed	Speed above 250kts (below 10000ft)	CAS>255kts, TOL>10 seconds at 9500ft or FL95				TRUE
1022	Speed	Speed High at Touch down	CAS >:	VAPP + 0 Kts	VAPP + 5 Kts	VAPP + 10 Kts	TRUE
1023	Speed	Speed Low at Touch down	CAS <:	VLS -5 Kts	VLS -8 Kts	VLS -10 Kts	TRUE
1024	Speed	Speed Above Maximum Tire Speed	GS >; TOL >= 3s	#	#	195 Kts	TRUE
1025	Speed	Speed Above Recommended Turbulence Speed	ALT_STD ~ 20000; >:MACH>0.78M <:CAS>260kts	TOL >= 120 s	TOL >= 300 s	TOL >= 600 s	TRUE
1027	Speed	Rejected Takeoff Detected	CAS >:	50 Kts	80 Kts	100 Kts	TRUE
1028	Speed	Speed Low	CAS <; TOL >= 3s	VLS + (- 3) Kts	VLS + (- 7) Kts	VLS + (- 10) Kts	TRUE
1029	Speed	Braking Delayed at Landing	(Time to slow 50kts after slow 10kts since Land)>:	18 s	23 s	28 s	TRUE
1030	Speed	Taxi Speed High in straight line	GS	> 32 Kts	> = 35 Kts	> = 40 Kts	TRUE
1031	Speed	Taxi Speed High in Turn	GS >	15 Kts (Divide by 2 for U-Turn)	18 Kts (Divide by 2 for U-Turn)	21 Kts (Divide by 2 for U-Turn)	TRUE
1032	Speed	Speed High in Climb (below 1000ft)	ALT_AFE < 1000ft, PITCH < 15° and CASC > V2/VAPP +	30 kts	40 kts	50 kts	TRUE
1033	Speed	Tail wind at Landing (below 100ft)	Average tail wind from 100 to 0ft >:	8 kts	11 kts	15 kts	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1034	Speed	Questionable VAPP in Short Final	VAPP >:	VLS	VLS + 20 kts	VLS + 25 kts	TRUE
1035	Speed	Braking Questionable at Landing	LONG_ACC>: TOL >= 3s	-0.35G	-0.40G	-0.45G	TRUE
1038	Speed	Speed Low in Climb (100ft - 1500ft)	For 3 s, CAS < V2 + :	6 kts	2 kts	-2 kts	TRUE
1051	Speed	U-turn Detected	Info event	Info event	Info event	Info event	TRUE
1052	Speed	High Speed Exit Detected	Info event	Info event	Info event	Info event	TRUE
1053	Speed	Rolling Take Off					TRUE
1100	Pitch	Pitch High at Take Off	PITCH >: (At Lift Off);	10 °	11 °	12 °	TRUE
1101	Pitch	Pitch Rate High at Take Off	PITCH_RATE >:	4.5 °/s	5.5 °/s	6.5 °/s	TRUE
1102	Pitch	Pitch Rate Low at Take Off	PITCH_RATE (MAX) <:	2.25 °/s	2 °/s	1.5 °/s	TRUE
1103	Pitch	Pitch High in Climb	PITCH >: TOL = 3s;	19 °	20 °	21 °	TRUE
1104	Pitch	Pitch Low in Climb	PITCH <: TUL = 3s;	12 °	10 °	8 °	TRUE
1108	Pitch	Pitch High at Touchdown	PITCH >: (At Touch Down);	8.2 °	9.2 °	10.2 °	TRUE
1109	Pitch	Pitch Low at Touchdown	PITCH <=: (At Touch Down);	2 °	1 °	0.5 °	TRUE
1111	Pitch	Pitch Rate High at Landing	PITCH_RATE (MAX) >= :	2 °/sec	2.5 °/sec	3 °/sec	TRUE
1200	Roll	Bank High in Approach (below 100ft)	| ROLL | (MAX) >=:	6 °	8 °	10 °	TRUE
1201	Roll	Bank High in Approach (400ft - 100ft)	| ROLL | >: TOL = 3s	10 °	15 °	20 °	TRUE
1202	Roll	Bank High in Approach (1000ft - 400ft)	| ROLL | >: TOL = 3s	25 °	30 °	35 °	TRUE
1203	Roll	Bank High in Approach (above 1000ft)	| ROLL | >: TOL = 3s	32 °	36 °	40 °	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1204	Roll	Bank Cycling in Approach	Oscillation number >:	4	6	8	TRUE
1206	Roll	Bank High in Initial Climb (Take Off - 100ft)	| ROLL | >: TOL = 3s	6 °	8 °	10 °	TRUE
1207	Roll	Bank High in Initial Climb (100ft - 400ft)	| ROLL | >: TOL = 3s	15 °	20 °	25 °	TRUE
1208	Roll	Bank High in Initial Climb (400ft - 1000ft)	| ROLL | >: TOL = 5s	25 °	30 °	35 °	TRUE
1209	Roll	Bank Cycling during Initial Climb	Oscillation number >:	4 °	6 °	8 °	TRUE
1210	Roll	Bank High During Flare (below 10ft)	| ROLL | (MAX) >=:	5 °	7 °	9 °	TRUE
1211	Roll	Bank oscillation in Approach (below 100ft)	ROLL (Range) >=	6 °	10 °	14 °	TRUE
1311	Height	Level Off in Approach below 1400ft (G/S off)	IVV <: TOL = 10s	Info event	Info event	Info event	TRUE
1312	Height	Path High in Approach (at 1200ft)	Path Angle >:	Glide angle + 0.4°	Glide angle + 0.7°	Glide angle + 0.95°	TRUE
1313	Height	Path Low in Approach (at 1200ft)	Path Angle <:	Glide angle - 0.4°	Glide angle - 0.6°	Glide angle - 0.8°	TRUE
1314	Height	Path High in Approach (at 800ft)	Path Angle >:	Glide angle + 0.4°	Glide angle + 0.7°	Glide angle + 0.95°	TRUE
1315	Height	Path Low in Approach (at 800ft)	Path Angle <:	Glide angle - 0.4°	Glide angle - 0.6°	Glide angle - 0.8°	TRUE
1316	Height	Path High in Approach (at 400ft)	Path Angle >:	Glide angle + 0.4°	Glide angle + 0.7°	Glide angle + 0.95°	TRUE
1317	Height	Path Low in Approach (at 400ft)	Path Angle <:	Glide angle - 0.4°	Glide angle - 0.6°	Glide angle - 0.8°	TRUE
1400	Vertical rates	Path High in Descent (above FL100)	Slope <: TOL = 30s	-6 °	-7 °	-9 °	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1401	Vertical rates	Rate Of Descent High in Approach (above 2000ft)	IVV <: TOL = 3s	-2000 ft/min	-2500 ft/min	-3000 ft/min	TRUE
1402	Vertical rates	Rate Of Descent High in Approach (2000ft - 1000ft)	IVV <: TOL = 3s	-1200 ft/min	-1500 ft/min	-1800 ft/min	TRUE
1403	Vertical rates	Rate Of Descent High in Approach (1000ft - 500ft)	IVV <: TOL = 3s	-1100 ft/min	-1300 ft/min	-1500 ft/min	TRUE
1404	Vertical rates	Rate Of Descent High in Approach (below 500ft)	IVV <: TOL = 3s	-1000 ft/min	-1100 ft/min	-1300 ft/min	TRUE
1405	Vertical rates	Path High at Landing (below 20ft)	ALT_AFE <= 20; Slope >:	2.25 °	2.65 °	3 °	TRUE
1406	Vertical rates	Rate Of Descent High in Descent (FL100 - FL30)	IVV <: TOL = 60s	-2500 ft/min	-3000 ft/min	-3500 ft/min	TRUE
1407	Vertical rates	Rate Of Climb Low in Initial Climb (below 1000ft)	IVV <: TOL = 5s	1000 ft/min	750 ft/min	500 ft/min	TRUE
1500	Acceleration	Vertical Acceleration High at Take Off	VRTGMAX >=:	1.35 G	1.4 G	1.45 G	TRUE
1501	Acceleration	Vertical Acceleration High in Flight	VRTGMAX >=: OR VRTGMIN >=:	1.4 G ; 0.6 G	1.6 G ; 0.4 G	1.8 G ; 0.2 G	TRUE
1504	Acceleration	Vertical Acceleration High at Touchdown	VRTGMAX >=:	1.5 G	1.6 G	1.75 G	TRUE
1600	Configuration	Flaps Early Retraction at Take Off	Slats/Flaps settings change at _ALTITUDE <	< 900	< 800	< 700	TRUE
1601	Configuration	Flaps Late Setting at Landing	ALTITUDE<:	1000 ft	750 ft	500 ft	TRUE
1602	Configuration	Flaps Questionable	CONF (Info if =3)	#	#	< 3	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
		Setting at Landing					
1605	Configuration	Configuration change Questionable during Go around	Length of Time… :	Gear down in CONF 3 >= 10s	Gear Up in CONF FULL >= 20s	Gear Down in CONF FULL > 20s	TRUE
1606	Configuration	Speed Brakes Used in Approach (below 1000ft)	:	#	#	Speed Brakes out in Final App.	TRUE
1607	Configuration	Auto Pilot Off Detected in Cruise	Length of Time AP off during Cruise:	180 s	900 s	1800 s	TRUE
1609	Configuration	Landing Gear Late Retraction	ALTITUDE >:	200 ft	300 ft	500 ft	TRUE
1611	Configuration	Reversers Delayed at Landing	Reverse not deployed:	5 sec after touch down	10 sec after touch down	_CAS < 50 kts	TRUE
1613	Configuration	Speed Brakes Out with Significant Thrust	Length of Time (N1 > 60):	20 s	40 s	60 s	TRUE
1618	Configuration	Rudder Large Inputs (above 200ft)	In Symetrical flight RUD_PDL*Coeff >	#	4.2	5.7	TRUE
1619	Configuration	Reversers Abusive Use	Full reverse applied with CAS <	65 kts	55 kts	45 kts	TRUE
1623	Configuration	Autoland	Landing performed with AP ON	#	#	#	TRUE
1624	Configuration	Ground Spoiler lever not armed	GND spoiler lever position	#	#	Not armed prior to take-off or landing	TRUE
1701	Thrust	Thrust Low in Approach (below 500ft RA)	THR_DEFICIT >:	11%	15%	19%	TRUE
1702	Thrust	EGT High	EGT_ENGn > (TOL>=2s)	615 °C	627 °C	635 °C	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1703	Thrust	Thrust Reduction Late at Landing	Thrust Still High and :	RALT<=3 ft	A/C on Ground	A/C on Ground for 2 secs	TRUE
1705	Thrust	Thrust Asymmetry in flight	(N1_DIFF) > 10 RPM: (EPR_DIFF)> 0.05	10	30	60	TRUE
1706	Thrust	Thrust Asymmetry in Reverse	(N1_1 - N1_2) > 10 RPM: (EPR_1 - EPR_2) > 0.05:	5 s	10 s	15 s	TRUE
1708	Thrust	Thrust High during Taxi	Any Engine >: TOL >= 3s	N1 : 42 % ; EPR : 1.1	N1 : 45 % ; EPR : 1.15	N1 : 50 % ; EPR : 1.2	TRUE
1709	Thrust	Thrust Power High at Line-Up	Heading variation higher than 30° and high N1	55 kts	60 kts	65 kts	TRUE
1800	Alignment	HDG Deviation at Take Off (100kts - Rotation)	|HEADING_LINEAR-headref| >: TOL >=3s	2 °	3 °	4 °	TRUE
1801	Alignment	Deviation below Glideslope (Above 1000ft)	GLIDE >: TOL >= 3s	0.5 dot	1 dot	1.5 dot	TRUE
1802	Alignment	Deviation above Glideslope (Above 1000ft)	GLIDE >: TOL >= 3s	-0.5 dot	-1 dot	-1.5 dot	TRUE
1803	Alignment	Localizer Deviation	|LOCC| >: TOL >= 3s	0.5 dot	1 dot	1.5 dot	TRUE
1804	Alignment	Deviation below Glideslope (1000ft - 300ft)	GLIDE >: TOL >= 3s	0.5 dot	1 dot	1.5 dot	TRUE
1805	Alignment	Deviation above Glideslope (1000ft - 300ft)	GLIDE >: TOL >= 3s	-0.5 dot	-1 dot	-1.5 dot	TRUE
1807	Alignment	Heading Deviation at Landing (above 60kts)	4sec after TD GS > 60kts HDGdev >:	3 °	4 °	5 °	TRUE
1808	Alignment	Long Flare Time	Time from 30ft to TD >:	10 sec	12 sec	14 sec	TRUE
1812	Alignment	Height Low at Threshold	Height Low at THR	<= 35	<= 30	<= 25	TRUE
1813	Alignment	Height High at Threshold	High Height at THR	>=60 ft	>=70 ft	>=80 ft	TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1814	Alignment	HDG Significant Change in Approach (below 500ft)	deltaHDG >=:	5 °	15 °	20 °	TRUE
1817	Alignment	Short Flare Distance	DIST_TO_THR (at TD) <=:	450 m	350 m	250 m	TRUE
1818	Alignment	Long Flare Distance	DIST_TO_THR (at TD)	750 m	900 m	1050 m	TRUE
1819	Alignment	Short Flare Time	Time from 30ft to Touch Down <:	5 s	4 s	3 s	TRUE
1820	Alignment	High Vertical speed before Touchdown	Late Flare	< -6.5 ft/s	< -8 ft/s	< -10 ft/s	TRUE
1901	Warning	Flaps/Slats extended above Max altitude	For 10s, FLAPS deployed and ALT_STD >	#	#	20200 ft	TRUE
1902	Warning	Altitude Above Maximum Operating Altitude	ALT_STD >:	#	#	39800 ft	TRUE
1903	Warning	Windshear Warning	_WARNING =:	#	#	WIND_SHEAR	TRUE
1904	Warning	Go Around	Go Around when ALT_AFE:	>200	<=200	#	TRUE
1905	Warning	Engine reverser selected in flight	REVERSER selected in flight for more than 1sec	#	#	at least 3 secs before Touchdown	TRUE
1906	Warning	Bounced Landing	:	Bounced	Bounced and |IVV| > 200 ft/min	Bounced and |IVV| > 400 ft/min	TRUE
1907	Warning	Touch And Go	Touch and go:	More than one	Only one	#	TRUE
1909	Warning	Alpha Floor	_ALPHA_FLOOR :	#	#	TRUE	TRUE
1910	Warning	Alternate Law	ALTERN_LAW:	#	#	TRUE	TRUE
1911	Warning	Direct Law	DIRECT_LAW:	#	#	TRUE	TRUE
1914	Warning	Overweight Landing	Landing weight > =:	#	#	64.5 + 1%	TRUE

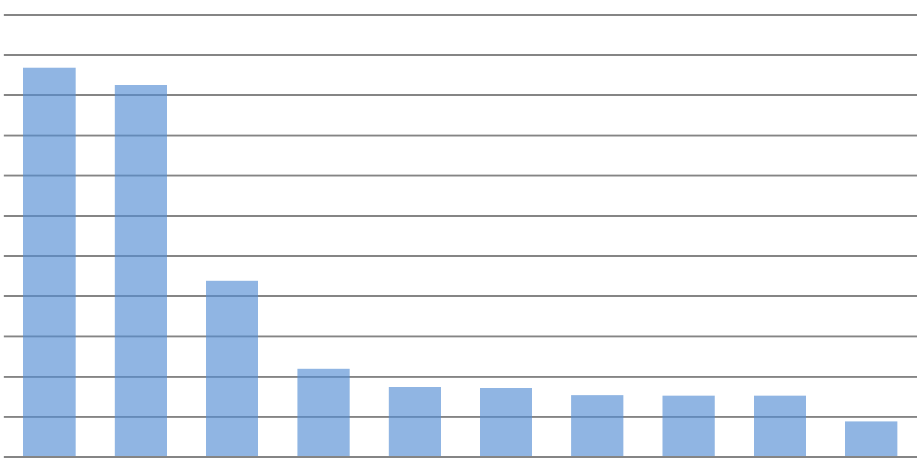
Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
1917	Warning	Stick dual input	(x>=2°) AND (y>=2°)	#	TOL>=0.25 sec	TOL>=3 sec	TRUE
1918	Warning	TCAS RA Warning	TCAS_RA during:	#	#	3 s	TRUE
1919	Warning	Level Bust	fabs (ALT_STD - ALT_SEL) >, tol=3	150 ft	250 ft	350 ft	TRUE
1920	Warning	GPWS Warning (above 1000ft)	GPWS_WARNING or GPWS_GS	#	#	ON	TRUE
1921	Warning	GPWS Warning (1000ft - 500ft)	GPWS_WARNING or GPWS_GS	#	#	ON	TRUE
1922	Warning	GPWS Warning (below 500ft)	GPWS_WARNING or GPWS_GS	#	#	ON	TRUE
1923	Warning	Autoland Warning	WARNING=:	#	#	Autoland	TRUE
1924	Warning	Landing Gear Not Locked Down	LDG not locked down below:	#	#	1000ft	TRUE
1932	Warning	Engine Shutdown in Flight	During 20s N2 < 12 and EGT <:	#	#	<= 300 °	TRUE
1933	Warning	Smoke Warning	WARNING=:	#	#	Smoke	TRUE
1934	Warning	Take Off Config Warning	WARNING=:	#	#	Take Off	TRUE
1936	Warning	Long Holding	number of Holding paterns >=:	2	4	6	TRUE
1940	Warning	Destination Change in Flight	Same airport dep arr with no touch and go:	#	#	#	TRUE
2000	Approach Steady Deviations	Continuously Low during final	1313, 1315, 1317				TRUE
2001	Approach Steady Deviations	Continuously Slow during final	1011, 1013, 1015				TRUE
2002	Approach Steady Deviations	Continuously High during final	1312, 1314, 1316				TRUE
2003	Approach Steady Deviations	Continuously Fast during final	1010, 1012, 1014				TRUE

Event No	Category	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit	Enabled
2004	Approach Steady Deviations	Continuously Steep during final	1402, 1403, 1404				TRUE
2009	Approach Risk Combinations	Late Offset in Short Final	1201, 1814				TRUE
2012	Approach Risk Combinations	Roll Oscillations prior to Flare	1200, 1211				TRUE
2020	Take off Risk Combinations	Over Rotation at Take Off	1101, 1103				TRUE
2021	Take off Risk Combinations	Under Rotation at Take Off	1102, 1104				TRUE
2022	Approach Steady Deviations	Bank continuously excessive close to ground	1200, 1201, 1202				TRUE
2200	Major Risk Detection on Approach	Low Energy Situation in Approach	1701, 2000, 2001	#	#	#	TRUE
2201	Major Risk Detection on Approach	High Energy Situation in Approach	2002, 2003, 2004				TRUE
2205	Major Risk Detection on Approach	Tail Strike Hazard at Landing	1108, 1111				TRUE
2206	Major Risk Detection on Approach	Wing Strike Hazard at Landing	1210, 2012				TRUE
2207	Major Risk Detection on Approach	Hard Landing Hazard	1405, 1820				TRUE
2214	Major Risk Detections at Take off	Tail Strike Hazard at Take Off	1100, 1101				TRUE

