0 INTRODUCTION

0.1 PREFACE

CASS is a quality assurance system used by air carriers. CASS provides air carriers with the information necessary to make decisions and achieve their maintenance program objectives in an organized and systematic way. Furthermore, if CASS is used correctly, it becomes an inherent part of the air carrier's way of doing business and contributes to the company's safety culture.

CASS monitors a variety of programs, the most important being the air carrier's Continuous Airworthiness Maintenance Program (CAMP), which includes inspection. CASS's principal job is to ensure that each airline's CAMP is functional. A functional CAMP prevents premature failures while improving the reliability of aircraft and parts and overall safety.

In an ideal case, the air carrier's CAMP would ensure that there were no events between scheduled aircraft checks. In reality, each CAMP must be continually adjusted to move towards this ideal. An effective CASS should identify elements that are detrimental to the overall effectiveness of the air carrier's CAMP and correct those deficiencies before they become systemic problems.

_____

Accountable Executive

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0.2 TABLE OF CONTENTS

0.3 APPLICABLE REGULATIONS AND STANDARDS

1. GACAR § 121.691 Continuing Analysis and Surveillance.
2. GACA E-Book Vol-4 Chapter-2 Section 5. Evaluate Continuing Analysis and Surveillance (CASS) Program/Revision
3. FAA AC 120-79 (as amended), Developing and Implementing an Operator Continuous Analysis and Surveillance System
4. DOT/FAA/AR-03/70 Continuing Analysis and Surveillance System (CASS) Description and Models.
5. FAA AC No: 120-17B Reliability Program Methods—Standards for Determining Time Limitations

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0.4 MANAGEMENT APPROVAL

Manual Number:	**RXI/OPS-ORG-M03**
Title:	**CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)**
Issue:	00
Revision:	00

Prepared by:		Date:
Title:		
Signature:		

Reviewed by:		Date:
Title:		
Signature:		

Approved by:		Date:
Title:		
Signature:		

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0.5 GACA APPROVAL / ACCEPTANCE

This manual is a controlled document, prepared to meet the requirements of the General Authority of Civil Aviation Regulations (GACAR) and is herewith approved by the General Authority of Civil Aviation (GACA) exclusively for the use of Riyadh Air.

If any conflict exists between the contents of this manual and GACA requirements, GACA requirements shall take precedence, and the manual will be revised without delay in accordance with GACA eBook Vol. 4 Ch.12, section 4.

All contents of this manual are current, as listed in the List of Effective Pages (LEP) Revision 0. 20 DEC 2023.

This manual becomes 'uncontrolled' when printed.

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0.7 RECORD OF REVISIONS

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0.8 REVISION HIGHLIGHTS

This table summarizes the major changes made to each revision, not all changes. Throughout each review cycle, subsequent entries may change, prior entries or proposed changes may be held, disregarded, and/or made obsolete. This is a summary of input received throughout the duration. Changes throughout the manual are indicated by vertical revision bars.

Note: *The vertical bar (change bar) in the margin indicates a change, addition, or deletion in the adjacent text for the current revision of that page only.*

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0.11 ABBREVIATIONS, ACRONYMS AND DEFINITIONS

0.11.1 Abbreviations

CAMP	Continuous Airworthiness Maintenance Program
CAP	Corrective Action Plan
CASS	Continuing Analysis and Surveillance System
CRB	CASS Review Board
DoM	Director of Maintenance
GACA	General Authority of Civil Aviation
GACAR	General Authority of Civil Aviation Regulations
MCC	Maintenance Control Center
MEDA	Maintenance Error Decision Aid
NCR	Non-Conformance form
RCA	Root Cause Analysis
RII	Required Inspection Item
RM	Risk Management
RMP	Risk Management Process
RXI	Riyadh Air

0.11.2 Acronyms

Refer to GACA eBook Vol. 1 Chapter 1 Section 2.

0.11.3 Definitions

Audit:

Scheduled or unscheduled formal reviews and verifications to evaluate compliance with policy, standards, and/or contractual requirements.

Authority:

The power to design or change fundamental policy or procedures without having to seek a higher-level management approval. Authority is a permission; it is a right coupled with an autonomous power to accomplish certain acts or order others to act. Often, one person grants another authority to act as an employer to an employee, a corporation to its officers, or as a governmental empowerment to perform certain functions.