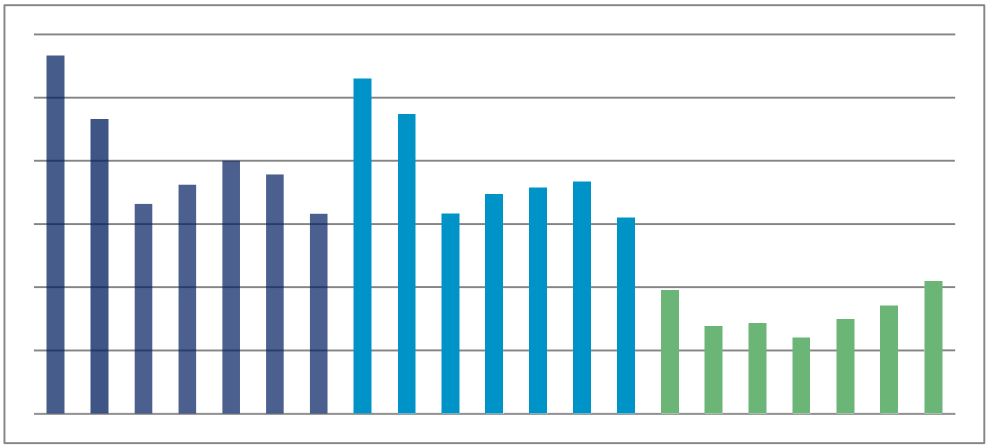
15. AIRFASE Statistics

This part details the computations that Safety Department Filtrations events depend on:

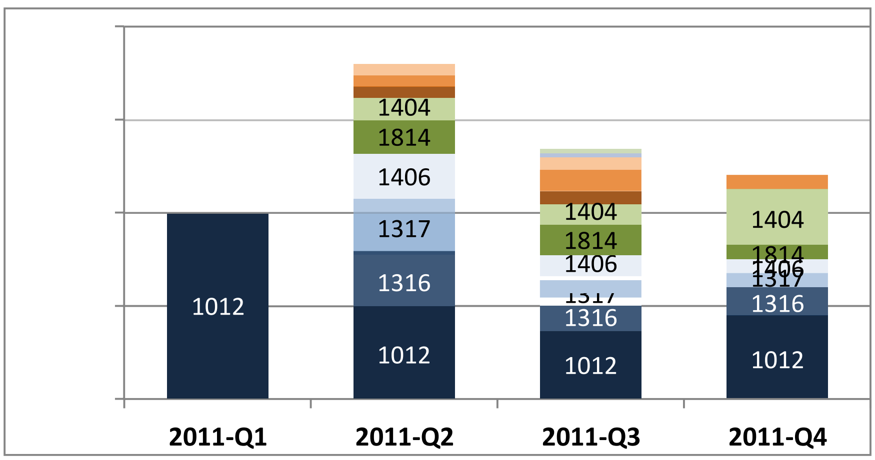
- Top 10 Events Arise from FDA Programs Statistics
- Un-stabilized App. Statistics (Combination of some Events)
- Major events that appears from FDA program without pilots reporting
- Significant deviations from GSOP that results of an undesired aircraft state
- An event and / or combination of events that affect flight safety during any phase of flight.
- Exceedance of any SOP of the concerned type.
- Repetitive intentional violation for any pilot.



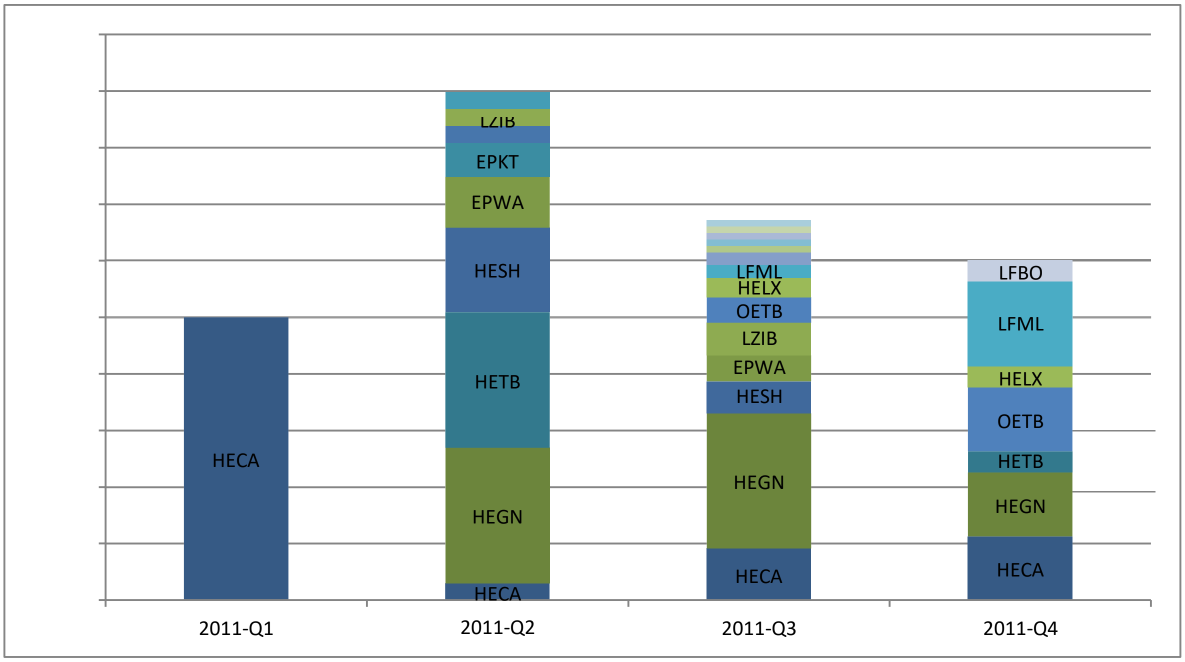
An example of top ten events Report



An event by percentage of total analyzed flights



Un-stabilized Approach by event type (reason)



Unsterilized

Nesma Airlines نسما للطيران	**Air Safety Report**	**Safety & Quality Department**
Name:	**POS.**	**ID #:**
Date of Event (DD/MM/YY)	**Time of Event UTC** **DAWN/DAY/DUSK/NIGHT/---------**	**Flight Number**
Flight Route **From: To:** **DIVERT CITY (if applicable):**	**Location of Event (If applicable)**	**Gate # (If applicable)**
	Aircraft Registration:	**Aircraft Type:**
Flight phase (circle one or all that apply) **Parked – Push-Back-Taxi-out-Takeoff-Initial Climb-Climb** **Cruise-Holding-Descent-approach-Go Around-Missed Approach-Landing-Taxi-in-Parking**		
Runway # (if applicable)	**Runway Condition (if applicable)**	**In-flight/Airfield Wx./ATIS** IMC/VMC/OTHERS
RTO speed	**Aircraft Altitude/FL**	**RVSM** YES/NO

Event Title			
☐ Aircraft Damage	☐ Exceedence (Sys/limit)	☐ SOPs	☐ TCAS/Near Air Miss
☐ ATC communication	☐ Excursion TWY/RWY	☐ Overweight Handling	☐ Use of Reserve Fuel
☐ Bird/Lighting Strike	☐ Incursion TWY/RWY	☐ Pax Illness / DR. Kit	☐ Weight and Balance
☐ Communication Deficiency	☐ Fire or smoke warning	☐ Ramp Safety	☐ Wind Shear
☐ Dangerous Goods	☐ FOD damage/concern	☐ Rejected Take-off (RTO)	☐ (Pred.) Wind Shear
☐ Deviation (ATC-ALT)	☐ Go-Around	☐ Return from flight	☐ Braking Malfunction
☐ Diversion	☐ GPWS/EGPWS (TERR)	☐ Safety Equipment	☐ Other Safety Concerns
☐ Disruptive Passenger	☐ Ground Support Deficiency	☐ Security Breach	
☐ Emergency	☐ Taxi concern	☐ Severe Turbulence	
☐ Engine Shutdown/Failure	☐ Handling Difficulties	☐ Tail Strike	
	☐ Navigational Concern		

Factual description of event with any relative factors (weather, ATC, airfield facilities, etc) (Additional space provided on reverse side)

Reported event root cause (from your point of view, what is the primary reason of such event?)

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6.4 LOSA Observer Manual

6.4.1 LOSA: An assessment of Normal Flight Operations

6.4.1.1 The Framework of a LOSA

- Primarily pilots conduct LOSA's. the size of the team depends on the size of the organization, the number of flights to be observed, and the length of time that observations are to take place.
- Observational training in evaluating CRM and the use of the LOSA rating forms must be provided before data collection begins. One Human Factors (HF) specialist (accredited CRMI (E), TRI (E) or an Aviation Psychologist) usually conducts the training. This will ensure that the observations shall be conducted in the most standardized manner possible.
- On each flight segment, systematic observational data are collected from the observers' jump seat. The set of forms used to collect the observational data are generically called the Line Operations Safety Audit Checklist (LOSA Form). The LOSA form records three different types of data:

  1) CRM skills.

  2) External threats

  3) Crew errors
- After the training, the observer spends a designated period of time observing regularly scheduled line flights. The objective is to sample the largest number of crews and segments possible in the period, given the flight schedule, logistics, and type of operation sampled.
- Members of the observation team are typically required to observe flights on different aircraft types. This is an important element of the line audit process for several reasons. For one, this has the advantage of allowing line pilots of particular fleets to break out of the "box" and compare operations of fleets other than their own. Eventually, this helps the team as a whole to focus on human factors issues and common technical problems. Secondly, the results are more robust if observers observe across many fleets instead of being housed in only one.

- Normally the line audit is announced to crew members by a letter from the head of flight operations with the endorsement other relevant personnel such as union representatives and the chief pilot. This letter specifies the purpose of the study, the fact that all observations are of **a non-jeopardy nature**, and that all data **will be kept in a confidential manner**. The letter of announcement usually precedes the line audit by several weeks, and line observers are given copies of the letter to show crewmembers in case questions should arise.
- Data is kept strictly anonymous and crews are given assurance that they are not in disciplinary jeopardy.
- LOSA to be applied every four years and the report effectivity may be extended as per safety committee recommendations.

6.4.2 LOSA Checklist Instructions to the User

- The rest of this manual will cover issues surrounding the use of the LOSA Checklist. The purpose is to provide some general areas of guidance that are needed to use the forms properly. The discussion of these issues will be divided into three sections based upon the design of the LOSA Checklist: Human Factors Skills, External Threats Log, and the Cockpit Crew Error Management Checklist. You will need to have your copy handy because the discussion will point out particular areas of the LOSA Checklist that need to be examined.

6.4.2.1 Section I

- Most of this form is self-explanatory. Where possible, specific instructions have been included on the checklist itself. The following are some issues brought up in past training sessions that seem to be the most troublesome for observers.
- One Form Per Flight Sector:
- The goal is to obtain ONE completed LOSA for EACH flight sector. If you observe a crew for multiple sectors, more than one LOSA would be filled out. We need to know which was the first observation, second, etc. To record this, look in the top part of page 1 of the form for a section labelled "Crew Observation Number" If you observe the same crew for

- Phases of Flight:
- The four phases of flight used on the Human Factors Skills Assessment are:
  1) Pre-Departure,
  2) Takeoff/Climb,
  3) Cruise,
  4) Descent/ Approach/ Landing.
- Pre-Departure includes the time from when the crew first meets through the taxi out. Take off & Climb commences with the take-off roll and ends with the initial level off. Cruise continues until top of descent. Descent/Approach & Landing includes descent through taxi, shutdown and post flight activities.

The Rating Scale:

After the demographics of the flight segment have been recorded and its operational complexity is documented, the flight narrative is written, this is where you record key points either good or bad. This narrative will help you to use the rating scale for a series of observational judgements that use a common rating scale, shown below.

1	2	3	4
Poor – Observed performance had safety implications. This includes instances where necessary behaviour was not present, and examples of inappropriate behaviour that was detrimental.	Marginal- Observed performance meets minimum requirements. This level of performance is less than desired for effective crew operations.	Good- Standard level of behaviour promotes and maintains crew effectiveness. This is the level of performance that should be normally occurring in flight operations	Outstanding - Performance Represents exceptional skill in the application of specific behaviours, and serves as a model for teamwork – truly noteworthy and effective.

- In most cases, this lowest rating of "poor" is reserved for circumstances where there is an **implication to flight safety** for the marker being rated. This and the other three categories, "Marginal", "Good" (i.e. standard), and "Outstanding" are defined on the form.
- Absence of a Necessary Behaviour:
- If a behaviour was not seen but should have been present or the crew did not perform as well as they could have, this needs to be indicated. For example, if you saw a situation occur where the FO noticed the captain making a navigational error, but did not speak up

about it, a "**Poor**" would be specified for the marker "Assertiveness", along with comments explaining the reason for this low rating.

Contribution to Crew Effectiveness and Overall Crew Ratings:

- In some circumstances, particular crewmembers may stand out from others. For example, a captain might be particularly insensitive to others or a first officer might show extremely effective use of advocacy in getting a decision alternative across to others. In such situations, indicate the specific crewmember who was influential and the behaviours used. Please complete these ratings whenever an individual's performance is particularly noteworthy, either in a positive or negative manner

Confidentiality:

- Crews: The goal of research using the LOSA as an audit is to collect meaningful data on overall crew coordination and performance without identifying any specific crew or crewmember. No names or dates are to be entered. The form does ask for the aircraft type and some other general demographics for analyses to determine if there are any trends in performance associated with these particular items.
- Observer: A confidential Observer ID code will be given to you, use it throughout all of your observations. This ensures the confidentiality of the observer.

Completion of Forms and Communication with the Crew:

The timing for when the form is completed is at the discretion of the observer, although it must be done while details of the flight are fresh in your mind, with reference to the notes taken in flight and carried out in confidence i.e. no one watching you fill in the forms!

It is certainly reasonable for crewmembers to inquire about what is being collected and as such it is appropriate to show crews the blank form, if, stressing the fact that all ratings ***are anonymous***, and that the data are collected for the purpose of assessing overall line performance, not that of particular crews or individuals. You must **<u>not</u>** show the crew the actual ratings you assigned since this might generate unneeded controversy. It would be unacceptable to fill out the LOSA in the cockpit with the crew present. It is generally best to fill out the LOSA as soon as possible after the observation.

It is appropriate to explain to the crew that you may be taking notes on occasion. These notes can serve to jog your memory as to key events in the flight, crewmember demographics, and to document error management details.

Flight Demographic Section:

- City Pairs: Use the code section to identify the city pairs and anonymised data.
- Operational complexity and external threats:
- e.g. WX, ATC, Traffic, MEL's, etc. After such comments have been made, the observer is to make a summary judgment of the operational complexity using the scale provided. Each complicating factor shall be documented on the External Threats Log, along with other aspects of each event.

Unseen or Unobserved Behaviours:

- The LOSA form contains a wide range of behavioural markers. On most flights, many behavioural markers will be seen and can be rated in all phases of flight (for vigilance or captain leadership. However, it would be unlikely that all would be observed on all phases of a flight segment. IF you do not observe a specific, behaviour enter N.O. for "Not Observed" also if you cannot make a fair judgment of the item in that phase of flight. For example, if you were not able to observe the initial crew briefing because you boarded the aircraft late. DO NOT GUESS!

Technical Proficiency Markers:

- The LOSA is not designed to address issues of flying skills or related technical behaviours. However, three items directly address technical issues that have been shown to be diagnostic of crew behaviour and are related to past incidents and accidents. These issues concern sterile cockpit SOP compliance, altitude SOP compliance and/or terrain awareness, and checklist compliance and usage. The judgements in this section are for summary purposes. A crew rated "1" or "Poor" for this summary judgement, would receive it based on poor technical proficiency that **threatens the safety of the flight**.

- Such ratings might be made based on altitude busts, navigational mistakes, missed or incorrect checklists, leaving a cockpit door open in flight etc. Specific errors on these, as

- well as other SOP items must always be documented in the Cockpit Crew Error Management Worksheet.

Overall Observations Ratings:

- The first items of the LOSA Checklist asks for ratings of specific behavioural markers. “Overall Crew Rating” requires you to take all of these ratings and observations into consideration and make a single judgment about the overall technical and crew performance.

6.4.2.2 Section II - Instructions for the Threats Management Worksheet

- The Threat Management Worksheet is designed to collect information the kinds of safety-threatening events that present themselves to the cockpit crew and their management of these events.

External Threats Defined:

- External Threat: an external situation that must be managed by the cockpit crew during normal, everyday flight. Such events increase the operational complexity of the flight and undoubtedly threaten the flight at some level. Events may be expected by the crew, and briefed in advance. They may also be unexpected, occurring suddenly and without any warning or briefing possibility. External threats may be relatively minor or major. We want you to record all external threats that are on the code sheet or any others that you think are significant. If the crew has to focus attention and/or problem solving skills over and above those required to complete a normal flight in order to resolve an issue, a line on the Threat worksheet should be filled out.
- Errors caused by non-cockpit personnel are considered external threats. For example, if the cockpit crew detects a fuel loading error made by ground staff, it would be entered as an external threat, not as an error. The crew was not the source of the error (although they must manage it -- as they would any other external threat). Other examples of non-cockpit crew errors that would be entered as external threats would be ATC clearance errors caught by the crew, dispatch paperwork errors, discrepancies in boarding counts by F/A’s, etc.

Using the Threat Management Worksheet:

- For each event, a line in the log sheet is completed. If the event is not described in the flight narrative or external threats comments, you will need to describe it in detail on the log. If it has been described previously, a short comment should be made to identify which specific event you are coding. Commenting should be done before any coding is attempted.
- The codes used to fill out each column on the Log are listed in the Appendix. The first task is to code the type of external threat. On the code sheets, you will find a list of external threat categories. Choose the one that best fits the event you have observed, and write the code number of that threat in the blank. Codes for the phase of flight where the event started and ended are available in the code sheets.

Commenting:

- The best of coding schemes cannot fully capture all possible threats to the safety of flight and all of the possible errors cockpit crewmembers can make. Try to fit the situations into the categories where possible, but remember that your comments add meaning to the codes you choose.

6.4.2.3 Section III - Instructions for the Error Management Worksheet

- The last form in the LOSA, called the Error Management Worksheet, collects data on crew error and the crew's management of error.

Cockpit Crew Errors Defined:

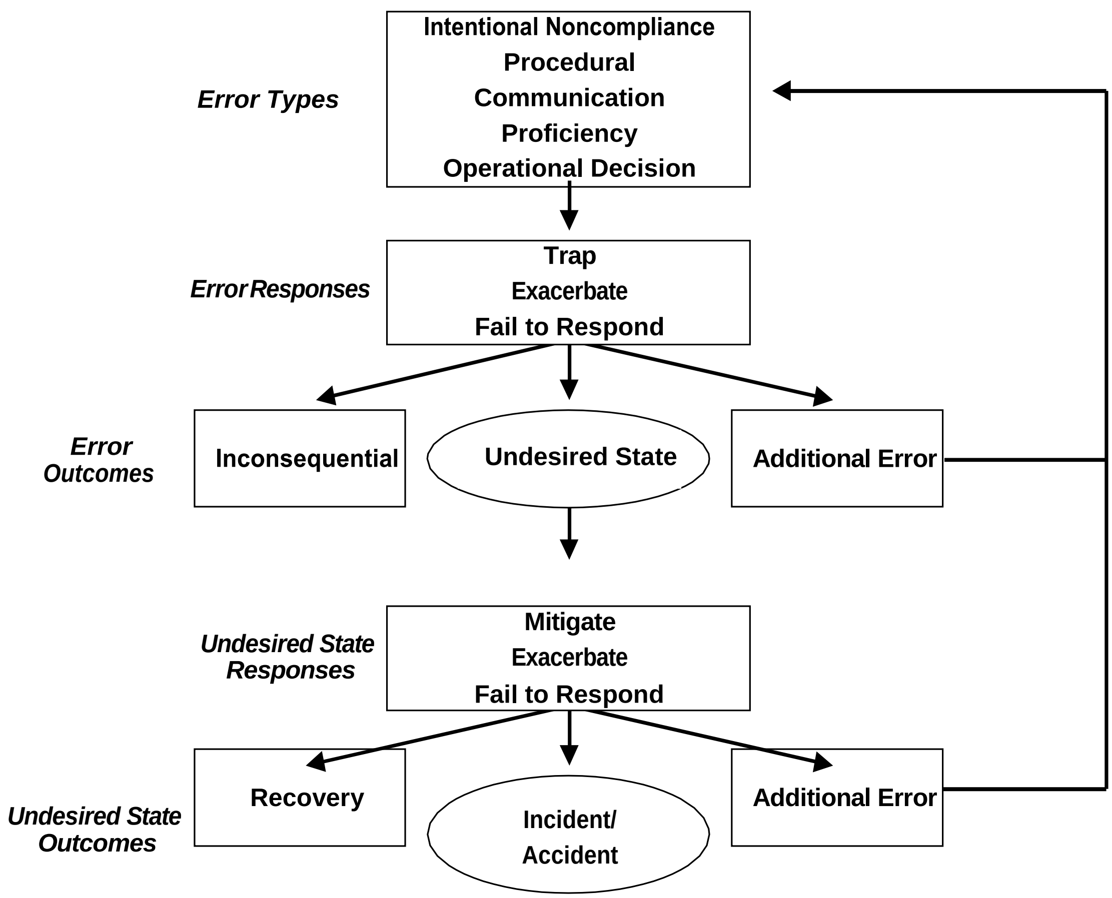
- Cockpit crew error is defined as:
- "a crew action or inaction that leads to a deviation from crew or organizational intentions or situational requirements."
- Errors in the operational context tend to reduce the margin of safety and increase the probability of accidents or incidents. To paraphrase this wordy definition, we are looking at cockpit crew slips, lapses, and mistakes. These may be defined in terms of non-compliance with Authority Regulations, SOP, or policy, or unexpected deviation from crew, company, or ATC expectations. Errors to be entered on the worksheet may be minor (entering the wrong altitude into the MCP/FCU, but catching it quickly) or major

(forgetting to do an essential checklist). **<u>We want you to record all cockpit crew errors that you detect.</u>**

- SOP's and checklists have been designed by manufacture's and airlines as the proper and safe way to operate an aircraft. If a check airman observes a crew deviating from SOP's or checklist protocol, he would define this as an error, and **<u>so must YOU</u>**! If a crew member does not know how to execute a procedure properly, or cannot control the aircraft in the expected manner, errors have been made. Deviation from expectations of ATC also are classified as crew errors – these would include altitude deviations, or deviation around thunderstorms without ATC notification.
- There are many decision points on a normal flight which are not defined by SOP; but any time the crew makes a decision that unnecessarily increases risk to the safety of flight, it is defined as a crew error.
- Crew errors may not have any consequences, but they still need to be entered on the worksheet. For example, a sterile cockpit violation may not have any negative consequence to the flight, but it is a violation of Regulation, and thus must be entered as an error. In additional, errors may be intentional or unintentional. As implied in the definition, the lack of action may also be defined as an error when a crew action is appropriate or proscribed in SOP.

A Model of Cockpit Crew Error Management

In order to understand how to code cockpit crew errors on the worksheet, it is necessary to understand the LOSA conceptual model. The model was derived from previous flight audits, and seems to fit most errors, their management and outcomes (Helmreich, 1999).



Definitions of the five error types:

- These definitions are used in filling out the column on the worksheet labelled "Error Type". The decision tree on the next page will help you determine the appropriate code for an error type.

Intentional Noncompliance Error:

- An error that is an intentional violation of SOP's or regulations. When coding this type of error, take into account the context. If the crew is under a heavy workload or commits the error only one time across all phases of flight, this would more than likely be considered a procedural error. If you see the crew making the same error over and over again or it was an error due to complacency, code it as an intentional noncompliance error.

Procedural Error:

- An unintentional error that includes slips, lapses, or mistakes in the execution of regulations or procedures. The intention is correct but the execution is flawed. These also include errors where a crew forgot to do something. To be coded into this category, there must be written procedures and crew intention to comply.
- Communication Error:
- An unintentional error that occurs when information is incorrectly transmitted or interpreted within the cockpit crew or between the cockpit crew and an external source such as ATC. An error that involved a failure on part of the crew to communicate important operational information is also considered a communication error.

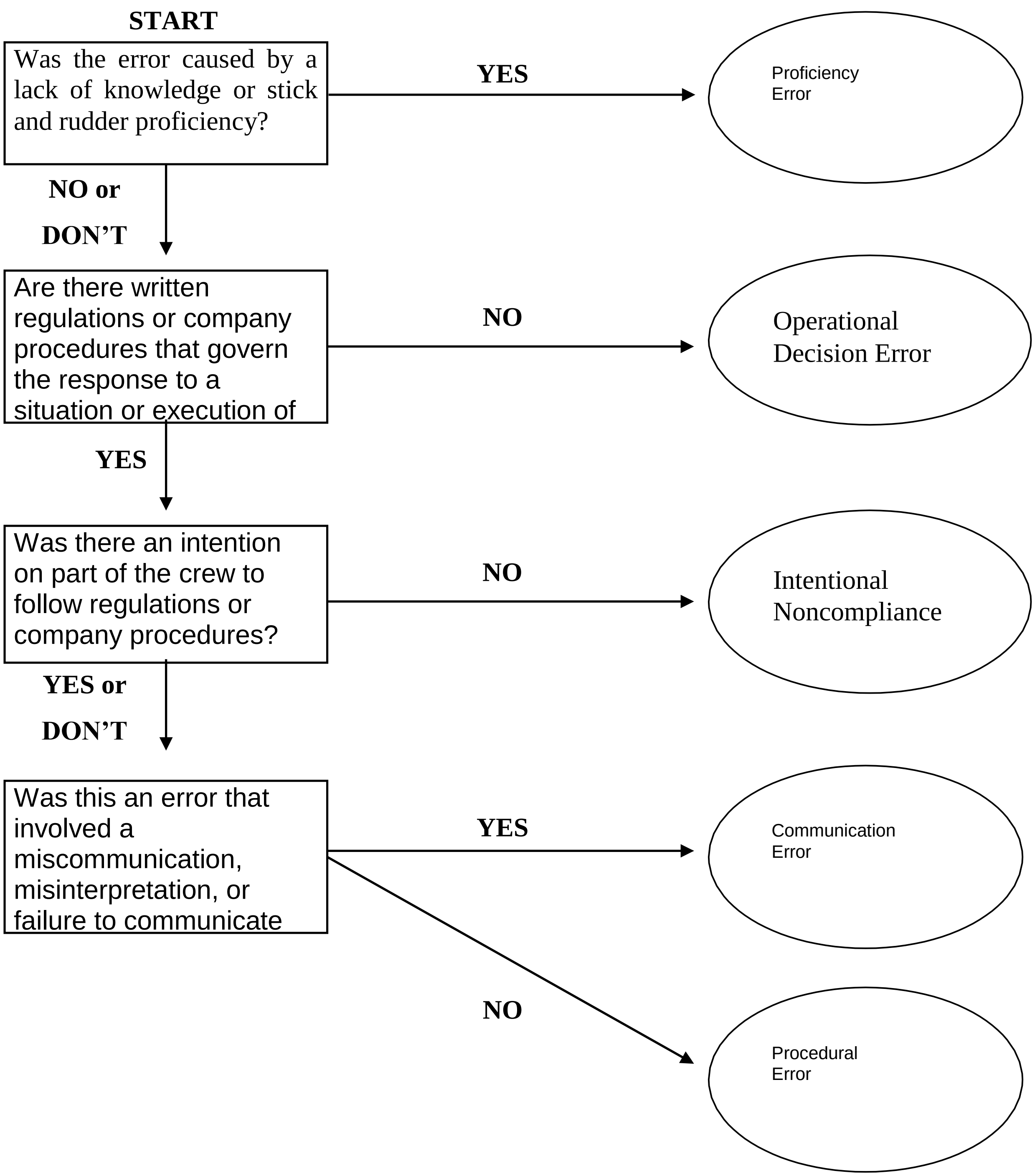
Proficiency Error:

- An unintentional error that indicates a lack of knowledge or stick and rudder skill.

Operational Decision Error:

- An unintentional error that occurs when the cockpit crew makes a discretionary decision, not covered by regulations or procedures, that unnecessarily increases risk. An example would include the crew's decision fly through known wind shear on an approach.

Decision tree for determining error types



Definitions of crew responses to error

- These definitions are used in filling out the column on the worksheet labeled "Crew Response to the Error"
    1. <u>Trap</u> – a cockpit crew response in which an error *is detected* and managed before it becomes consequential
    2. <u>Exacerbate</u> – a cockpit crew response in which the error is detected but the crew's action or inaction leads to a negative outcome
    3. <u>Fail to respond</u> – the lack of a cockpit crew response to an error because it was either ignored or undetected

Definitions of error outcomes

- These definitions are used in filling out the column on the worksheet labeled "Crew Response to the Error"
    1. <u>Inconsequential</u> – an outcome in which the error had no effect on the safe completion of the flight, or was made irrelevant by successful cockpit crew error management
    2. <u>Undesired State</u> – a state in which the aircraft is unnecessarily placed in a condition that increases risk to safety
    3. <u>Additional Error</u> - results in or is closely linked to an additional error

Definitions of crew response to undesired aircraft states

- These definitions are used in filling out the column on the worksheet labeled "Crew Response to the Und State".
    1. <u>Mitigate</u> – a crew response to an undesired state that results in the alleviation of the unnecessary risk by returning the aircraft to a desired state
    2. <u>Exacerbate</u> – a cockpit crew response to a detected undesired aircraft state in which the crew's action or inaction leads to a negative outcome
    3. <u>Fail to respond</u> – the lack of a cockpit crew response to the undesired aircraft state either because it was ignored or undetected.

Definitions of outcomes of undesired aircraft states

- These definitions are used in filling out the column on the worksheet labeled "UAS Outcome"
  1. Recovery – the undesired aircraft state is successfully returned to its desired state
  2. Incident -the undesired aircraft state results in an undesired outcome.
     These may include long landing or landing too far to the left or right of the centerline) or may result in a reportable incident.
  3. Additional error – the crew's actions or inaction that results in or is closely linked to another cockpit crew error.

Using the Cockpit Crew Error Management Worksheet:

- One line on the form is filled out for each crew error observed. Each error has an assigned error number. First, write a comment that describes the error, its management, and its outcome. If it has been fully described in the flight narrative, a short, identifying description is adequate. If the error was associated with an external threat, the ID number of that external threat is entered as specified on the form. All other codes are entered from the code book appendix.
- Once you have determined which of the five general error type,'s best fits the error from the definitions listed above or reference to the decision tree, enter the specific 3-digit error code.
- An example for coding these two columns: you observed a checklist being performed from memory, the Error Type =1 for an "Intentional Noncompliance Error" and the Error Code = 120 "Performing a checklist from memory. On the form, you also indicate the crew response to the error, the error outcome, who caused and detected the error.
- The outcome of the error is dependent upon the crew's response:
  1. If a crew **Traps** an error, then the only outcome is Inconsequential.
  2. If you coded the response as **Exacerbate**, then the outcomes can only be an Additional Error or Undesired State.
  3. A **Fail to respond** can lead to all three outcomes: Inconsequential, Undesired State, and an Additional Error.

Multiple and repetitive errors

- An observer may see a crew repeatedly violating sterile cockpit SOP; rather than entering one error line for each specific instance, please, for multiple and repetitive errors enter **one error line for each phase of flight** in where the errors are observed. For four sterile cockpit SOP errors during the preflight phase of flight, enter one error for that phase – not four. Specify in the comments that multiple violations occurred. This convention is also used for repeated SOP violations such as multiple altitude SOP errors of the same type within a phase of flight, or multiple checklist errors of the same type during a phase of flight.

Undesired Aircraft States

- An Undesired Aircraft State occurs when the aircraft is placed in a situation of unnecessary risk by the crew.
- For instance, an altitude deviation is an undesired state that presents unnecessary risk. Undesired aircraft states occur in response to a crew action or inaction (error).
- It is important to distinguish between the errors itself and the undesired aircraft state that can result.

If you observe an undesired aircraft state, there should always be a crew error that is responsible for this undesired state.

- Such errors may be miscommunications, lack of proficiency, poor decision-making, simple mistakes or willful violation of regulations. There are columns on the worksheet that focus on the error itself and others that focus on the undesired aircraft state. For both errors and undesired aircraft states, there is a code specifying its *type*, *who detected it*, a *response* to it, and an *outcome*. Codes for all columns are located in the Code Book Appendix.
- Undesired aircraft states can occur as a result of equipment malfunction or external party errors (e.g., malfunctioning altimeter or FMS, or ATC command error**). These are not associated with crew error and would be classified as external threats**

6.4.3 Appendix A – Three-Digit Detailed Codes for Classifying Intentional Noncompliance Errors

You will notice that some errors are listed under different headings. For example, checklist not performed to completion, may appear under the Intentional Noncompliance Errors section and also in the Procedural Errors section. This is because the observer can classify the checklist error as either an intentional non-compliance error or as a procedural error, depending on the context. Errors must be classified according to the five error types before they are classified by the 3-digit detailed codes. Once so classified, look up its 3-digit code in the section that corresponds with its classification.

Sterile Cockpit Errors

100 Sterile cockpit violation

Callout Errors

104 Omitted takeoff callouts (i.e., V-speeds)

105 Omitted climb or descent callouts

106 Omitted approach callouts

Crew to ATC Errors

109 Altitude deviation without ATC clearance

110 Course or heading deviation without ATC clearance (deviation more than 20 degrees)

111 Use of nonstandard ATC phraseology

112 Omitted position report to ATC

113 Omitted non-radar environment report to ATC

114 Omitted call signs to ATC

Checklist Errors

120 Checklist performed from memory

121 Completed checklist not called “complete”

122 Checklist not performed to completion

123 Use of nonstandard checklist protocol (i.e., use of nonstandard responses)

124 Omitted checklist

125 Self-initiated checklist – no challenge or response

126 Omitted abnormal checklist

Cross-Verification Errors

140 Failure to cross-verify MCP / altitude alerter changes

141 Failure to cross-verify FMC/CDU changes before execution

142 Failure to cross-verify altimeter settings

Hard Warning Errors

160 Failure to respond to GPWS warnings

161 Failure to respond to TCAS warnings

Briefing Errors

170 Omitted takeoff briefing

171 Omitted approach briefing

172 Omitted flight attendant briefing (only for the first flight of a trip or crew change)

173 Omitted engine-out briefing

Approach Errors

180 Failure to execute a go-around after passing procedural bottom lines of an unstable approach

Automation and Instrument Setting Errors

185 PF makes own MCP changes

186 PF makes own FMC changes

187 Failure to set altitude alerter

189 Setting altimeters before the transition altitude

190 Using equipment placarded inoperative

Other Noncompliance Errors

199 Other noncompliance errors not listed in the code book.

6.4.4 Appendix B - Three-Digit Detailed Codes for Classifying Procedural Errors

Checklist Errors	240 Wrong setting on the MCP autopilot or flight director switch
200 Missed checklist item	241 Wrong MCP mode executed
201 Wrong checklist performed	242 Wrong MCP mode left engaged
202 Checklist performed late or at the wrong time	243 Manual aircraft control while a MCP mode is engaged
206 Wrong response to a challenge on a checklist (i.e., item not checked that was responded to as "checked")	244 Failure to execute a MCP mode when needed
207 Completed checklist not called "complete"	245 Wrong MCP navigation select setting (NAV/GPS/ILS/VOR switch)
208 Checklist not performed to completion	246 PF makes own MCP changes
209 Omitted checklist	**247** Wrong MCP setting on the auto-throttle switch
233 Omitted abnormal checklist	**Flight Management Computer / Control Display Unit Errors**
Primary Instrument or Panel Errors	249 Failure to cross-verify FMC/CDU changes before execution
210 Wrong altimeter settings	250 Wrong waypoint or route settings entered into the FMC
211 Wrong bug settings (i.e., airspeed or altimeter)	251 Failure to execute a FMC mode when needed
212 Failure to set altitude alerter	252 Wrong mode executed in the FMC
213 Failure to cross-verify altimeter settings	253 Wrong mode left engaged in the FMC
214 Failure to cross-verify altitude alerter	254 Wrong present position entered into the FMC
Lever and Switch Errors	255 Wrong weights and balance calculations entered into the FMC
215 Failure to extend the flaps on schedule	256 Wrong speed setting entered into the FMC
216 Failure to retract the flaps on schedule	257 PF makes own FMC changes
219 Failure to lower the landing gear on schedule	**Radio Errors**
220 Failure to bring up the landing gear on schedule	260 Wrong ATIS frequency dialed
221 Failure to extend the speed brakes on landing	
222 Failure to retract the speed brakes	
223 Failure to engage thrust reversers on landing	
224 Failure to retract thrust reversers after landing	
225 Failure to turn on the landing lights	
226 Wrong fuel switch setting	

228 Failure to turn on the fasten seat belt sign 230 Failure to turn on the A/C packs (no pressurization) 231 Wrong panel setup for an engine start 232 Other incorrect switch or lever settings **Mode Control Panel Errors** 234 Failure to cross-verify MCP / altitude alerter changes 235 Wrong MCP altitude setting dialed 236 Wrong MCP vertical speed setting dialed 237 Wrong MCP speed setting dialed 238 Wrong MCP course setting dialed 239 Wrong MCP heading setting dialed	261 Wrong ATC frequency dialed **Documentation Errors** 263 Wrong ATIS information recorded 264 Wrong runway information recorded 265 Wrong V-speeds recorded 266 Wrong weights and balance information recorded 267 Wrong fuel information recorded 268 Missed items on the documentation (flight plan, NOTAMS, or dispatch release) 269 Misinterpreted items on the documentation (flight plan, NOTAMS, or dispatch release) 270 Wrong time calculated in the flight plan