Carried Out by the Operator or Other Person:

The operator must maintain operational control over maintenance that any person performs on its aircraft. Operational control includes independently determining the scope and type of maintenance that may be required, when to accomplish that maintenance, and whether the maintenance was done in accordance with its manual and program, regardless of who accomplished the maintenance.

Corrective Action:

An action designed to eliminate or mitigate a deficiency that has been identified within the operator's maintenance program.

Deficiency:

A condition which is insufficient or incomplete, or where something required is lacking. In a CASS, it is something that is missing from the operator maintenance program that should be there, or it is something that is there but not producing the desired results. Alternatively, it could indicate that the maintenance program documentation is not being followed. For example, a program element that has failed and is not working, or a program element that has faults and is not working as it should.

Effective Producing or capable of producing a desired result. The maintenance program is producing the desired results when the following objectives are realized:

1. Airworthy aircraft that have been properly maintained for operations in air transportation.
2. Competent personnel.
3. Adequate facilities and equipment.
4. All maintenance, preventive maintenance, and alterations are always performed in accordance with the operator's maintenance program and manual.

Establish and Maintain:

To establish means that the operator develops a CASS that is appropriate for the type and scope of its operation. To maintain means that the operator keeps its CASS current and appropriate in response to changes in the type and scope of its operation.

Maintenance Program:

The programs outlined in GACAR § 121.667, other sections of Part 121 subpart J and described in some detail in Federal Aviation Administration (FAA) Advisory Circular (AC) 120-16 (as amended), Air Carrier Maintenance Programs.

Maintenance:

Inspection, overhaul, repair, preservation, and the replacement of parts, excluding preventive maintenance.

Performance:

The act of doing something successfully; the successful execution of an action. In the CASS, performance means that the maintenance program is being accomplished or executed as outlined in the operator manual.

Person:

An individual, firm, partnership, corporation, company, association, joint-stock association, or governmental entity. It includes a trustee, receiver, assignee, or similar representative of any of these.

Preventive Action:

Action to eliminate or mitigate the cause or reduce the effects of potential nonconformity or another undesirable situation.

Program:

An organized list of procedures.

Reliability:

An expression of dependability and the probability that an item, including an aircraft, engine, propeller, or component, will perform its required function under specified conditions without failure, for a specified period.

Responsibility:

The obligation to ensure that a task or function is successfully carried out. Responsibility includes accounting for actions related to the task or function. This is a key attribute of operational control.

Risk:

Risk is the degree of probability that hurt, injury, or loss will occur over a specific period or number of operational cycles. Risk has two elements: severity and likelihood. With regard to operator maintenance operations standards, the relationship between these two elements must be inverse.

Severity:

The type of harm that will be inflicted if a particular event occurs. For operator maintenance programs, severity should be expressed in qualitative terms as a consequence of failure: safety, operational, economic, or environmental.

Likelihood:

The estimated probability or frequency, in quantitative or qualitative terms, of an occurrence related to the hazard; an expression of the probability that a specific unsafe event will occur.

Risk Mitigation:

A risk control measure. It refers to the process of modifying the system to reduce the risk.

Risk Management (RM):

A formal process composed of identifying hazards and analyzing risk, assessing risk, and controlling risk. This process is embedded within the processes used to provide the product/service; it is not a separate process.

Root Cause Analysis (RCA):

The analysis of deficiencies to determine their underlying root cause.

1 CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM

1.1 COMPANY POLICY

RXI recognizes and treats CASS as a coordinated system rather than just audit and data collection activities dispersed within the maintenance program.

CASS monitors a variety of programs, the most important being the air carrier's Continuous Airworthiness Maintenance Program (CAMP), which includes inspection. CASS's principal job is to ensure that each airline's CAMP is functional. A functional CAMP prevents premature failures while improving the reliability of aircraft and parts and overall safety.

A Reliability program is used to satisfy a major portion of CASS.

In simpler terms, a reliability program is a set of procedures and processes that are used to ensure that a product or system is reliable and performs as expected. The CASS documentation refers to the reliability program wherever it is required. The relationship between the CASS and the reliability program is clearly established and addresses responsibility and feedback issues to ensure that the reliability program meets CASS objectives. In other words, the reliability program is an important part of CASS and helps to ensure that the objectives of CASS are met.

As part of CASS, RXI implements an independent Reliability Control Program.

1.2 OVERVIEW OF CASS

CASS functions as a maintenance program management tool that includes continuous and methodical monitoring and evaluation of an operator maintenance program.

CASS uses a continuous, system-safety based, closed-loop cycle of surveillance, data collection and analysis, corrective action, and follow-up to continually evaluate the **performance and effectiveness** of the maintenance program:

1. **A closed-loop cycle** is a process that involves a feedback loop where the output of a system is fed back into the input of the system. This feedback loop helps to ensure that the system is operating as expected and any issues are identified and addressed in a timely manner.

CASS ensures that the right maintenance is being performed at the right time and that it produces the intended results.

The CASS is one of the tools to exercise operational control over maintenance activities conducted on the aircraft.

1.2.1 Maintenance Program Performance

The CASS's program performance (program execution) component makes sure that everyone, including all maintenance providers, complies with the RXI manual, the program, and all applicable laws.

In general, this will be accomplished by implementing a system of audits and investigations into operational occurrences:

1. Every unsuccessful audit and every operational occurrence are regarded as a sign or symptom of a systemic or program failure.
2. Each negative audit and each operational event shall be evaluated by carrying out risk analysis and risk assessment.

Every symptom or indicator may not require corrective action if the risk is within acceptable levels.

The program execution part of CASS includes a continuous cycle of both scheduled and unscheduled (proactive and reactive) surveillance and investigations, data collection and analysis, corrective action, and follow-up surveillance.

1.2.2 Maintenance Program Effectiveness

The CASS's program effectiveness component makes sure that the maintenance program is yielding the desired outcomes. The degree of unscheduled maintenance and the rate of aircraft availability for operation serve as key indicators of the effectiveness of maintenance programs:

1. The program effectiveness part of the CASS functions through a system of various operational data collection and analysis of operational data. Analysis of these operational data and equipment failure data, measures the output (results) of the maintenance program.
2. Data sets such as the rate of aircraft availability, the rate of unscheduled landings, and the rate of schedule and dispatch reliability, etc., are collected in relation to a particular fleet type.

Operational Data Collection and analysis are covered in the Reliability Control Program.

1.2.3 CASS Activities

The CASS enables the detection and correction of discrepancies in all elements of the maintenance program by proactively looking for indicators and symptoms of deficiencies and reactively looking at the results of deficiencies. CASS monitors maintenance program performance and effectiveness through a systems approach using a closed-loop system of four major activities:

1. Surveillance
2. Data Analysis
3. Corrective Action
4. Follow-Up

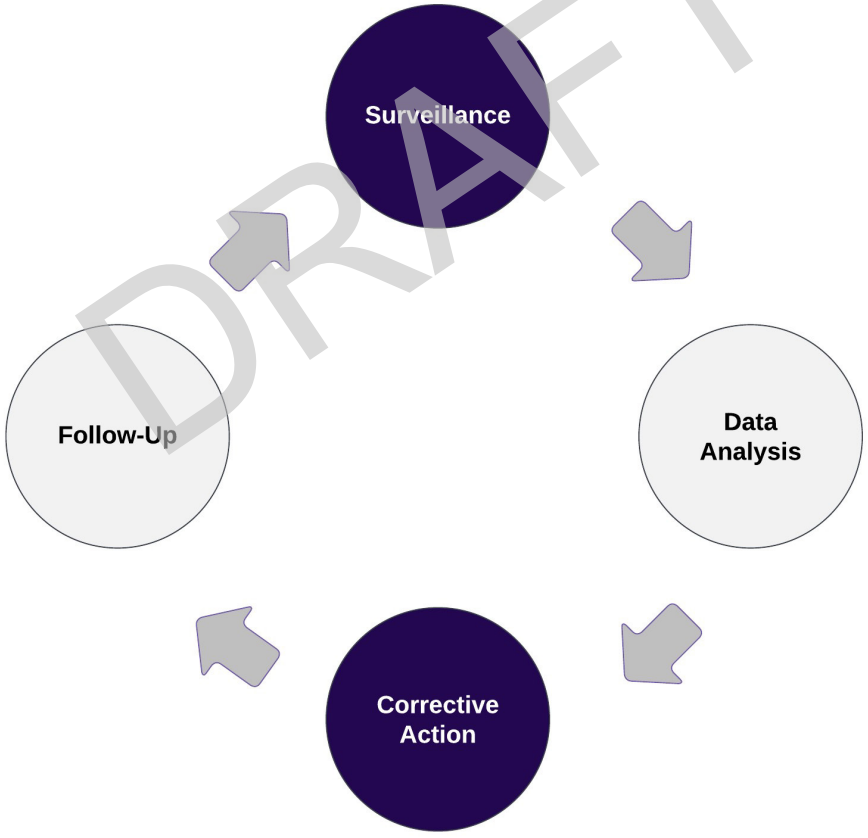

Figure 1 – Closed Loop System

CASS accomplishes surveillance and analysis of the maintenance program from two perspectives: **Performance** and **Effectiveness**.

Surveillance and analysis are conducted in two different ways.

1. Performance: The primary basis is surveillance audits and analysis.
2. Effectiveness: The primary basis is operational data collection and analysis.

The results of analysis feed into the third and fourth basic CASS activities i.e., corrective action and follow-up.

The following table (Table 1) summarizes the flow of both the primary activities:

Verify Performance of the Maintenance Program		Verify Effectiveness of the Maintenance Program	
1	Surveillance-Audit Process	1	Surveillance: Data Collection Process
• Create a Risk-Based Audit Plan: • Perform work-in-progress audits. • Perform transaction audits. • Perform system audits. • Identify hazards. ⇩		• Select data sets. • Collect operational data. • Collect failure data. • Identify trends, anomalies, and potential hazards. ⇩	
2	Analysis	2	Analysis
Identify hazards, accomplish Risk Analysis and Assessment. ⇩		Identify hazards, investigate adverse indicators, and accomplish Risk Analysis and Assessment. ⇩	
3	**Corrective Action**		
Accomplish a Root Cause Analysis (RCA); develop, implement, and monitor a Corrective Action Plan (CAP), as appropriate. ⇩			
4	**Follow-Up**		
Verify that the corrective action was effective, and initiate risk-based follow-up. Surveillance planning, as appropriate.			

Table 1 — The Maintenance Program Effectiveness and Performance Verification

1. **Surveillance**: Data are collected for use in the evaluation of all elements of the maintenance program (including maintenance providers) from two different perspectives: Performance and Effectiveness.

    a. **Surveillance to Verify Performance** involves the use of audits, specifically work-in progress audits used to make sure the manual and program are being followed.

    b. **Surveillance to Verify Effectiveness** involves the collection of operational data and aircraft systems failure data so that the analyst can make conclusions about the degree of effectiveness of the maintenance program.

2. **Analysis of Data**: Data Analysis is the identification of system deficiencies (hazards) in the maintenance program through analysis of the various kinds of data that has chosen to collect. Data analysis is also used to verify an acceptable level of program performance or effectiveness.

    a. **Performance (Program Execution).** The Analysis Function of the CASS is carried out through the analysis of data collected during the accomplishment of audits and investigations. These audits and investigations examine the actual accomplishment of the activities and tasks of a maintenance program element relative to the standard (i.e., The Operator Manual and The Maintenance Program). The accomplishment of audits and analysis of audit data serve to measure program execution.

    b. **Effectiveness (Intended Results Produced).** The Analysis Function of the CASS is carried out through the analysis of collected operational data. Collection and analysis of operational data allows us to measure the output of the maintenance program relative to its objectives.

3. **Corrective Action**.: CASS identifies deficiencies through analysis of the audit and operational data that it collects. However, based on the risk assessment performed during risk analysis, not all deficiencies will require corrective action. The level of risk might be of an acceptable level if safety is not compromised.

    a. When a risk is at an unacceptable level (Refer Section 4.2.2.3), risk controls (corrective action) will be employed to deal with an identified deficiency and the cause(s) of that deficiency with a comprehensive fix to ensure that the problem does not recur in the future.

    b. When a corrective action plan (CAP) is developed, it shall address the causal factor(s), and provide a solution to prevent recurrence. Root Cause Analysis (RCA) is used to identify the central causes of an event to facilitate effective corrective actions. A CASS shall implement and monitor the corrective action plan through to completion.