Callout Errors

275 Omitted takeoff callouts (i.e., V-speeds)

276 Omitted climb or descent callouts

277 Omitted approach callouts

Job Sequence Errors

280 Executing the correct job procedures out of sequence

Air and Ground Navigation Errors

281 Deviating from the localizer

283 Attempting or actually turning down the wrong runway

284 Attempting or actually turning down the wrong ramp / taxiway / gate

287 Attempting or actually lining up for the incorrect runway

288 Attempting or actually lining up for the incorrect airport

289 Failure to execute a go-around after passing procedural bottom lines of an unstable approach

290 Missed runway

291 Missed taxiway

292 Missed gate

Hard Warning Errors

293 Failure to respond to GPWS warnings

294 Failure to respond to TCAS warnings

Briefing Errors

272 Incomplete flight attendant briefing

273 Incomplete cruise briefing

274 Incomplete approach briefing

295 Omitted takeoff briefing

296 Omitted approach briefing

297 Omitted flight attendant briefing

298 Omitted engine-out briefing

Other Procedural Errors

299 Other procedural errors not listed in the code book

6.4.5 Appendix C – Three-Digit Detailed Codes for Classifying Communication Errors

Crew to ATC Errors

300 Wrong read backs or callbacks to ATC

301 Missed ATC calls

302 Omitted call signs to ATC

303 Failure to give read backs or callbacks to ATC

305 Omitted position report to ATC

306 Omitted non-radar environment report to ATC

307 Misinterpretation of ATC instructions

Crew-to-Crew Errors

319 Wrong airport communicated

320 Wrong taxiway communicated

321 Wrong runway communicated

322 Wrong takeoff callouts communicated

323 Wrong climb and descent callouts communicated

324 Wrong approach callouts communicated

325 Wrong gate assignment communicated

335 Crew miscommunication that lead to a misinterpretation

Other Communication Errors

399 Other communication errors not listed in the code book

6.4.6 Appendix D - Three-Digit Detailed Codes for Classifying Proficiency Errors

400 Lack of systems knowledge

401 Lack of automation knowledge

402 Lack of stick and rudder proficiency

403 Lack of knowledge to properly contact ATC

404 Lack of procedural knowledge

405 Lack of weather knowledge

406 Lack of knowledge with standard ATC phraseology

407 Lack of knowledge to contact company (i.e., gate assignments)

499 Other knowledge or proficiency based errors not listed in the code book.

6.4.7 Appendix E- Three-Digit Detailed Codes for Classifying Operational Decision Errors

Descent and Approach Errors

500 Failure to execute a go-around during an unstable approach before reaching procedural bottom-lines

501 Unnecessary low maneuver on approach

502 Approach deviation (lateral or vertical) by choice

503 Decision to start the descent late

Navigation Errors

510 Navigation through known bad weather that unnecessarily increased risk (i.e., thunderstorms or wind shear)

512 Decision to navigate to the wrong assigned altitude

513 Decision to navigate on the incorrect heading or course

ATC Errors

530 Accepting instructions from ATC that unnecessarily increased risk

531 Approved request to ATC that unnecessarily increased risk

532 Failure to verify ATC instructions

533 Altitude deviation without ATC notification

534 Course or heading deviation without ATC clearance

Crew Interaction Errors

540 Non-essential conversation at inappropriate times

Automation Errors

550 FMC over-reliance – used at inappropriate times

551 FMC under-reliance – not used when needed

552 Heads down FMC operation

Instrument Errors

560 Lack of weather radar use

Checklist Errors

570 Failure to complete a checklist in a timely manner (i.e., after takeoff checklist)

Paperwork Errors

590 Failure to cross-verify documentation or paperwork

Other Operational Decision Errors

6.4.8 Appendix F-Threat Management Worksheet Codes

Threat Codes			
Arrival/Departure 1.Adverse weather/turbulence/LVP 2.Terrain 3.Traffic Air or ground 4.Airport(WIP,,poor signage,etc) 5.TCAS RA/TA	**Operational Threats** 30. Operational Time Pressure. 31. Missed Approach 32. Flight Diversion 33. Unfamiliar Airport 34. other non-normal operation(e.g. RTO, Technical ferry flight)	**Cabin Threats** 40. Cabin event/distraction/interruption 41. Flight Attendant error	**Crew Support Threats** 80. Maintenance event 81. Maintenance error 82.Ground handling error 83.Dispatch/paperwork event 84.Dispatch/paperwork error 86.crew scheduling event 87.Manuals/chart incomplete or incorrect
Aircraft Threats 20. Aircraft malfunction 21. Automation event 22.Communication event(radio,ATIS etc)		**ATC Threats** 50. ATC Command (poor clearance, late changes etc) 51.ATC error 52. ATC language difficulty 53. ATC Non-standard phraseology 54. ATC radio congestion 55. Similar callsigns	**Other Threats** 99. Please describe in narrative.

6.4.9 Appendix G UAS Codes

Undesired Aircraft State Type

1	Abrupt aircraft control
2	Vertical deviation - altitude
4	Lateral deviation - heading
5	Speed too high
6	Speed too low
7	Unstable approach after bottom lines
8	Fuel imbalance
10	Fuel level below minimums
11	Near miss
12	Unstable go-around
13	Unstable take-off
14	Vertical deviation on the glideslope or path
16	Incorrect aircraft configuration
17	Unpressurized aircraft
22	Airspace penetration w/o ATC control authority
24	Lack of altitude protection
25	Wrong taxiway or ramp
26	Aircraft lined up for the incorrect runway
27	Aircraft control – excessive banking
28	Undesired system setup (switches and levers)
70	Long landing outside TD zone
71	Landing off centerline
72	Firm landing
73	Wrong airport
74	Wrong gate
75	Wrong runway
76	T/O off centerline
77	Taxi out of sequence
99	Other undesired states not listed in the code book

Nesma Airlines	**LOSA Observer Quick Reference Guide**	**Safety and Quality Department**
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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Observer ID		Observation Number	

Crew Observation Number (e.g., "1 of 2" indicates segment one for a crew that you observed across two segments)		Of	

Flight Demographics

City Pairs			
A/C Type	A320		
Pilot Flying (Check one)	CA		FO

Time from Pushback to Gate Arrival		Local Arrival Time	
Late Departure? (Yes or No)			

Rate the Operational Complexity of the flight *(This item is rated 1=low to 4=high.)*	Pre-Depart	T/O & Climb	Cruise	Des/Appr Landing	Overall
Assess the complexity of operating environment (Consider WX, ATC, Traffic, MEL's, abnormal and other events).					

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Pre-departure/Taxi

Narrative	Your narrative should provide a context. What did the crew do well? What did the crew do poorly? How did the crew manage threats, crew errors, and significant events? Also, be sure to justify your behavioural ratings.

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PERFORMANCE RATING

1	2	3	4
***Poor – Observed performance had safety implications**. This includes instances where necessary behaviour was not present, and examples of inappropriate behaviour that was detrimental.*	***Marginal- Observed performance meets minimum requirements**. This level of performance is less than desired for effective crew operations.*	***Good- Standard level of behaviour promotes and maintains crew effectiveness**. This is the level of performance that should be normally occurring in flight operations*	**Outstanding - Performance** represents exceptional skill in the application of specific behaviours, and serves as a model for teamwork – truly noteworthy and effective.

Planning Behavioral Markers			
Marker	**Aim**	***Standard***	**Rating**
SOP Briefing	The required briefing was interactive and operationally thorough	*Concise, not rushed, and met SOP requirements* *Bottom lines were established*	
Plans Stated	Operational plans and decisions were communicated and acknowledged	*Shared understanding about plans* *"Everybody on the same page"*	
Workload Assignment	Roles and responsibilities were defined for normal and non-normal situations	*Workload assignments were communicated and acknowledged*	
Contingency Management	Crew members developed effective strategies to manage threats to safety	*Threats and their consequences were anticipated* *Used all available resources to manage threats*	
tion Behavioral Markers			
Marker	**Aim**	***Standard***	**Rating**
Monitor/Crosscheck	Crew members actively monitored and cross-checked systems and other crew members	*Aircraft position, settings, and crew actions were verified*	
Workload Management	Operational tasks were prioritized and properly managed to handle primary flight duties	*Avoided task fixation* *Did not allow work overload*	
Vigilance	Crew members remained alert of the environment and position of the aircraft	*Crew members maintained situational awareness*	
Automation Management	Automation was properly managed to balance situational and/or workload requirements	*Automation setup was briefed to other members* *Effective recovery techniques from automation anomalies*	

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Review/Modify Behavioral Markers			
Marker	Aim	*Standard*	Rating
EVALUATION OF PLANS	Existing plans were reviewed and modified when necessary	*Crew decisions and actions were openly analysed to make sure the existing plan was the best plan*	
INQUIRY	Crew members asked questions to investigate and/or clarify current plans of action	*Crew members not afraid to express a lack of knowledge - "Nothing taken for granted" attitude*	
ASSERTIVENESS	Crew members stated critical information and/or solutions with appropriate persistence	*Crew members spoke up without hesitation*	

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Take-off/Climb

Narrative	Your narrative should provide a context. What did the crew do well? What did the crew do poorly? How did the crew manage threats, crew errors, and significant events? Also, be sure to justify your behavioural ratings.

Execution Behavioral Markers			
Marker	Aim	Standard	Rating
Monitor/Crosscheck	Crew members actively monitored and cross-checked systems and other crew members	*Aircraft position, settings, and crew actions were verified*	
Workload Management	Operational tasks were prioritized and properly managed to handle primary flight duties	*Avoided task fixation* *Did not allow work overload*	
Vigilance	Crew members remained alert of the environment and position of the aircraft	*Crew members maintained situational awareness*	
Automation Management	Automation was properly managed to balance situational and/or workload requirements	*Automation setup was briefed to other members* *Effective recovery techniques from automation anomalies*	
Review/Modify Behavioral Markers			
Marker	Aim	Standard	Rating
EVALUATION OF PLANS	Existing plans were reviewed and modified when necessary	*Crew decisions and actions were openly analysed to make sure the existing plan was the best plan*	
INQUIRY	Crew members asked questions to investigate and/or clarify current plans of action	*Crew members not afraid to express a lack of knowledge - "Nothing taken for granted" attitude*	
ASSERTIVENESS	Crew members stated critical information and/or solutions with appropriate persistence	*Crew members spoke up without hesitation*	

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Cruise

Narrative	Your narrative should provide a context. What did the crew do well? What did the crew do poorly?

Execution Behavioral Markers			
Marker	Aim	*Standard*	Rating
Monitor/Crosscheck	Crew members actively monitored and cross-checked systems and other crew members	*Aircraft position, settings, and crew actions were verified*	
Workload Management	Operational tasks were prioritized and properly managed to handle primary flight duties	*Avoided task fixation* *Did not allow work overload*	
Vigilance	Crew members remained alert of the environment and position of the aircraft	*Crew members maintained situational awareness*	
Automation Management	Automation was properly managed to balance situational and/or workload requirements	*Automation setup was briefed to other members* *Effective recovery techniques from automation anomalies*	
Review/Modify Behavioral Markers			
Marker	Aim	*Standard*	Rating
EVALUATION OF PLANS	Existing plans were reviewed and modified when necessary	*Crew decisions and actions were openly analysed to make sure the existing plan was the best plan*	
INQUIRY	Crew members asked questions to investigate and/or clarify current plans of action	*Crew members not afraid to express a lack of knowledge - "Nothing taken for granted" attitude*	
ASSERTIVENESS	Crew members stated critical information and/or solutions with appropriate persistence	*Crew members spoke up without hesitation*	

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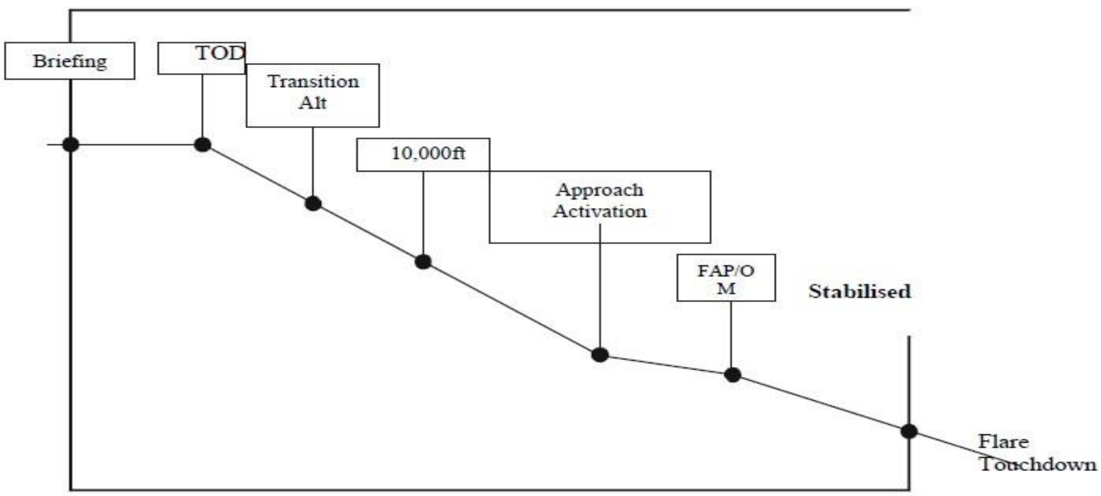
Nesma Airlines نسما للطيران	**LOSA Observer Information Form**	**Safety and Quality Department**

Descent/Approach/Land/Taxi



Descent/Approach/Land/Taxi

Narrative	" Describe significant events from the TOD to landing using the picture above to define landmarks. Talk about how the crew performed when confronted with threats and crew errors. Also, be sure to justify your behavioural ratings.

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

1	**Was the approach briefed before the TOD?** (Yes / No)	

2	**Did the crew begin the descent before or at the FMS TOD?** (Yes / No)	

3	**Did the aircraft get significantly above/below the FMS or standard path?** (Yes / No)	
		If "Yes", explain in the narrative the cause and whether the crew tried to regain the path.

4	**Approach flown?** (Check one)	**Visual**		**Instrument backup on visual approach?** (Check One)	**Yes**	
					No	
		Precision		**Type of precision**		
		Non-precision		**Type of non-precision**		

5	**Approach: Hand flown or Automation flown to minima?**	

6	**Did the aircraft get significantly above/below a desirable descent path?** (Yes	
		If "Yes", explain in the narrative the cause and whether the crew tried to regain the path.

7	**Landing** (Check One)	**Manual**		**Auto land**	
8	**Weather** (Check One)	**VMC**		**IMC**	

9	**Stabilized Approach Parameters**	**1000 AFE**	**500 AFE**
	Target airspeed between –5 and +10		
	Vertical speed ☐1000 fpm		
	Engines spooled		
	Landing configuration (Final flaps / gear		
	On proper flight path (G/S and localizer)		

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

1	**Was the approach briefed before the TOD?** (Yes / No)	
2	**Did the crew begin the descent before or at the FMS TOD?** (Yes / No)	
3	**Did the aircraft get significantly above/below the FMS or standard path?** (Yes / No)	

If "Yes", explain in the narrative the cause and whether the crew tried to regain the path.

4	**Approach flown?** (Check one)	**Visual**		**Instrument backup on visual approach?** (Check One)	**Yes**	
					No	
		Precision		**Type of precision**		
		Non-precision		**Type of non-precision**		

5	**Approach: Hand flown or Automation flown to minima?**	
6	**Did the aircraft get significantly above/below a desirable descent path?** (Yes	

If "Yes", explain in the narrative the cause and whether the crew tried to regain the path.

7	**Landing** (Check One)	**Manual**		**Auto land**	
8	**Weather** (Check One)	**VMC**		**IMC**	

	Stabilized Approach Parameters	**1000 AFE**	**500 AFE**
9	Target airspeed between –5 and +10		
	Vertical speed □1000 fpm		
	Engines spooled		
	Landing configuration (Final flaps / gear		
	On proper flight path (G/S and localizer)		

Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Planning Behavioural Markers			
Marker	Aim	Standard	Rating
SOP Briefing	The required briefing was interactive and operationally thorough	*Concise, not rushed, and met SOP requirements* *Bottom lines were established*	
Plans Stated	Operational plans and decisions were communicated and acknowledged	*Shared understanding about plans* *"Everybody on the same page"*	
Workload Assignment	Roles and responsibilities were defined for normal and non-normal situations	*Workload assignments were communicated and acknowledged*	
Contingency Management	Crew members developed effective strategies to manage threats to safety	*Threats and their consequences were anticipated* *Used all available resources to manage threats*	
Execution Behavioral Markers			
Marker	Aim	Standard	Rating
Monitor/Crosscheck	Crew members actively monitored and cross-checked systems and other crew members	*Aircraft position, settings, and crew actions were verified*	
Workload Management	Operational tasks were prioritized and properly managed to handle primary flight duties	*Avoided task fixation* *Did not allow work overload*	
Vigilance	Crew members remained alert of the environment and position of the aircraft	*Crew members maintained situational awareness*	
Automation Management	Automation was properly managed to balance situational and/or workload requirements	*Automation setup was briefed to other members* *Effective recovery techniques from automation anomalies*	
Review/Modify Behavioral Markers			
Marker	Aim	Standard	Rating
EVALUATION OF PLANS	Existing plans were reviewed and modified when necessary	*Crew decisions and actions were openly analysed to make sure the existing plan was the best plan*	
INQUIRY	Crew members asked questions to investigate and/or clarify current plans of action	*Crew members not afraid to express a lack of knowledge - "Nothing taken for granted" attitude*	
ASSERTIVENESS	Crew members stated critical information and/or solutions with appropriate persistence	*Crew members spoke up without hesitation*	

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Overall Flight

Narrative	This narrative should include your overall impressions of the crew.

1	2	3	4
Poor – Observed performance had safety implications.. This includes instances where necessary behaviour was not present, and examples of inappropriate behaviour that was detrimental.	*Marginal- Observed performance meets minimum requirements. This level of performance is less than desired for effective crew operations.*	*Good- Standard level of behaviour promotes and maintains crew effectiveness. This is the level of performance that should be normally occurring in flight operations*	**Outstanding:** Performance represents exceptional skill in the application of specific behaviours, and serves as a model for teamwork – truly noteworthy and effective.

Did you observe a flight attendant briefing on the first leg of the	Yes			Rating	
	No				
	Not observed				

Technical Proficiency					
Marker	Pre-Departure	T/O & Climb	Cruise	Des/Appr Landing	Specific Marker Comment
1 **Sterile cockpit SOP** used appropriately.					
Altitude and/or terrain awareness. Correct Altitude calls,FMA crosscheck, awareness of MSA and terrain					
Checklist compliance. normal and abnormal checklists in the prescribed manner, not read from memory, look at items being read, complete checklist and call out completion					

	CA	FO	Overall Crew Rating	Rating
Contribution to Crew Effectiveness				

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Nesma Airlines نسما للطيران	**LOSA Observer Information Form**	**Safety and Quality Department**

Overall Performance Markers		Ratings
COMMUNICATION ENVIRONMENT	Environment for open Communication was established and maintained.	
LEADERSHIP	Captain showed leadership and coordinated flight deck activities.	

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Nesma Airlines نسماللطيران	LOSA Observer Information Form	Safety and Quality Department

Threat Management Worksheet

Threats — Events or errors that originate outside the influence of the flight crew but require active crew management to maintain safety					
	Threat Description			**Threat Management**	
Threat ID	**Threat Description**	**Threat Code**	**Phase of flight** 1. Pre-depart/Taxi 2. Takeoff/Climb 3. Cruise 4. Des/App/Land 5. Taxi-in	**Effectively Managed?** Yes or No	Briefly describe how the crew managed or mismanaged the threat.
T1					
T2					
T3					
T4					
T5					

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Nesma Airlines نسما للطيران	**LOSA Observer Information Form**	**Safety and Quality Department**

Threat Codes			
Arrival/Departure 1.Adverse weather/turbulence/LVP 2.Terrain 3.Traffic Air or ground 4.Airport(WIP,poor signage) 5.TCAS RA/TA	**Operational Threats** 30. Operational Time Pressure. 31. Missed Approach 32. Flight Diversion 33. Unfamiliar Airport 34. other non-normal operation(e.g. RTO, Technical ferry flight)	**Cabin Threats** 40. Cabin event/distraction/interruption 41. Flight Attendant error	**Crew Support Threats** 80. Maintenance event 81. Maintenance error 82.Ground handling error 83.Dispatch/paperwork event 84.Dispatch/paperwork error 86.crew scheduling event 87.Manuals/chart incomplete or incorrect
Aircraft Threats 20. Aircraft malfunction 21. Automation event 22.Communication event(radio,ATIS etc)		**ATC Threats** 50. ATC Command (poor clearance, late changes etc) 51.ATC error 52.ATC language difficulty 53. ATC Non-standard phraseology 54. ATC radio congestion 55. Similar call signs	**Other Threats** 99. Please describe in narrative.

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Nesma Airlines	LOSA Observer Information Form	Safety and Quality Department

Error ID	**Error Management Worksheet** *Cockpit crew error is defined as a crew action or inaction that leads to a deviation from crew or organizational intentions or situational requirements*							
	Describe the error and any UAS	**Flight Phase:** 1.Pre-depart/Taxi 2.Takeoff/Climb 3.Cruise 4.Des/App/Land 5.Taxi-in	**Error Type** 1.Intentional noncompliance. 2.Procedural 3.Communication 4.Proficiency 5.Decision	**Error Code** *(use code book)*	**Who committed the error**	**Who detected the error?**	**Crew error response** 1.Trap 2.Exacerbate 3.Fail to Respond	**Error Outcome** 1.Inconsequential 2.UAS 3Additional error
E1								

	Error Management		**Undesired Aircraft State (UAS)**			
E	**Associated with a Threat?(Y/N)** If Y enter Threat ID	**Narrative on how crew managed or mismanaged the error**	**UAS Code** *(Refer to code book)*	**Who detected UAS?**	**Crew UAS response?** *1.Mitigate* *2.Exacerbate* *3.Fail to respond*	**UAS Outcome** *1.Recovery* *2.Incident* *3.Additional error*
E1						

Who committed/detected Codes
Flight Crew 1.Captain 2.FO 3.SO/FE 4.Relief pilot 5.Jumpseat 6.All crew members
Others: 8.ATC 9.Flight Attendant 10.Dispatch 11.Ground Handling 12. Maintenance
Aircraft: 20.Aircraft Systems
99. Other

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Error ID	**Error Management Worksheet** *Cockpit crew error is defined as a crew action or inaction that leads to a deviation from crew or organizational intentions or situational requirements*						
	Describe the error and any UAS	**Flight Phase:** 1.Pre-depart/Taxi 2.Takeoff/Climb 3.Cruise 4.Des/App/Land 5.Taxi-in	**Error Type** 1.Intentional noncompliance. 2.Procedural 3.Communication 4.Proficiency 5.Decision	**Error Code** *(use code book)*	**Who committed the error**	**Who detected the error?**	**Crew error response** 1.Trap 2.Exacerbate 3.Fail to Respond	**Error Outcome** 1.Inconsequential 2.UAS 3Additional error
E2								
	Error Management			**Undesired Aircraft State (UAS)**			
	Associated with a Threat?(Y/N) If Y enter Threat ID	**Narrative on how crew managed or mismanaged the error**		**UAS Code** *(Refer to code book)*	**Who detected UAS?**	**Crew UAS response?** *1.Mitigate* *2.Exacerbate* *3.Fail to respond*	**UAS Outcome** *1.Recovery* *2.Incident* *3.Additional error*
E2							

Who committed/detected Codes
Flight Crew 1.Captain 2.FO 3.SO/FE 4.Relief pilot 5.Jumpseat 6.All crew members
Others: 8.ATC 9.Flight Attendant 10.Dispatch 11.Ground Handling 12. Maintenance
Aircraft: 20.Aircraft Systems
99. Other

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Nesma Airlines نسما للطيران	LOSA Observer Information Form	Safety and Quality Department

Error ID	**Error Management Worksheet** *Cockpit crew error is defined as a crew action or inaction that leads to a deviation from crew or organizational intentions or situational requirements*							
	Describe the error and any UAS	**Flight Phase:** 1.Pre-depart/Taxi 2.Takeoff/Climb 3.Cruise 4.Des/App/Land 5.Taxi-in	**Error Type** 1.Intentional noncompliance. 2.Procedural 3.Communication 4.Proficiency 5.Decision	**Error Code** *(use code book)*	**Who committed the error**	**Who detected the error?**	**Crew error response** 1.Trap 2.Exacerbate 3.Fail to Respond	**Error Outcome** 1.Inconsequential 2.UAS 3Additional error
E3								
	Error Management				**Undesired Aircraft State (UAS)**			
E	**Associated with a Threat?(Y/N)** If Y enter Threat ID	**Narrative on how crew managed or mismanaged the error**			**UAS Code** *(Refer to code book)*	**Who detected UAS?**	**Crew UAS response?** *1.Mitigate* *2.Exacerbate* *3.Fail to respond*	**UAS Outcome** *1.Recovery* *2.Incident* *3.Additional error*
E3								

Who committed/detected Codes
Flight Crew 1.Captain 2.FO 3.SO/FE 4.Relief pilot 5.Jumpseat 6.All crew members
Others: 8.ATC 9.Flight Attendant 10.Dispatch 11.Ground Handling 12. Maintenance
Aircraft: 20.Aircraft Systems
99. Other

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Error ID	Error Management Worksheet *Cockpit crew error is defined as a crew action or inaction that leads to a deviation from crew or organizational intentions or situational requirements*							
	Describe the error and any UAS	**Flight Phase:** 1.Pre-depart/Taxi 2.Takeoff/Climb 3.Cruise 4.Des/App/Land 5.Taxi-in	**Error Type** 1.Intentional noncompliance. 2.Procedural 3.Communication 4.Proficiency 5.Decision	**Error Code** *(use code book)*	**Who committed the error**	**Who detected the error?**	**Crew error response** 1.Trap 2.Exacerbate 3.Fail to Respond	**Error Outcome** 1.Inconsequential 2.UAS 3Additional error
E4								

	Error Management		Undesired Aircraft State (UAS)			
E	**Associated with a Threat?(Y/N)** If Y enter Threat ID	**Narrative on how crew managed or mismanaged the error**	**UAS Code** *(Refer to code book)*	**Who detected UAS?**	**Crew UAS response?** *1.Mitigate* *2.Exacerbate* *3.Fail to respond*	**UAS Outcome** *1.Recovery* *2.Incident* *3.Additional error*
E4						

Who committed/detected Codes
Flight Crew 1.Captain 2.FO 3.SO/FE 4.Relief pilot 5.Jumpseat 6.All crew members
Others: 8.ATC 9.Flight Attendant 10.Dispatch 11.Ground Handling 12. Maintenance
Aircraft: 20.Aircraft Systems
99. Other

Extra Error Forms

LOSA Observer please use the extra forms as required and enter error code accordingly (e.g. E5)

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Error ID	Error Management Worksheet *Cockpit crew error is defined as a crew action or inaction that leads to a deviation from crew or organizational intentions or situational requirements*							
	Describe the error and any UAS	**Flight Phase:** 1.Pre-depart/Taxi 2.Takeoff/Climb 3.Cruise 4.Des/App/Land 5.Taxi-in	**Error Type** 1.Intentional noncompliance. 2.Procedural 3.Communication 4.Proficiency 5.Decision	**Error Code** *(use code book)*	**Who committed the error**	**Who detected the error?**	**Crew error response** 1.Trap 2.Exacerbate 3.Fail to Respond	**Error Outcome** 1.Inconsequential 2.UAS 3Additional error
E								
	Error Management			Undesired Aircraft State (UAS)				
E	**Associated with a Threat?(Y/N)** If Y enter Threat ID	**Narrative on how crew managed or mismanaged the error**		**UAS Code** *(Refer to code book)*	**Who detected UAS?**	**Crew UAS response?** *1.Mitigate* *2.Exacerbate* *3.Fail to respond*	**UAS Outcome** *1.Recovery* *2.Incident* *3.Additional error*	
E								

Who committed/detected Codes
Flight Crew 1.Captain 2.FO 3.SO/FE 4.Relief pilot 5.Jumpseat 6.All crew members
Others: 8.ATC 9.Flight Attendant 10.Dispatch 11.Ground Handling 12. Maintenance
Aircraft: 20.Aircraft Systems
99. Other

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Threat Management Worksheet

Threats — Events or errors that originate outside the influence of the flight crew but require active crew management to maintain safety					
	Threat Description			**Threat Management**	
Threat ID	**Threat Description**	**Threat Code**	**Phase of flight** 1. Pre-depart/Taxi 2. Takeoff/Climb 3. Cruise 4. Des/App/Land 5. Taxi-in	**Effectively Managed?** Yes or No	Briefly describe how the crew managed or mismanaged the threat.
T					
T					
T					
T					
T					

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6.5 Flight Data Analysis Program (FDAP)

1. **Definitions**

Accident: An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with intention of flight until such time as all such persons have disembarked, in which:

- A person is fatally or seriously injured as a result of:
  – Being in the aircraft;
  – 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 caused by other persons, or when injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
- 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 the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or the aircraft is missing or is completely inaccessible.

Notes:

1. For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.
2. An aircraft is considered to be missing when the official search has been terminated and wreckage has not been located.

As Low as Reasonably Practical (ALARP): means a risk is low enough that attempting to make it lower, or the cost of assessing the improvement gained in an attempted risk reduction, would actually be more costly than any cost likely to come from the risk itself.

Exceedance Detection: This looks for deviations from flight manual limits and standard operating procedures (SOPs). A set of core events should be selected to cover the main areas of interest to the operator. A sample list is provided at Appendix A of this CAAP. The event detection limits should be continuously reviewed to reflect the operator's current operating procedures.

Flight Data Analysis Program: A pro-active non-punitive program for gathering and analyzing data recorded during routine flights to improve flight crew performance, operating procedures, flight training, air traffic control procedures, air navigation services, or aircraft maintenance and design.

Hazard: A source of potential harm.

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

Risk: The chance of something happening that will have an impact on objectives.

Notes:

- A risk is often specified in terms of an event or circumstance and the consequence that may flow from it.
- Risk is measured in terms of a combination of the consequences of an event and its likelihood.
- Risk may have a positive or negative value.

Risk Assessment: The overall process of risk identification, risk analysis and risk evaluation.

Risk Identification: The process of determining what, where, when, why and how something could happen.

Safety: The state in which the probability of harm to persons or of property damage is reduced to, and maintained at, a level which is ALARP through a continuing process of hazard identification and risk management.

De-Identification: The process of hiding (*concealment*) what, where, when, why and how something happened.

Safety Management System (SMS): A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

Safety System: The application of engineering and management principles, criteria and techniques to optimize safety by the identification of safety related risks and eliminating or controlling them by design and/or procedures, based on acceptable system safety precedence.

2. **Introduction**

Historically the principal purpose of Flight Data Recorders (FDR) was to assist accident investigators to determine the cause of air crashes. This was possible by recovering the FDR and analyzing the recorded flight data. It also proved very useful in providing a better understanding of serious incidents. In the early 1970s a number of progressive operators appreciated the capabilities of FDRs and the valuable insights they could provide for the conduct of safe flight. Regularly gathering and analyzing flight data from the flight recorders revealed very useful information and provided operators the opportunity to understand more deeply what constituted a safe envelope for their flight operations. It also provided performance information of airframes and engines.

Today it is realized by aviation agencies and airlines alike that the practice of routinely analyzing recorded data from routine operations is a cornerstone in support of their accident prevention programs. Rather than reacting to serious incidents, operators have a very useful tool to proactively identify safety hazards and mitigate the risks.

A key element in developing any FDAP is gaining the support of the pilot group. This can be achieved by management and the pilot group entering a formal agreement or FDA procedure document. Amongst other things, the core conditions of the agreement will ensure that the program is non-punitive and de-identifies crew whilst ensuring the data gathered is secure.

ICAO, in recognition of the safety benefits of such programs, formally adopted their use and published a standard in Annex 6 Part I. It requires operators of air transport aeroplanes (more than 27 000 kg) to establish and maintain a FDAP (from 1 January 2005).

ECAR 121.5 and its guidance material EAC0011 provisions for a flight data analysis program to be part of Nesma airlines' safety management system.

3. **Purpose**

Nesma has a Flight Data Analysis Program that provides for the identification of hazards and the analysis of information and data associated with aircraft operations, to include:

a) Implementation of systematic processes for identifying and analyzing hazards and potentially hazardous conditions, to include:

- A systematic download and management of electronically recorded flight data from applicable aircraft.

b) Production of relevant analytical information and data for use by operational managers in the prevention of accidents and incidents, to include:

- Analysis of data that is performed in a consistent and standardized manner.
- Methods for detecting and analyzing events and data trends;
- Methods for developing and implementing corrective or remedial action to address adverse events or trends;
- A policy and/or procedures for ensuring remedial actions are taken in a non-punitive manner;
- The definition and application of safeguards that de-identify and ensure the security of program data and information.

4. **FDAP Benefits**

An FDAP is an essential element to a contemporary SMS. FDAP is used for the monitoring and analysis of flight operations and engineering performance data. Successful programs encourage adherence to SOPs and deter non-standard operations, consequently improving flight safety. They can also detect adverse trends in any part of the flight regime which can be mitigated by revision of SOPs, Air Traffic Control (ATC) procedures or understanding anomalies in aircraft performance.

FDAP is very useful in identifying exceedances of flight parameters that either indicate an underlying systemic issue or improper operating technique. This is established by comparing the specific flight to the fleet profile. For example, it would be possible to determine whether an unstable approach was an isolated event, or symptomatic of a wider mishandling problem due to a weakness in ATC procedures or improper flight management.

Flight data analysis can be used to detect flight parameter exceedances and to identify nonstandard or deficient procedures, weaknesses in the ATC system, and anomalies in aircraft performance. FDA allows the monitoring of various aspects of the flight profile, such as the adherence to the prescribed take-off, climb, cruise, descent, approach and landing SOPs. Specific aspects of flight operations can be examined to identify problem areas, or proactively prior to introducing operational change and subsequently, to confirm the effectiveness of the change.

During incident analysis, flight recorder data for the incident flight can be compared with the fleet profile data, thereby facilitating analysis of the systemic aspects of an incident.

Engine monitoring programs may utilize the automated analysis of flight recorder data for reliable trend analysis, as manually coded engine data are limited in terms of accuracy, timeliness and reliability. It is also possible to monitor other aspects of the airframe and systems.

In summary, FDA program offer a wide spectrum of applications for safety management, as well as improvements in operational efficiency and economy. Data aggregated from many flights may be useful to help:

- Determine day-to-day operating norms;
- Identify unsafe trends;
- Identify hazards in operating procedures, fleets, airports, ATC procedures, etc.;
- Monitor the effectiveness of specific safety actions taken;
- Reduce operating and maintenance costs;
- Optimize training procedures; and
- Provide a performance measurement tool for risk management programs

5. Objectives of FDAP

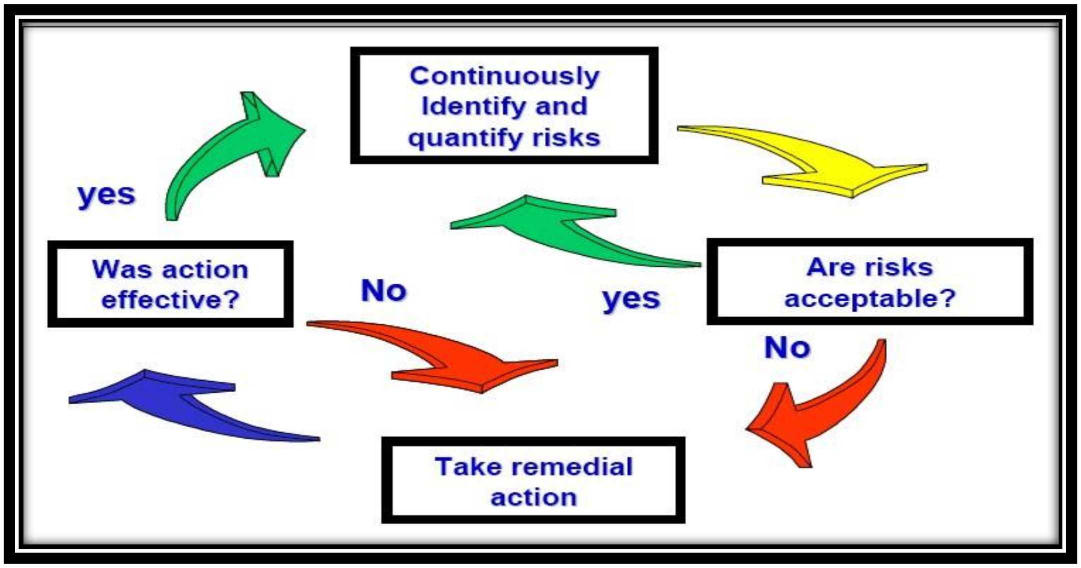
The primary objective of (FDA) is to enhance flight safety. This will be achieved by the routine monitoring of de-identified flight data. The FDA program is a non- punitive and contains adequate safe guards to protect data sources. The core objective and intent of Nesma Airlines FDA program is to facilitate the free flow of safety information.

FDAP will allow Nesma Airlines to:

- Collect operational flight data.
- Establish procedures for comparing the collected data to enhance safety in the following areas:

a) Flight procedures.
b) Flight training procedures and qualification standards
c) Crew performance in all phases of flight.
d) Air traffic control procedures.
e) Aircraft maintenance and engineering programs.
f) Aircraft and airport design and maintenance.

- Develop methods to analyze the collected flight data, such as triggered events and routine operational measurements.
- Perform trend analyses of FDA data to identify potential problem areas, evaluate corrective actions, and measure performance over time.
- Identify areas of operational risk and quantify current safety margins;
- Identify and quantify operational risks by highlighting when non-standard, unusual or unsafe circumstances occur;
- Use the FDAP information on the frequency of occurrence, combined with an estimation of the level of severity, to assess the safety risks and to determine which risks may become unacceptable if the discovered trend continues;
- Put in place appropriate procedures for remedial action once an unacceptable risk, either flight safety risk actually present or predicted by trending, has been identified; and
- Confirm the effectiveness of any remedial action by continued monitoring.



6. Using an FDAP

FDA data is commonly used today in a number of areas including:

- Exceedance detection;
- Routine measurements;
- Remedial Action;
- Incident investigations;
- Continuing airworthiness; and
- Integrated SMS.

6.1 Exceedance detection or triggered events

This looks for deviations from flight manual limits, and standard operating procedures. A set of core events should be selected to cover the main areas of interest to Nesma Airlines. NESMA AIRLINES Quality & Safety Director & Flight safety manager may also modify the standard set of core events (in accordance with the agreement with the chief pilot and the flight operations director) to account for unique situations regularly experienced, or the SOPs used.

They may also define new events (with the agreement of the pilots) to address specific problem areas.

Example: Restrictions on the use of certain flap settings to increase component life.

Care must be taken that, in order to avoid an exceedance, flight crew does not attempt to fly the FDA profile rather than follow SOPs. Such an action can quickly turn a poor situation into something worse.

All triggered Flight Events are extracted from N-SIGHT Software after being compiled on monthly basis.

The event detection limits must be continuously analyzed and reviewed to reflect Nesma Airline’s current operating procedures.