Follow-Up. Follow-Up is the very important function that ensures the corrective action has addressed the deficiency. Follow-Up ensures that the corrective action is effective and connects the closed loop back to surveillance. Based on the assessment of risk after implementing the corrective action plan, additional surveillance shall be conducted and/or data collection processes shall be modified.

2 CASS ORGANIZATION

2.1 CASS ORGANIZATION STRUCTURE

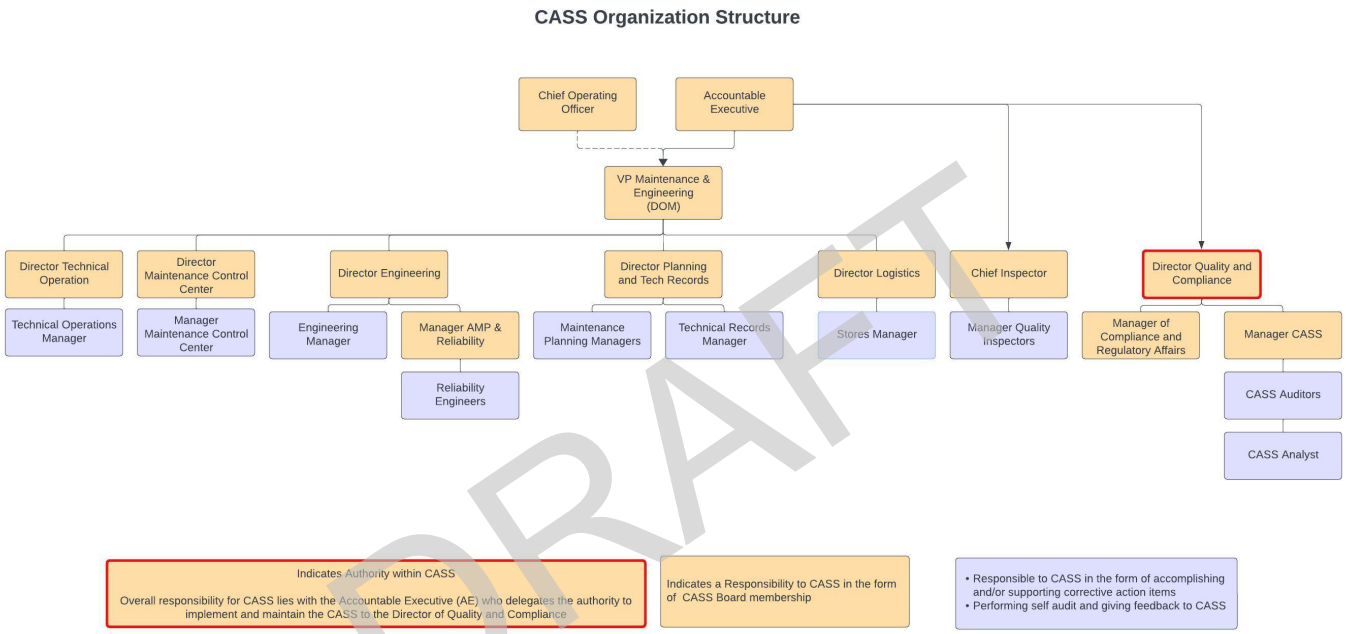

Figure 2– CASS Organization Structure

2.1.1 Authority and Responsibility Within CASS

2.1.1.1 Authority Within CASS

Authority is the permission and is the power to create or modify fundamental policy or procedures without higher level review or approval.

Authority also means the power to accomplish a function, as well as the power to assign responsibility for carrying out the various functions of the maintenance program.

Authority for the CASS may design or change the CASS to improve its efficiency or responsiveness.

Authority might also have responsibility for other functions as well as the CASS.

Overall responsibility for CASS lies with the Accountable Executive who delegates the authority to implement and maintain the CASS to the Director of Quality and Compliance.

2.1.1.2 Responsibility Within CASS

Responsibility is an obligation that comes with accountability to ensure the successful completion of tasks and functions in accordance with applicable policies, procedures, and standards:

1. The individual with responsibility for the CASS has the obligation to carry out the functions of the CASS, including overseeing and managing any personnel who are assigned CASS functions and duties.
2. The individual with responsibility might also have responsibility for other functions as well as the CASS.

Refer to Figure 3, which identifies all CASS review board members in responsibility roles.

2.2 CASS REVIEW BOARD (CRB)

2.2.1 CASS Board Members

2.2.1.1 Decision-making Group

The Decision-making group is a relatively high organizational level to oversee or carry out CASS functions. The group has an appropriate technical background, thoroughly familiar with the role and functioning of CASS, systems analysis, plus sufficient knowledge to evaluate the RCA and proposed corrective actions submitted for their review. This oversight group includes:

1. Director Quality and Compliance (Authority).
2. Manager CASS (Deputy Authority).
3. Director Maintenance Control Center.
4. Director Engineering.
5. Director Maintenance Control Center.
6. Director Technical Operations.
7. Chief Inspector CASS.
8. Director Planning & Technical Records.

2.2.1.2 Support Group

The CRB's support group members act as counsel to Decision-making group members in their respective areas of responsibility and provide them with the following guidelines:

1. Presenting constructive feedback and input.
2. Having a thorough understanding of everyday activities in their areas of responsibility.
3. Providing views from multiple perspectives:
    a. Assisting in the evaluation of the effectiveness of Corrective Actions.
    b. Providing additional thoughts in the event of repeated or persistent issues.

Support group members shall be invited for the CRB Meeting depending on the agenda points to be discussed.

2.2.1.3 Optional Members

The Chief Pilot and the VP Corporate Safety, Security & Environment shall be invited to the CRB meeting depending on meeting agenda.

2.3 CRB MEETINGS

The CRB meetings are held every month to discuss CASS issues:

1. The Manager CASS prepares the CASS Report for Distribution.
2. The Manager CASS provides a week's advance notification to all CRB members detailing the meeting's date, time, location, agenda, and CASS report for discussion.
3. Before the CRB meeting, the CRB members are required to read and review the CASS report.
4. In the absence of permanent members, a person familiar with the CASS program shall be delegated by the permanent member.
5. Also, Manager CASS should encourage participants to develop a list of additional topics for discussion.
6. The CRB Meeting is held monthly and the CASS Manager is responsible for compiling the CASS Report (with the inputs of various departments).

2.3.1 CRB Emergency Meetings

Director Quality and Compliance has the authority to call for an urgent meeting of the CRB on following situations (BUT NOT LIMITED TO):

1. Serious Airworthiness Concern.
2. Failure of Aircraft vital points.
3. Reliability Critical findings/issues.
4. Critical failure/lapses in the process or procedures.
5. Failure

2.3.2 Meeting Agendas

Review and acceptance of previous meeting minutes:

1. The Manager CASS presents the CASS report (Refer Section 5.2.6) for discussion.
2. Status of open cases requiring CRB clearance, and if necessary, previous CASS investigation cases.
3. Review of audit findings, surveillance findings, and deficiency corrections as required.
4. Review of Effectiveness Critical Items.
5. Review of Performance Critical items.
6. Review of RCA outcomes and corrective actions.
7. Discussion about reliability issues.
8. Review of audit plan.

9. Meeting minutes/CASS Report to be sent to all CRB members.

2.3.3 Discussions

The CASS Review Board meetings provide an environment for open debate of agenda items. Members have the ability to share their thoughts; nevertheless, it is an obligation of each member to be brief and to the point. If the matter necessitates significant debate, a special meeting can be held, with the outcome documented and disseminated as needed.

2.3.4 Assignments

An individual CASS Review Board member might occasionally be tasked with conducting additional research, finding a solution, or taking corrective action. These people are required to complete the assignments, record the findings, and submit them to Manager CASS for discussion at the subsequent CASS Review Board meeting.

2.3.5 CRB Decision Making Guidelines

The following are the primary guidelines used in the CASS Review Board decision-making process to analyze the impact of modifications to the CASS and affect the course of action regarding the proposed changes. The CASS Review Board is expected to adhere to the following criteria while exercising good judgement and common sense.

1. The decision must not violate any GACA Regulations:
    a. Ensure that there is no impact on the airworthiness or system safety standards already in place elsewhere.
    b. Decision should not introduce any new hazard.
    c. Decision shall not have an adverse effect on the safety culture and attitudes of those involved.
    d. Decision shall include enough controls to ensure that the decision can be followed.
    e. In cases when a decision creates a dangerous situation, take steps to make the dangers less severe .