Some triggered events may include:

- Excessive pitch on takeoff;
- Climb out speed low or high during takeoff; and
- Excessive rate of descent below 1000 feet

6.2. Routine measurements

Ideally, data should be retained from all flights. At the very least a sufficient selection of measures will be taken from the fleet to ensure that normal practice is defined. Data will be recovered sufficiently frequently to enable significant safety issues to be considered and then mitigated. This may be accomplished by retaining select parameters at a given point in space. For example:

- Climb speed at 400 AAL;
- Flap retraction altitude/speed;
- Gear extension altitude/speed;
- Airspeed at 1000 feet AAL on approach; and
- Rate of descent at 1000 feet AAL on approach.

A comparative analysis can then be made between any given flight and the established profile for normal procedures. Undesirable trends may be identified before there are statistically significant numbers of events. Emerging trends and tendencies are monitored before the trigger levels associated with exceedances are reached.

6.3. Remedial Action

6.3.1 Remedial Action Policy:

It is important that the FDA program clearly defines the meaning of a non-punitive environment, or what is commonly known as a Just Culture, and that relevant program participants, particularly flight crew members:

- Have a clear understanding of the types of operational behaviors that are unacceptable, and the conditions under which disciplinary action would or would not apply.
- Are provided with enough information about the process to ensure a perception of fair treatment in accordance with program policy and procedures.
- Have confidence that non-punitive (or Just Culture) principles will be applied in the treatment of events identified under the FDA program.
- Within an FDA program, the application of non-punitive (or Just Culture) principles typically includes assurance that:

- Flight data and other relevant information are analyzed thoroughly such that, as far as reasonably practicable, all relevant factors associated with an event are identified, not just the action or inaction of specific individuals.
- Investigation of FDA events focuses on systemic issues that might influence behaviors, rather than on individual actions.
- Individuals involved in the investigation of an event will be treated fairly based on the quality of their behavioral choices.
- Factual details of an event are provided to relevant operational managers so that they may conduct a Just Culture review.

6.3.2 Mitigation Action Process

Determination of Mitigation action(s) shall follow the following process:

- Occurrence/Incident/Event/Event-Trend deep analysis by Flight Safety Office.
- Prepare a full report to include:

1. Risk Assessment Form – referred to as RA by Flight Safety Office
2. Event/Hazard/Occurrence repetition profile, covering RA Period
3. Event/Hazard/Occurrence actual captured value along with Event Min, Med and High values.
4. Event/Hazard/Occurrence top sponsors. This step is used to check if the event repetition circumstances (for specific airport, Sector, aircraft, PF, PIC or any other Event/Hazard/occurrence contributing factors.). <u>This step – by all means – shall not be included in Event/Hazard/Occurrence Risk Assessment Form. In other words, it is part of Safety Office internal analysis.</u>
5. Any previous mitigation action(s) with the concerned pilot and count of that mitigation action(s) with respect to the Event/Hazard/Occurrence in question. <u>This step – by all means – shall not be included in Event/Hazard/Occurrence Risk Assessment Form. In other words, it is part of Safety Office internal analysis.</u>

- Get the required Mitigation action regarding the concerned Pilot with respect the event in question taking into consideration application of SHELL Model and Balance between Safety and production.

- Determine the required Level of Mitigation Action. Levels of Mitigation actions as described in “Flight Safety Recommended Action” Report as follows:

1. No Action
2. Issue FCAN (Flight Crew Administrative Notice) for all pilots by Operations Department (Through FCAN Form)
3. Issue FCON (Flight Crew Operational safety Notice) for all pilots by Flight Safety Office. (Through FCON Form)
4. Pilot Briefing regarding the concerned event. (Through a Lecture/Discussion or through a Pilot Briefing Form)
5. The briefing is performed by Flight Safety Manager and attended by concerned pilot and chief pilot.
6. Pilot Interview (Investigation) performed by Flight Safety Manager and attended by concerned pilot and chief pilot and Operations Director. (Through Investigation Form)
7. Training (Course or SIM) preceded by Pilot Interview (Investigation).

- Issue “Flight Safety Recommended Action” Report including the required mitigation action and comments by Flight Safety Office.
- Mitigation Action Follow up regarding Event/Hazard/Occurrence as closed loop.

At any point the concerned pilot in question who is subject to formal Investigation, is freely allowed to invite for investigation participation – by his side - a legal person or highly experienced pilot according to his choice to attend the formal investigation. The latter name, ID and title shall be mentioned and recorded within the investigation report along with his signature.

6.4. Incident investigation

FDR data should be used in any investigation following an event that is considered to be an Immediately Reportable Matter. It has been found to be very useful in supplementing the flight crew report and will quantify impressions and information. System status and performance can also be determined, which may disclose cause and effect.

Nesma Airlines must retain flight recorder data following an Immediately Reportable Matter. In such instances, it is the responsibility of the CAA to investigate such matters and determine the seriousness of the occurrence and the circumstances. The usual program protocol of data confidentiality will probably not apply.

Examples of situations where recorded data could be useful:

i. Emergencies, such as:
- High-speed rejected take-offs;
- Flight control problems; and
- System failures;

ii. High cockpit workload conditions as verified by such indicators as:
- Late descent;
- Late localizer and/or glide slope interception;
- Large heading change below a specific height; and
- Late landing configuration;

iii. un-stabilized and rushed approaches, glide path excursions, etc.;

iv. exceedances of prescribed operating limitations (such as flap limit speeds, engine over-temperatures, V-speeds, and stall onset conditions; and

v. wake vortex encounters, low-level wind shear, turbulence encounters or other vertical accelerations.

6.5. Continuing airworthiness

Both routine and event data can be utilized to assist the continuing airworthiness function. For example, engine-monitoring programs look at measures of engine performance to determine operating efficiency and predict impending failures.

Examples of continuing airworthiness uses: engine thrust level and airframe drag measurements; avionics and other system performance monitoring; flying control performance; brake and landing gear usage.

6.6. Integrated safety analysis

The FDA database should be linked to other safety databases. These might include technical fault reporting systems and incident reporting systems. A more complete understanding of events becomes possible by cross-referencing the various sources of information. The confidentiality of the FDR data must be assured when databases are shared in this way.

The integration of all available sources of safety data provides the company SMS with viable information on the overall safety health of the operation.

For example, a flap over-speed results in:

- A crew report (provides the context);
- An FDA event (provides the quantitative description); and
- An engineering report (provides the result).

7. **Conditions for effective FDA program**

Several conditions that are fundamental to successful FDA programs are discussed below:

7.1 Protection of FDA data

- Airline management and pilots both have legitimate concerns regarding the protection of FDA data, for example:
- – Use of data for disciplinary purposes;
- – Use of data for enforcement actions against individuals or against the company, except in cases of criminal intent or intentional disregard of safety;
- – Disclosure to the media and the general public under the provisions of State laws for access to information; and
- – Disclosure during civil litigation.
- The integrity of FDA programs rests upon protection of the FDA data. Any disclosure for purposes other than safety management can compromise the voluntary provision of FDA data, thereby compromising flight safety. Thus, preventing the misuse of FDA data is a common interest of the State, the airlines and the pilots.

7.2 Essential trust

7.2.1 FDAP Safeguarding and de-identification

Refer to 13.7 of this Section.

As with successful incident reporting systems, the trust established between management and pilots is the foundation for a successful FDA program. This trust can be facilitated by:

- Early participation of the pilots' association in the design, implementation and operation of the FDA program;

- A formal agreement between management and the pilots, identifying the procedures for the use and protection of data.; and
- Data security and management.

7.2.2 The Confidentiality Protocol

The confidentiality protocol is a process for operating an effective Flight Data Monitoring (FDM) program whilst, at the same time, protecting the identity of the data to the fullest extent possible. The process is as follows:

1. The Flight Safety Officer along with Flight Operation and Flight Training department has a prepared list of the most critical N-SIGHT flight parameters,
2. Every flight sector in the N-SIGHT database will be compared against this list, and FD Analyzer will filter those sectors and its' associated events that fall into the 'Unacceptable' category of exceedance. The 'Unacceptable' flight events will be reviewed by Flight Safety Officer, who is trained to analyze the data,
3. The Flight Safety Officer, acting independently, will contact the pilot(s) concerned
4. They will together view and discuss the triggered events/event trend and/or playback of the N-SIGHT data, and It is expected that the fault (exceedance) will thereafter be self-corrected. However, if an individual is seen as continuing a trend of an 'Unacceptable' event, a proper remedial action will be set in motion. This will inevitably require the knowledge of Chief Pilot who will need to sanction additional training.
5. In some cases, when feedback is required – for specific follow up purposes - from one or more crew members regarding some aircraft operation issues which cannot be monitored by N-SIGHT, the identity of such crew members giving the feedback shall be kept de-identified at all times with no exception.

The Flight Safety Office will not identify Flight Crew involved in Safety events except for the following:

1. If the event is reported via an Air Safety Report,
2. In the case of repeated events by the same pilot reported to members of Safety Committee and in which the Chairman of Committee feel extra training would be appropriate, and

3. In other cases of repeated events by the same pilot; or a single pilot- induced event reported by the Safety Department to the members of Safety Committee and which the Chairman of the committee deems of such severity that the aircraft was seriously hazarded, or another flight would be if the pilot repeated the event.

7.2.3 Requisite safety culture

Consistent and competent program management characterizes successful FDA programs. Indicators of an effective safety culture include:

- Top management's demonstrated commitment to promoting a proactive safety culture,
- A non-punitive company policy. (The main objective of the FDA program must be to identify hazards, not to identify individuals who may have committed an unsafe act.);
- FDA program management by a dedicated staff within the safety department in coordination with operations departments, with a high degree of specialization and logistical support;
- Potential risks are identified through the correlation of the results of the analysis by persons with appropriate expertise. (For example, pilots experienced on the aircraft type being analyzed are required for the accurate diagnosis of operational hazards emerging from FDA analyses.);
- An efficient communication system for disseminating hazard information (and subsequent risk assessments) to relevant departments and outside agencies to permit timely safety action.

7.2.4 Program Review (Refer to SMM 1.4.2)

FDA program effectiveness is continually assessed. In other words, day after day, month after month to assess the effectiveness of program component and elements after taking the following inputs into consideration – for the overall FDAP analysis and assessment purposes:

1. FDAP stated goal achievement.
2. Safety Performance Indicators.
3. Identification of potential areas of improvement
4. FDAP data management, policies, methods and procedures
5. Other inputs

The Program review analysis end result shall construct an input for program development and enhancement after discussion with program stackholders.

8. FDA Team

FDA programs are often viewed as one of the most expensive safety systems in terms of the initial outlay, software agreements and personnel requirements. In reality, they have the potential to save the company considerable money by reducing the risk of a major accident, improving operating standards, identifying external factors affecting the operation and improving engineering monitoring programs.

Experience has shown that the "team" required to run an FDAP could vary in size from one person with a small fleet (e.g. 5 aircraft), to a dedicated section for large fleets. The descriptions below identify various functions to be fulfilled, not all of which need a dedicated position. For example, engineering may provide only part time support. All FDA team members require appropriate training or experience for their respective area of data analysis. Each team member must be allocated a realistic amount of time to regularly spend on FDA tasks. With insufficient available manpower, the entire program will under-perform.

Team leader (Quality & Safety Director (Team Leader)). Team leaders must earn the trust and full support of both management and flight crews. They act independently of other line management to make recommendations that will be seen by all to have a high level of integrity and impartiality. The individual requires good analytical, presentation and management skills.

Flight Safety Manager. This person may be a current pilot (or perhaps a recently retired senior Captain or trainer), or someone who knows the company's route network and aircraft. They will have in-depth knowledge of SOPs, aircraft handling characteristics, airfields and routes will be used to place the FDA data in a credible context, and he also cross-references FDA information with other air safety monitoring programs (such as the company's mandatory or confidential incident reporting program, and LOSA) creating a credible integrated context for all information. This function can reduce duplication of follow-up investigations.

Flight Safety Officer FDAP Functions

Flight Safety Officer is a practicing non-Operations management pilot trained to analyses and interpret DFDR/QAR data. His task is to act as an independent witness to the content of DFDR/QAR playbacks and adviser to pilots whose DFDR/QAR playbacks show non-standard performance. The data is first extracted from the main N-SIGHT database and technically verified by the Flight Safety

Office. Initially, only those sectors, to which N-SIGHT has attached red flags, will be selected for review by the Flight Safety Officer. The Flight Safety Officer then performs his own quality check on the content of the data before calling the pilots concerned to come and see and discuss the data themselves. The worldwide experience of other companies shows that this method is sufficient to cause pilots to avoid repetitions of non-standard practices in the future. This usually leads to an overall improvement in Operations Quality Assurance. However, if a pilot displays a trend of non-standard practice the Flight Safety Officer must act in accordance with the rules for disclosure above. In any case, the Flight Safety Officer must act in accordance with the confidentiality protocol.

Terms of Reference for the Flight Safety Officer

The specific tasks and General Responsibilities of a Flight Safety Officer are as follows:

- Confirm N-SIGHT events for operational validity,
- Review high risk events in detail and contact flight crews as necessary,
- Strictly apply the rules for disclosure of DFDR/QAR data,
- Strictly observe and practice the terms of the confidentiality Protocol,
- Participate in the production of statistical reports and safety trend,
- And risk analysis,
- Include operational comments and suggestions in reports when appropriate,
- Counsel pilots as necessary and in private when jointly viewing DFDR/QAR data, and
- In all matters upon which he cannot judge himself, he should refer to the Head of Safety and Quality.

Technical interpreter. This person interprets FDA data with respect to the technical aspects of the aircraft operation. They are familiar with the power plant, structures and systems, the company's requirements for information and any other engineering monitoring programs in use by the airline.

Flight safety assistant. This person provides full assistance to the flight safety manager in the FDA program processes

Chief Pilot / Training Manager. This person provides the link between the fleet or training managers and flight crew involved in circumstances highlighted by FDA. The position requires good communication skills and a positive attitude towards safety education. The person is normally a representative of the flight crew association and should be the only person permitted to connect the identifying data with the event. The aircrew representative requires the trust of both crewmembers and managers for their integrity and good judgement.

Engineering technical support. This person is normally an avionics specialist, involved in the supervision of mandatory serviceability requirements for FDR systems. They must be knowledgeable about FDA and the associated systems needed to run the program.

Replay administrator. This person is responsible for the day-to-day running of the system, producing reports and analysis. Methodical, with some knowledge of the general operating environment, this person keeps the program moving.

To be effective, team personnel that perform FDA functions specified in this section would typically have the following background, skills and/or capabilities:

Typical qualifications for Flight Safety Manager would include:

- Good management, analytical, presentation, diplomatic skills;
- A working knowledge and understanding of flight operations;
- The ability to effectively liaise with senior management and flight operations personnel (including flight crews), as well as with representatives from maintenance, safety, training, and applicable professional associations;
- Formal training or background experience in data processing, statistics and trend analysis.

8.1 FDA Team Training Policy and Process:

In general, selection of FDAP personnel training process will following the following policy:

- Personnel selection;
- Function-Related training courses;
- On Job Training - OJT;
- Show ability to perform function tasks - under supervision;
- Final Acceptance

Process breakdown:

1. When more resources are required to support more FDAP workload demand, Safety and Quality Department will announce the need for more resources to fulfill specific FDAP functions.

2. FDAP functions applicants shall be interviewed, evaluated – as an initial step - according to FDAP function required skills (Computer usage, Excel, word, English Language, …)
3. Accepted applicants shall go through specific formal training relevant to FDAP function qualification requirements. (Data Retrieval, validation, processing, animation …)
4. An On Job Training OJT – under supervision – shall be set in motion to train newly joined personnel on what, how and when to perform the assigned tasks to highest level possible.
5. By the end of OJT – newly joined personnel shall be assessed with respect to their ability to perform the assigned tasks to required level and precision.
6. More OJT under supervision – if required.
7. Final Acceptance of personnel.

8.2 FDA Team Training Requirements

FDAP personnel will receive training – when applicable - on the N-SIGHT software and Database Development, the training will include:

- Memory cards data download process
- The ways of data processing
- Flight data analysis
- Reporting
- Flight animations

Additionally, other training will be provided as new hardware and/or software is added to the program.

9. FDA Equipment Requirements

FDA programs generally involve systems that capture flight data, transform the data into an appropriate format for analysis, and generate reports and visualization to assist in assessing the data. The level of sophistication of the equipment can vary widely. Typically, however, the following equipment capabilities are required for effective FDA program:

i. An on-board device to capture and record data on a wide range of in-flight parameters (as altitude, airspeed, heading, aircraft attitude, and configuration);
ii. A means to transfer the data recorded on board the aircraft to a ground-based processing station. In the past, this largely involved the physical movement of the memory unit from the

quick access recorder (QAR) (either tape, optical disc, or solid state). To reduce the physical effort required, later transfer methods utilize wireless technologies;

iii. a ground-based computer system (using specialized software) to analyze the data (from single flights and/or in an aggregated format), identify deviations from expected performance, generate reports to assist in interpreting the read-outs, etc.;

iv. N-SIGHT Software with capability:

- For flight animation capability to integrate all raw data, presenting it as a simulation of in-flight conditions, thereby facilitating visualization of actual events.
- To Convert raw flight data into usable data for analysis;
- To Provide data quality checks to detect abnormalities;
- To Manage data de-identification;
- To Process data for event and exceedance detection, routine data measurement, event investigation and continued airworthiness investigation;
- To produce information and reports for trend analysis and follow-up action;
- Keeping Database(s) for data retention and retrieval.

9.1 Ground Equipment

The Engineering team uses HHDLU for downloading FDR data from aircraft and uses PCMCIA card for retrieving QAR files from MPC (Multi-Purpose Computer). Safety department uses N-SIGHT a flight data analysis system for processing and analysis of FDR/QAR data. N-SIGHT Flight data analysis system is programmed with threshold limits for a wide range of flight events, and, as far as possible, these limits reflect the Standard Operating Procedures (SOP) of the company and manufacturer. The system therefore detects and shows alert flags for non-standard events together with exceedances of aero plane limitations. Flight Data Analysis system stores raw and processed data in its database. List of Exceedances with limits (High, Med and Low) is ref. to 8.11 of this chapter.

9.2 The Flight Safety Analysis Program Tools are:

Flight data monitoring software

Nesma Airlines operates an approved Flight Data Monitoring System, which based on the regulatory guidelines and Industry best practices.

Nesma Airlines has a 100% flight data monitoring policy. Data monitoring is pro-active and non-punitive.

Flight data is routinely downloaded from all aircraft, processed through an N-SIGHT and stored in its database for viewing by the Flight Safety Office.

Nesma Airlines flight data monitoring program, that is non-punitive and contains adequate safeguards to protect data sources, includes a systematic acquisition, correlation and analysis of flight information derived from observations of flight crew performance during normal line operations and a combination of some or all of the following sources:

- Flight Data Analysis software;
- Confidential flight and Operational Air Safety reports (Ref. SMS Ch.7);
- Flight crew interviews;
- Quality assurance findings (Ref. Quality Assurance Program);
- Flight crew evaluation reports;
- Aircraft engineering and maintenance reports

9.2.1 N-SIGHT Navigation Process

1. Processing
2. Analysis
3. Reporting
4. Flight Replay
5. List and Trace
6. FAP Editor
7. Airport Visualization
8. Settings Manager
9. Fleet Manager
10. Support (link to support contact information)

10. FDA closed-loop process

Typically, Nesma airlines followed a closed-loop process in applying an FDA program as follows:

i. **Baseline established.** Initially, Nesma airlines establish a baseline of operational parameters against which changes can be detected and measured.