2.4 DUTIES AND RESPONSIBILITIES

2.4.1 Director of Quality & Compliance

1. Plays the authority role within CASS.
2. Responsible for the implementation, monitoring, and reviewing of the CASS in accordance with all company policies and procedures.

2.4.2 Manager CASS

1. Verify that all appropriate data are collected for surveillance activities.
2. Verify that appropriate follow-up is conducted for corrective actions.
3. Distribute audit results, action items, corrective actions, and action item closures to board members.
4. Approve an audit schedule and surveillance plan.
5. Approve Audit Checklist.
6. Facilitate CASS Board Meetings.
7. Prepare CASS agenda and report for discussion.
8. Prepare Minutes of the meeting and circulate to all members.

2.4.3 CASS Auditors

1. Evaluate facilities, equipment, and processes.
2. Prepare auditing schedule.
3. Prepare Audit Checklist.
4. Analyze performance data.
5. Conduct various audits (Scheduled Audit, Surveillance Audit, 3rd Party Audit etc.).

2.4.3.1 Auditor Qualifications

1. Qualifications as described in CAAS Auditors - Job Description and Responsibilities (Form RXI/OPS-QMS-00X) including the following:
    a. Relevant aviation experience in areas such as maintenance, engineering, safety management, quality assurance, or regulatory oversight.
    b. Sufficient maintenance background applicable to maintenance program.
    c. Have completed an approved auditor training course that covers the principles and practices of auditing, understanding, and interpreting data.

d. Ability to plan, conduct, report, and follow up on audits in accordance with the CASS audit methodology and criteria.

e. Systems analysis.

f. Familiar with Auditing techniques.

g. Understanding Risk assessment and risk management (RM) process.

h. Familiar with Various RCA processes.

i. Knowledge of Human factors.

2.4.4 CASS Analyst

1. Qualifications as described in CAAS Auditors - Job Description and Responsibilities (Form RXI/OPS-QMS-00Y) including the following:

   a. Collects, analyzes, and reports data on the following aspects of aviation safety:

      i. Aircraft defects;

      ii. Incidents;

      iii. Accidents;

      iv. Audits;

      v. Inspections.

   b. Identifies trends, issues, and risks in order to enhance aviation safety and compliance.

   c. Conducts Root Cause Analysis.

   d. Analyzes Human Factor issues.

   e. Prepares and delivers various reports for Internal and External stakeholders.

   f. Proficient in using various tools and software used for analysis.

Note *A reliability department collects and analyzes operation performance data, reports directly to CASS Review Board (CRB), and prepares and delivers various reports for Internal and External stakeholders. Refer to Reliability Control Program Manual for the process and reports.*

2.4.5 Role of Outside Auditors

Regulations permit air carriers to use individuals outside the company to conduct CASS audits.

If the situation warrants, RXI will use outside entities to conduct audits which are specific to the needs of the Company.

RXI ensures the following whenever outside entities are engaged:

1. Auditors are appropriately trained.
2. Auditors possess the same competency as RXI internal auditors.
3. The same procedures and checklists are used as with RXI's own auditors.
4. The results of the outside auditor's surveillance are evaluated by an internal team.
5. There shall be no distinction between findings made by a company auditor and those made by an outside auditor. All auditor findings will be treated with the same degree of importance.