Examples: Rate of unstable approaches, or hard landings.

ii. **Unusual or unsafe circumstances (exceedance) highlighted.** The user determines when nonstandard, unusual or unsafe circumstances occur; by comparing them to the baseline margins of safety, the changes can be quantified.

Example: Increases in unstable approaches at particular locations.

iii. **Unsafe trends identified.** Based on the frequency of occurrence, trends are identified. Combined with an estimation of the level of severity, the risks are assessed to determine which may become unacceptable if the trend continues.

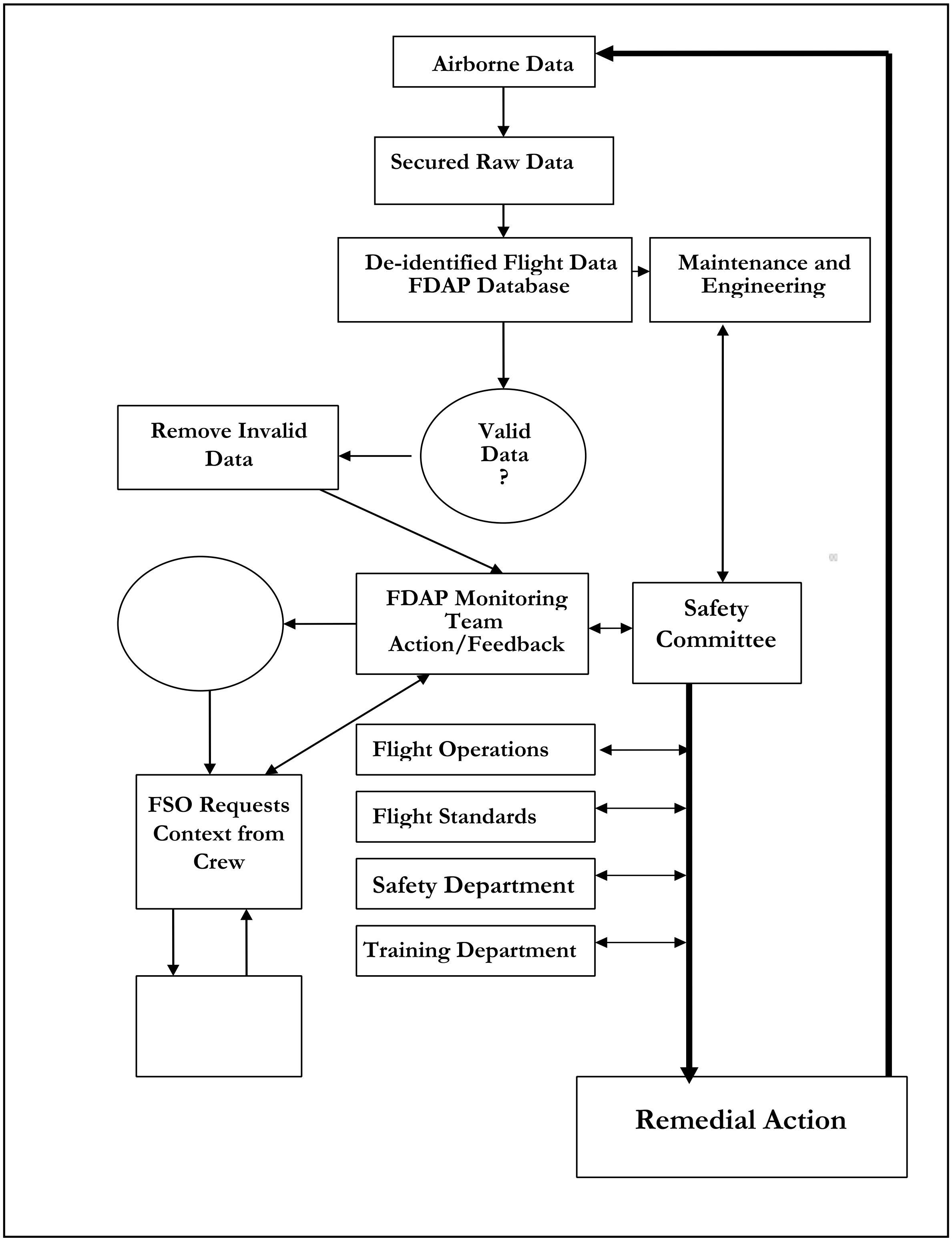
Example: A new procedure has resulted in high rates of descent that are nearly triggering GPWS warnings.

iv. **Risks mitigated.** Once an unacceptable risk has been identified, appropriate risk mitigation actions are decided and implemented.

Example: Having found high rates of descent, the SOPs are changed to improve aircraft control for optimum/maximum rates of descent.

v. **Effectiveness monitored.** Once a remedial action has been put in place, its effectiveness is monitored, confirming that it has reduced the identified risk and that the risk has not been transferred elsewhere.

Example: Confirm that other safety measures at the airfield with high rates of descent do not change for the worse after changes in approach procedures.



Airborne Data
Secured Raw Data
De-identified Flight Data FDAP Database
Maintenance and Engineering
Remove Invalid Data
Valid Data ?
FDAP Monitoring Team Action/Feedback
Safety Committee
Flight Operations
Flight Standards
Safety Department
Training Department
FSO Requests Context from Crew
Remedial Action

11. Implementing FDAP

It would be expected that a startup airline would take a minimum of two years to implement an effective monitoring program. Implementation would need to be a phased approach:

- Negotiation and implementation of pilot agreements;
- Implement and audit of data security procedures;
- Installation of equipment;
- Selection and training of personnel; and
- Commencement of data collection for analysis.

It is also considered essential that the FDAP is integrated seamlessly within the SMS to maximize safety benefits. The data provided by the program will provide quantitative information to support investigations that would be otherwise based on subjective reports.

12. FDAP Aims and Objectives

Any successful project needs to define the direction and objectives of the work. A preplanned phased approach is recommended so that the foundations are in place for future expansion into other areas. A building block approach will allow expansion, diversification and evolution of the program through experience.

For example, start with a modular system looking initially at basic safety related issues only. In the second phase add engine health monitoring. Ensure all systems either being used, or to be used, are compatible for the purposes of the program.

Set both short term and long term goals. A staged set of objectives starting from the first week's replay, moving through early production reports into regular routine analysis, allows the program to systematically complete aims and goals.

For example:

- **Short term:**

– Establish data download frequency and procedures, test replay software and identify aircraft defects;

– Validate and investigate exceedance data; and

– Establish a user-acceptable routine report format to highlight individual exceedances and facilitate the acquisition of relevant statistics.

- **Medium term:**
- – Produce an annual report - include key performance indicators;
- – Add other modules to analysis (e.g. Continuing Airworthiness); and
- – Plan for next aircraft fleet to be added to the program;
- **Long Term:**
- – Network FDA information across all company safety information systems;
- – Ensure FDA provision for any proposed advanced training program; and
- – Use utilization and condition monitoring to reduce spares holdings.

Initially to prove the program's effectiveness it is useful to start with a modest monitoring schedule by targeting areas of known interest. A focused and disciplined-approach is more likely to achieve the early aims and goals of the program that will lead to its success. For example, rushed approaches at certain airports, rough runways, high fuel usage on particular flight segments. Analysis of known problem areas is likely to generate useful monitoring methods for other locations and flight segments.

13. FDAP Procedures

The FDAP procedure document, or memorandum of understanding (MOU), is to be signed by all parties (airline management including the Flight Safety Manager and the Accountable Manager, flight crew member representatives nominated by the pilot union and the pilot association) will, as a minimum define:

- The aim of the FDAP;
- A data access and security policy that should restrict access to information to specifically authorized persons identified by their position;
- The method to obtain de-identified crew feedback on those occasions that require specific flight follow-up for contextual information; where such crew contact is required the authorized persons need not necessarily be the program manager, or safety manager, but could be a third party (broker) mutually acceptable to flight crew members representative and management;
- The data retention policy and accountability including the measures taken to ensure the security of the data;

- The conditions under which, on the rare occasions, advisory briefing or remedial training should take place; this should always be carried out in a constructive and non punitive manner;
- The conditions under which the confidentiality may be withdrawn (i.e. for reasons of gross negligence or significant continuing safety concern);
- The participation of flight crew member representative(s) in the assessment of the data, the action and review process and the consideration of recommendations; and
- The policy for the publishing the findings resulting from the FDAP.

13.1 Removal of Recording medium

Where older flight recording equipment is installed, and there is no opportunity to use a Quick Access Recorder (QAR) or equivalent to download data, Maintenance Department should coordinate the removal of the recording medium in harmony with maintenance schedules and/or routines. The removal time period should also coincide with recording medium memory capability and meet the Nesma Airline's need for a timely analysis of the data as defined in Nesma Airline's FDAP goals.

13.2 Procedure for the Movement of QAR and DFDR/QAR Discs

A. **Purpose:** To define processes for the movement of QAR and DFDR discs between the Engineering Department and the Safety Department and for the recording of information so as to enable control and tracking of the discs and flight data media files.

B. **Scope:** This process involves QAR data files, DFDR data on PCMCIA cards

C. Processes:

1. FDR/QAR data on PCMCIA Cards:

a) Engineering Department performs the data download from the aircraft FDR through a Hand Held Unit or retrieving QAR data on PCMCIA card fitted in MPC (Multi-Purpose Computer) during aircraft's weekly inspection.

b) FDR Downloaded data / PCMCIA Card handed over to MCC and FDR/QAR files will be uploaded to Safety-Security share folder on server. After uploading the data will be communicated to Safety team.

c) Further QAR files are uploaded to N-SIGHT Server through automation and processed by N-SIGHT software. FDR/QAR Data is Analyzed and validated by the FDR360 team and validated data will be made available for reviewing by Nesma team.

Procedure for Download and Process

Procedure for database Maintenance

Procedure for Technical Validation of Data and to Quantify Data Loss

Procedure for First Operational Filter (Red Flags)

Procedure for Investigation by Safety

Procedure for Investigation by Flight Safety Officer

Flight Safety Officer Records

Procedure for Trend Identification, Statistical Analysis and Risk Analysis.

Procedure for Preparation of Data for SAG.

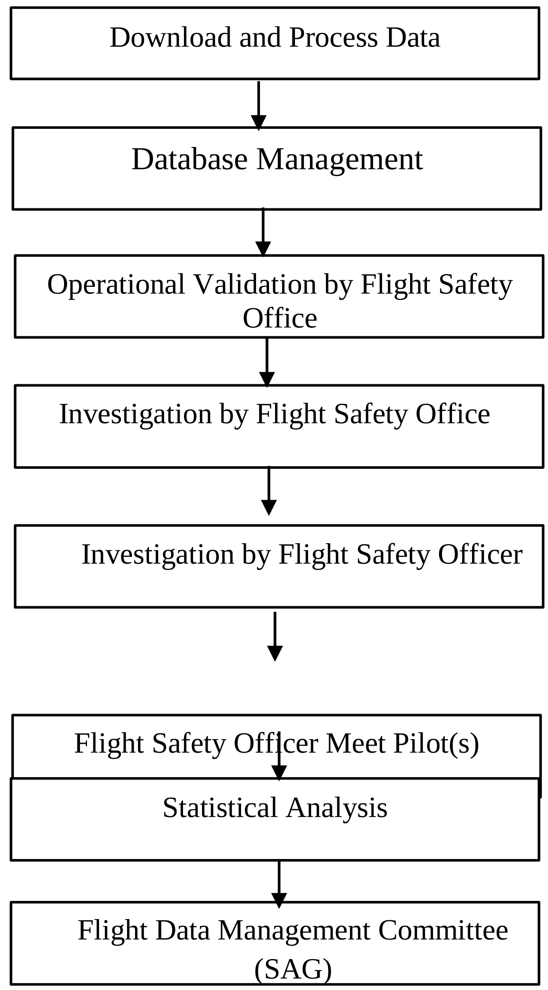


Figure 1 Flow Chart for the Movement of FDR/QAR Data

13.3 Procedure for Processing of FDR/QAR for Maintenance of the FDM Database

A. **Purpose:** To outline the general requirements for the processing of FDR/QAR and to outline the requirements for the maintenance of the FDM Database.

B. **Processes:**

1. **Processing**. In the act of processing FDR/QAR data, the objective must be not to lose any data either through mistake or through the vagaries of the processing software N-SIGHT. Total data loss through the system from the aero plane to the database can be as high as 10%.
2. **Database Maintenance.** N-SIGHT team will be updating database on receiving new Service bulletin from ATR, from time to time and update the respective parameters. Nesma engineering department will provide information to N-SIGHT team as and when a new Service Bulletin is received from ATR.
3. **Data Storage.** In the FDM system, processed data is automatically removed after 360 days. Unprocessed data is to be retained for 5 years. A copy of raw data is available with engineering system as a backup.

13.4 Technical and Operational Validation of FDM Data

A. **Purpose:** To outline the procedures for validating FDM data, to eliminate errors caused by technical error and by human error during data processing.

B. **Scope:** This procedure outlines only the high-level tasks involved. A Local Safety Procedure covers the step-by-step detail.

C. **Processes:**

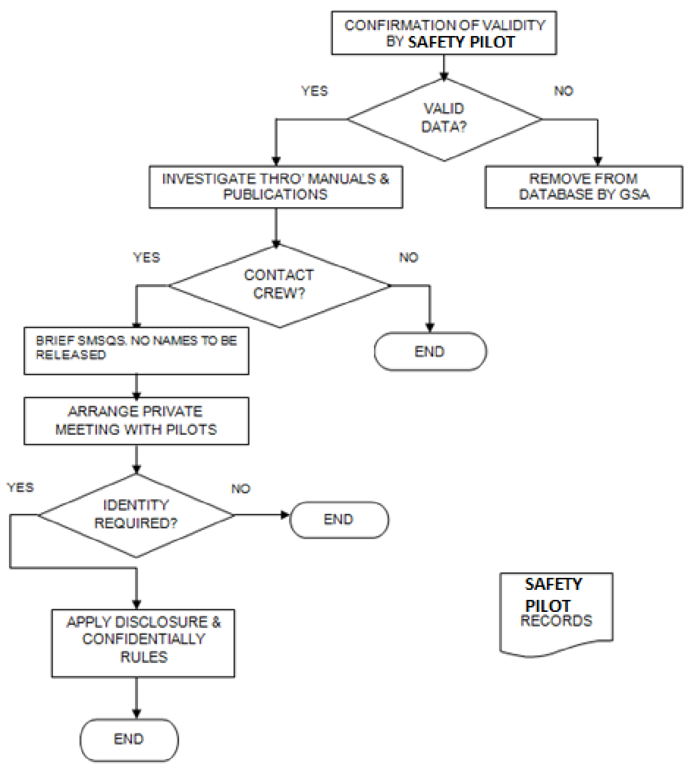
1. The overall process is performed in two stages. Firstly, a validation of data quality to ensure that all corrupted data is removed from the data newly inserted into the database. This inevitably leads to some loss, but a small amount of data may be recovered by processing the raw a second time. Secondly, a check is performed of all flights to ensure that the labeling of flights in the FDM database corresponds to the flights actually flown. This check ensures detection of error such as wrong aircraft registration, or wrong dates being entered on disc labels by engineering or within N-SIGHT by the GSC during processing,

2. **Validation of Data Quality.**
3. The N-SIGHT system automatically eliminates any flight which is not complete. However, in a few cases flights, which are incomplete, may still be retained by the system. N-SIGHT team is responsible for data revalidation
4. **Validation of Data Labeling.**
5. For each aircraft registration, the FDM system, Operations and Crew Management System records of flight numbers, dates and times are compared. A mismatch indicates a possible error either on the QAR/FDR data uploaded into FDM system during processing or loss of flight data. A correction must be made, and the data re- processed as necessary. Loss of data of more than 10% on any particular aircraft will be immediately brought to the notice of avionics engineering department for necessary maintenance action of the QAR recorder.

13.5 Flight Safety Officer Investigation and Confirmation of FDM Data

A. **Purpose:** To depict the process for the Flight Safety Officer to select and confirm the flights that shows any high exceedances (red flags).

B. Processes: The processes are as shown below:



13.6 Standard Protocols for Crew Contact

For validated event, the Safety and Quality director is responsible for initiating the standard protocol.

13.6.1 Submitted ASR:

Prior to contacting air crews, the flight Safety Manger will check if an Air Safety Report (ASR) was filed. The flight Safety Manger investigation may cease and continue as an ASR investigation.

a. Where an ASR has not been received or its information had been omitted, but it is evident from the flight data recording that an event has been triggered, flight Safety Manger will contact the chief pilot to prepare an interview with this crew.
b. Responses received from crew members will be de-identified by flight Safety Manger prior to being reviewed by the safety and quality director and forwarded to departments concerned. Following the review process, it will be decided to whether close the matter or conduct further enquiries.
c. Where further enquiries are pursued the flight Safety Manger become involved if requested to interview other flight crew members, the main purpose of the enquiry is to determine the root cause of an event and to prevent a re-occurrence.

13.6.2 Crew Report

A. If any flight is reported by the chief pilot or a crew himself, flight Safety Manger will identify the reported flight for review.
B. Flight Safety Manger will contact the crew of the concerned flight.

13.6.3 Filling Forms

After interview is completed the crew will fill the crew interview form and it will be signed by chief pilot and the flight Safety Manger then reviewed by the safety and quality director for department recording system.

13.6.4 Data Validation Protocol

The procedures for validating, reviewing, and defining event and trend definitions will be established by the Safety and Quality director and the flight Safety Manger They will determine whether the information is valid and reflects NESMA AIRLINES standards, training practices, and aircraft performance limits. All changes in the event and trend definitions will be logged and the Safety and Quality Manager will maintain the records.

13.6.5 Information and Data Control

The Safety and Quality director and the flight Safety Manger will maintain a history of the information used in the department. When a FDA trend or safety issue is identified, a log will be maintained to provide a reference document. This document will provide a way to track how NESMA AIRLINES addresses trends revealed by analysis of the FDA data. This will include:

- A description of the identified issue.
- Analysis that was accomplished.
- Specific corrective actions or recommendations taken or made.
- Personnel who were notified (e.g., flight crews [de-identified], Engineering.
- Maintenance, Flight Operations, Flight Training, Flight Safety).
- Resolution of actions or recommendations.

13.7 Disclosure of DFDR/QAR Data

As per Safety Committee Recommendations and FDAP confidentiality protocol, Full access to DFDR/QAR data is available to selected personnel from Safety Department. All working stations (computers) that have N-SIGHT software, are only accessed through login password(s). In addition, login to N-SIGHT software itself shall also be through a predefined login password for each individual user. DFDR/QAR data may be identified only for the following reasons:

1. Accident,
2. When the PIC identifies himself by submitting an ASR,
3. When there is a complaint or allegation from an outside authority or agency,
4. When the PIC gives permission for identification,
5. When a serious departure from SOP is apparent and Flight Safety Office evaluates the event or even the whole flight as high risk and it has gone unreported by the crew involved. Then identification must be approved by the DFO before the incident/Event can be investigated, and Confidentiality may be withdrawn in cases such as willful misconduct and/or gross negligence.
6. when disclosed under the terms of the confidentiality protocol

13.8 Data Analysis and follow-up

Data Analysis and Follow-up process:

1. **<u>Highlight Findings</u>**: FDAP finding (e.g. hazards, adverse events and trends, airworthiness issues, etc.) shall be coordinated with relevant operational areas of Nesma Airlines for further validation and assessment – when required.
2. **<u>Confirmation of Findings</u>**: FDAP findings (e.g. hazards, adverse events and trends, airworthiness issues, etc.) are confirmed by relevant operational area(s) after being investigated – if required.
3. **<u>Mitigation of Findings</u>**: Determination of appropriate action to eliminate/correct such findings.
4. **<u>Mitigation Action Application</u>**: Follow-up of the determined appropriate action, i.e. applied as planned
5. **<u>Feedback</u>**: Assess/evaluate that highlighted finding(s) are eliminated/reduced/ corrected or not?

Data Analysis and Follow-up procedure:

i. FDA data are usually compiled on a monthly basis. The data should then be reviewed by Flight Safety Officer to identify specific exceedances and emerging undesirable trends (Refer to SMM Ch. 2) and to disseminate the information to flight crews.

ii. If deficiencies in pilot handling technique are evident, the information is de-identified in order to protect the identity of the flight crew. The information on specific exceedances is handled by flight safety manager for confidential discussion with the pilot. Then give advice and recommendations for appropriate action, such as re-training for the pilot (carried out in a positive and non-punitive way); revisions to operating and flight manuals; changes to ATC and airport operating procedures; etc.

iii. As well as reviewing specific exceedances, all events are archived in a database. The database is used to sort, validate and display the data in easy-to understand management reports.

iv. Lessons learned from the FDA program may warrant inclusion in the company's safety promotion programs. Care is required, however, to ensure that any information acquired through FDA is studiously de-identified before using it in any training or promotional initiative.

v. As in any closed-loop process, follow-up monitoring is required to assess the effectiveness of any corrective actions taken. Flight crew feedback is essential for the identification and resolution of safety problems and could comprise answering the following questions, for example:

- Are the desired results being achieved soon enough?
- Have problems really been corrected, or just relocated to another part?
- Have new problems been introduced?

vi. All successes and failures should be recorded, comparing planned program objectives with expected results. This provides a basis for review of the FDA program and the foundation for future program development.

vii. All maintenance related events will be reviewed with the chief inspector for verifying that the action taken was complies with recorded data.

13.9 Flight Safety Office FDA Reports:

- The Flight Safety officer and Flight Safety assistant will be responsible for developing reports summarizing the information obtained through the N-SIGHT system including events' Risk Assessment, forecasted trends, deficiencies, findings and airworthiness issues.
- The reports will include summaries of the most recent information obtained as well as trend information to demonstrate the effectiveness of prior corrective actions.
- These reports will be presented to the Safety and quality director (usually on monthly basis) on a regular basis unless the situation dictates for shorter period. These summary reports shall be discussed within Safety Committee.
- The reports will include recommendations in order to improve their usefulness as the program proceeds.
- Flight Safety Office shall distribute FDAP summary reports – electronically - to concerned operational areas as required.

13.10 Record Keeping by Flight Safety Office

A. **Purpose:** To define the information to be recorded by Flight Safety Office and the rules governing the confidentiality and storage of the records.

B. **Scope:** This procedure applies to the Flight Safety Office.

C. Processes:

1. The FDM records maintained within N-SIGHT by the Safety Department are identifiable. At the completion of Procedure on Technical and Operational Validation of Data by the Group Safety Office, the shortlist of flights offered to the Flight Safety Officer will still contain identifiable data. This data is protected and is accessible to safety staff and Flight Safety Officers,
2. Flight Safety Office shall also protect the records of their data investigation and confirmation,
3. Records of the names of pilots they have listed for playback viewing and discussion shall be kept in electronic format and only available to those working in the Safety Department and the Flight Safety Officers. Any notes made during the data investigation and confirmation, and any notes made at interviews shall be destroyed by shredding when those notes have been turned into the proper electronic record,
4. The Records to be maintained by the Flight Safety Officers are as follows:

a. A list of the pilots to be met for playback viewing and discussion, and

b. A record of every meeting with every pilot on separate forms. The format is maintained in an electronic database accessible to the Safety Department staff only.

c. Flight Safety Officer Records shall be retained for one year only. Flight Safety Officers are responsible for reviewing the records regularly and at a minimum of every two months, to ensure that records are not retained longer than one year.

Database

Nesma Airlines has an electronic database to ensure effective management of data derived from the flight safety analysis program.

LIST OF PARAMETER EXCEEDENCES A320 Family

(Please refer to Appendix xx)

14. **FDA Event Definitions**

The event list had been tailored to NESMA AIRLINES and its aircraft's type. The parameters used to measure the event need to be recorded on that aircraft type. Next, the tolerances that trigger the events should be set to account for applicable regulations, aircraft limitations, and company policies and procedures. The safety and quality department N-SIGHT Team should work together to evaluate and adjust event triggers. Since maintenance will also be an important stakeholder.

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	Alpha-floor protection activated	Alpha floor trigger	#	#	#	
A320	Alternate Law activated	Alternate law trigger	#	#	#	
A320	Altitude Above Maximum Operating Altitude	Max Alt FCOM	#	#	#	
A320	Autoland Alert activated	When Autoland warning from FWS is Triggered	#	#	#	
A320	Autoland Detected	#	#	#	If Autopilots engaged during landing	
A320	Direct Law activated	DLAW	#	#	#	
A320	GPWS Alert detected (Mode Unknown)	_GPWS_WARNING =Unknown Mode	#	#	#	

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	GPWS Altitude Loss After takeoff or Go-Around (Mode 3)	_GPWS_WARNING =Mode3	#	#	#	
A320	GPWS Excessive Rate of Descent (Mode 1)	_GPWS_WARNING =Mode1	#	#	#	
A320	GPWS Excessive Terrain Closure Rate (Mode 2)	_GPWS_WARNING =Mode2	#	#	#	
A320	GPWS Excessive descent below Glide Slope (Mode 5)	_GPWS_WARNING =Mode5	#	#	#	
A320	GPWS Terrain clearance not sufficient (Mode 4)	_GPWS_WARNING =Mode4	#	#	#	
A320	Ground Spoiler not armed	Not armed during take off or while crossing 100ft in Approach	#	#	#	
A320	Long Holding detected	Two full race course pattern +	#	#	#	
A320	Reduced Flap Landing	Less than CONF3	#	#	CONF3	
A320	Speed Above MMO	MMO + 0.004 Time > = 6s	MMO + 0.004 Time > = 3s	#	#	
A320	Speed Brakes Extended in Final Approach (below 1000 ft)	AB out in Final APP	#	#	#	

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	Takeoff Config Warning detected	TO	#	#	#	
A320	Windshear Alert activated	Windshear Reactive	#	#	Wind Shear Reactive	
A320	High Thrust during Taxi	50% / 1.2EPR	45% / 1.15EPR	42% / 1.1EPR	#	%
A320	Overweight Landing detected	MLW as per FCOM	#	#	#	Kg
A320	Deviation from Localizer	1.5	1	0.5	#	dots
A320	Early Flaps Retration after Takeoff	700	800	900	#	ft
A320	Flaps/Slats Extended above Maximum Altitude	20200 for all SA CEO and 20000 for SA NEO	#	#	#	ft
A320	Go Around detected	#	<= 200	>= 200	#	ft
A320	High Height at Runway Threshold	80	70	60	#	ft
A320	Landing Gear Not Locked Down Alert activated	1000	#	#	#	ft
A320	Late Flaps Setting before Landing	500	750	1000	#	ft

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	Late Landing Gear Retraction	ALTITUDE>500 (if GOA , _ALTITUDE >700)	ALTITUDE >300 (if GOA , _ALTITUD E >500)	ALTITUDE>200 (if GOA , _ALTITUDE >400)	#	ft
A320	Late Thrust Reduction at Landing	On ground 2s	On ground	ralt <= 5ft	#	ft
A320	Level Bust detected	350	250	150	#	ft
A320	Low Height at Runway Threshold	25	30	35	#	ft
A320	Reversers selected in Flight detected	REV	#	#	#	ft
A320	Bounced Landing detected	400	200	#	#	ft/min
A320	High Rate Of Descent (FL100 - FL30)	-3500	-3000	-2500	#	ft/min
A320	High Rate of Descent in Approach (1000 ft - 500 ft)	-1500	-1300	-1100	#	ft/min
A320	High Rate of Descent in Approach (2000 ft - 1000 ft)	-1800	-1500	-1200	#	ft/min
A320	High Rate of Descent in Approach (3000 ft - 2000 ft)	-3000	-2500	-2000	#	ft/min

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	High Rate of Descent in Approach (below 500 ft)	-1300	-1100	-1000	#	ft/min
A320	Low Rate of Climb (below 1000 ft)	500	750	1000	#	ft/min
A320	High Vertical Speed before Touchdown	-10	-8	-6.5	#	ft/s
A320	High Lateral Acceleration at Takeoff	0.3	0.2	0.15	#	g
A320	High Lateral Acceleration at Touchdown	0.3	0.2	0.15	#	g
A320	High Vertical Acceleration at Takeoff	1.45	1.4	1.35	#	g
A320	High Vertical Acceleration at Touchdown	1.75	1.6	1.5	#	g
A320	High Vertical Acceleration in Flight	1.8g : 0.2g	1.6g : 0.4g	1.4g : 0.6g	#	g
A320	Suspected Wrong Altimeter Setting LAN	#	#	#	delta>=3	hPa
A320	Suspected Wrong Altimeter Setting TKO	#	#	#	delta>=3	hPa
A320	High Reversers Thrust at Low Speed	45	55	65	#	KT

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	High Speed after Takeoff or Go-Around	V2 + 50 TOL > = 3s	V2 + 40 TOL > = 3s	V2 + 30 TOL > = 3s	#	kt
A320	High Speed in Approach (1000 ft)	25	20	15	#	kt
A320	High Speed in Approach (Below 2500 ft)	250	230	220	#	kt
A320	High Speed in Approach (at 50 ft)	15	11	8	#	kt
A320	High Speed in Approach (at 500 ft)	20	15	10	#	kt
A320	High Tail Wind at Landing (50 ft)	15	12	10	#	kt
A320	High Taxi Speed in Staight Line	40	35	32	#	kt
A320	High Thrust during Line-Up	65	60	55	#	kt
A320	Low Speed	-10	-7	-3	#	kt
A320	Low Speed at Take Off or Go Around	-2	2	6	#	kt
A320	Low Speed in Approach (1000 ft)	-10	-8	-5	#	kt

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	Low Speed in Approach (at 50 ft)	-10	-8	-5	#	kt
A320	Low speed in Approach (at 500 ft)	-10	-8	-5	#	kt
A320	Rejected Takeoff Detected	CAS>100	100=>CAS >80	80=>CAS> 50	#	kt
A320	Speed Above Maximum Tire Speed	195	#	#	#	kt
A320	Speed Above Recommended Turbulence Speed	MACH>0.76 TOL > = 600s, CAS > 275	MACH>0.76 TOL > = 300s, CAS > 275	MACH>0.76 TOL > = 120s, CAS > 275	#	kt
A320	Speed Above VLE	As per FCOM	#	#	#	kt
A320	Speed Above VMO	VMO + 4 TOL > = 6s	VMO + 4 TOL > = 3s	#	#	kt
A320	Speed High at Touch down	10	8	0	#	kt
A320	Speed Low at Touch down	-10	-8	-5	#	kt
A320	Speed above 250 kts (below 10000 ft)	#	#	#	If STD Altitude < 9500 ft and CAS >255 kt and TOL >=10 sec and flight phase = descent	kt

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	Speed above VFE	VFE + 4 for time >3 s	VFE for Time >3 s	#	#	kt
A320	Speed above VLO (Extension)	As per FCOM	#	#	#	kt
A320	Speed above VLO (Retraction)	As per FCOM	#	#	#	kt
A320	Taxi Speed High in 180° Turn	10.5	9	7.5	#	kt
A320	Taxi Speed High in Turn	21	18	15	#	kt
A320	Long Flare Distance	1050	900	750	#	m
A320	Short Flare Distance	250	350	450	#	m
A320	Questionable Braking at Rollout	-0.45	-0.4	-0.35	#	m/s2
A320	High Longitudinal Deceleration at Landing	2.5	2	#	If LDA info NA from Database	m/s²
A320	Asymmetric Thrust in Flight	(N1 Delta >10 %, Delta EPR >0.05) for Time 60	(N1 Delta >10 %, Delta EPR >0.05) for 30	(N1 Delta >10 %, Delta EPR >0.05) for 10	#	s

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	Asymmetric Thrust in Reverse	(N1 Delta >10 %, Delta EPR >0.05) for 15	(N1 Delta >10 %, Delta EPR >0.05) for 10	(N1 Delta >10 %, Delta EPR >0.05) for 5	#	s
A320	AutoPilot off detected in cruise	1800	900	180	#	s
A320	Dual Stick Inputs detected	_Dual for Time >=3	_Dual for 0.25<=Time <3	#	#	s
A320	Engine in Flight Shutdown detected	EngOff > 20	#	#	#	s
A320	Late Reversers Selection at Landing	Reversers not engaged when CAS < 50 after touchdown	Reversers not engaged till 10 s after Touchdown	Reversers not engaged till 5 s after Touchdown	#	s
A320	Long Flare Time	14	12	10	#	s
A320	Short Flare Time	3	4	5	#	s
A320	Smoke Warning activated	_SMOKE for time >= 5 s	#	#	#	s
A320	Speed Brakes Out with Thrust	_ENG_SPDBRK > 60% N1 or 1.15 EPR for more than 60 seconds	_ENG_SPDBRK > 60% N1 or 1.15 EPR for more than 40 seconds	_ENG_SPDBRK > 60% N1 or 1.15 EPR for more than 20 seconds	#	s

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	TCAS RA alert activated	TCAS_RA triggers for 3 seconds	#	#	#	s
A320	Excessive Rudder Inputs (above 200 ft)	5.7	4.2	#	#	°
A320	Heading Deviation at Takeoff (100 kt - Rotation)	4	3	2	#	°
A320	Heading deviation at Landing (above 60kt)	5	4	3	#	°
A320	High Bank Angle during Flare below 10 ft	9	7	5	#	°
A320	High Bank Angle in Approach (1000 ft - 400 ft)	35	30	25	#	°
A320	High Bank Angle in Approach (400 ft - 100 ft)	20	15	10	#	°
A320	High Bank Angle in Approach (above 1000 ft)	40	36	32	#	°
A320	High Bank Angle in Approach (below 100 ft)	10	8	6	#	°
A320	High Bank Angle in Climb (100 ft - 400 ft)	25	20	15	#	°

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	High Bank Angle in Climb (400 ft - 1000 ft)	35	30	25	#	°
A320	High Bank Angle in Climb (up to 100 ft)	10	8	6	#	°
A320	High Heading change in Approach (below 500 ft)	20	15	5	#	°
A320	High Pitch at Takeoff	12	11	10	#	°
A320	High Pitch at Touchdown	10.2	9.2	8.2	#	°
A320	High Pitch in Climb	21	20	19	#	°
A320	High above Glideslope (above 1000 ft)	-1.5	-1	-0.5	#	°
A320	High above Glideslope (from 1000 ft - 200 ft)	-1.5	-1	-0.5	#	°
A320	High on Vertical Profile in Approach (1200 ft)	0.95	0.7	0.4	#	°
A320	High on Vertical Profile in Approach (400 ft)	0.95	0.7	0.4	#	°

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	High on Vertical Profile in Approach (800 ft)	0.95	0.7	0.4	#	°
A320	Inadvertent Brakes Application at takeoff	Brake Pedal >= 14 for >= 1 second or 14 > Brake Pedal >= 3 for >= 2 seconds or 3 > Brake Pedal > 0 for >= 4 seconds	14 > Brake Pedal >= 3 for == 1 second or 3 > Brake Pedal > 0 for >= 2 seconds	3 > Brake Pedal > 0 for == 1 second	#	°
A320	Low Pitch at Touchdown	0.5	1	2	#	°
A320	Low Pitch in Climb	8	10	12	#	°
A320	Low below Glideslope (above 1000 ft)	1.5	1	0.5	#	°
A320	Low below Glideslope (from 1000 ft - 200 ft)	1.5	1	0.5	#	°
A320	Low on Vertical Profile in Approach (1200 ft)	-0.8	-0.6	-0.4	#	°
A320	Low on Vertical Profile in Approach (400 ft)	-0.8	-0.6	-0.4	#	°
A320	Low on Vertical Profile in Approach (800 ft)	-0.8	-0.6	-0.4	#	°

Fleet	Event Name	High	Medium	Low	Info	Unit
A320	High Pitch Rate at Landing	3	2.5	2	#	°/s
A320	High Pitch Rate at Takeoff	6.5	5.5	4.5	#	°/s
A320	Low Pitch Rate at Takeoff	1.5	2	2.25	#	°/s
A320	High EGT	EGT of either engine > MCT EGT at TO (Refer FCOM) for >= 2 seconds	EGT of either engine > High - (High - MCT EGT) / 3 (Refer FCOM) for >= 2 seconds	EGT of either engine > (MCT EGT at TO + 5) (Refer FCOM) for >= 2 seconds	#	°C

	Air Safety Report	**Safety & Quality Department**
Name:	**POS.**	**ID #:**
Date of Event (DD/MM/YY)	**Time of Event UTC** **DAWN/DAY/DUSK/NIGHT/---------**	**Flight Number**
Flight Route **From: To:** **DIVERT CITY (if applicable):**	**Location of Event (If applicable)**	**Gate # (If applicable)**
	Aircraft Registration:	**Aircraft Type:**
Flight phase (circle one or all that apply) **Parked – Push-Back-Taxi-out-Takeoff-Initial Climb-Climb** **Cruise-Holding-Descent-approach-Go Around-Missed Approach-Landing-Taxi-in-Parking**		
Runway # (if applicable)	**Runway Condition (if applicable)**	**In-flight/Airfield Wx./ATIS** IMC/VMC/OTHERS
RTO speed	**Aircraft Altitude/FL**	**RVSM** YES/NO

Event Title			
☐ Aircraft Damage	☐ Exceedence (Sys/limit)	☐ SOPs	☐ TCAS/Near Air Miss
☐ ATC communication	☐ Excursion TWY/RWY	☐ Overweight Handling	☐ Use of Reserve Fuel
☐ Bird/Lighting Strike	☐ Incursion TWY/RWY	☐ Pax Illness / DR. Kit	☐ Weight and Balance
☐ Communication Deficiency	☐ Fire or smoke warning	☐ Ramp Safety	☐ Wind Shear
☐ Dangerous Goods	☐ FOD damage/concern	☐ Rejected Take-off (RTO)	☐ (Pred.) Wind Shear
☐ Deviation (ATC-ALT)	☐ Go-Around	☐ Return from flight	☐ Braking Malfunction
☐ Diversion	☐ GPWS/EGPWS (TERR)	☐ Safety Equipment	☐ Other Safety Concerns
☐ Disruptive Passenger	☐ Ground Support Deficiency	☐ Security Breach	
☐ Emergency	☐ Taxi concern	☐ Severe Turbulence	
☐ Engine Shutdown/Failure	☐ Handling Difficulties	☐ Tail Strike	
	☐ Navigational Concern		

Factual description of event with any relative factors (weather, ATC, airfield facilities, etc) (Additional space provided on reverse side)

Reported event root cause (from your point of view, what is the primary reason of such event?)

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