3 CASS FUNCTIONAL DIAGRAM

3.1 GENERAL

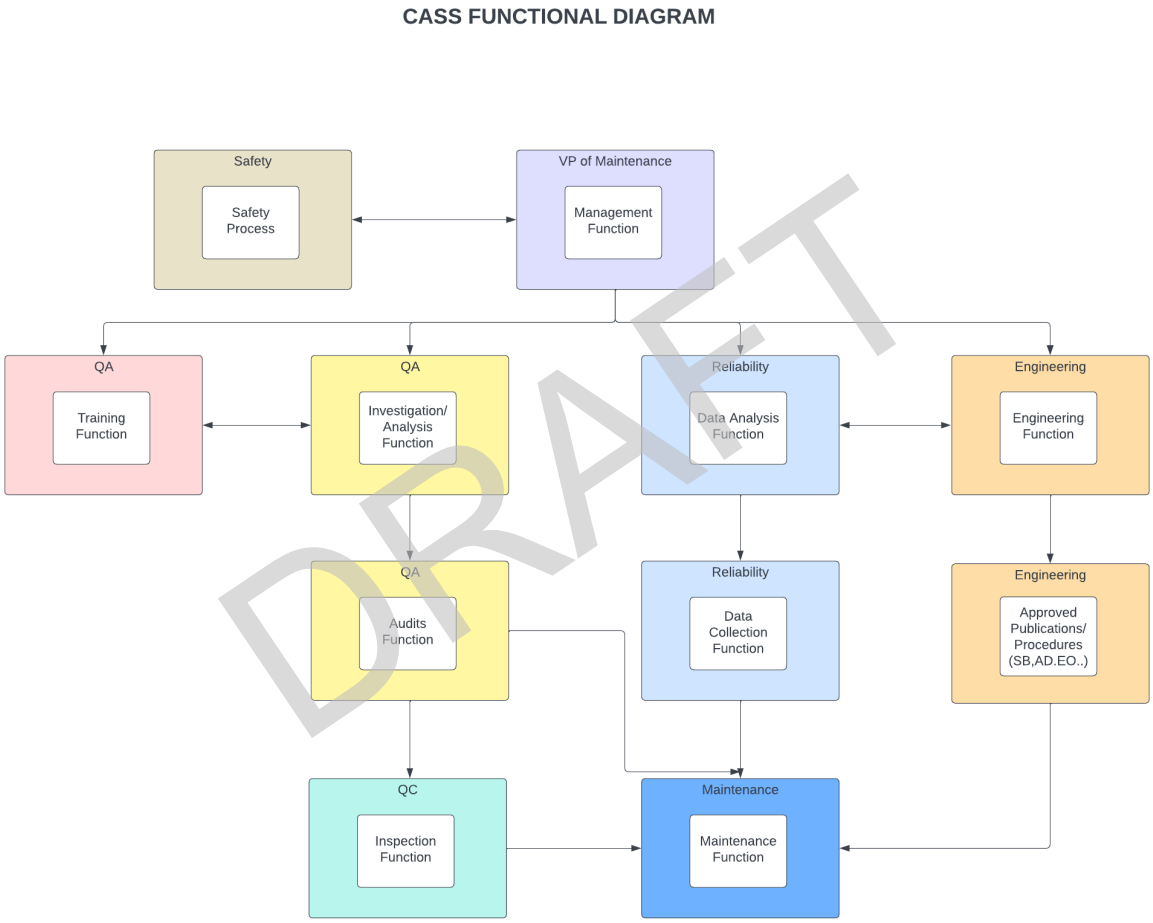

Figure 3 – CASS Functional Diagram

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4 PROCEDURES FOR CASS

4.1 CASS SURVEILLANCE

CASS Surveillance includes the following processes.

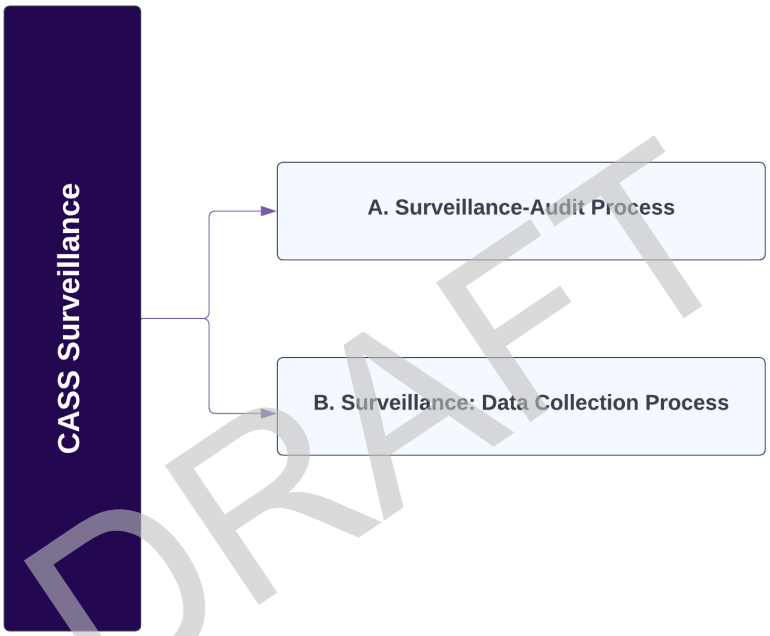

Figure 4 — CASS Surveillance Process

4.1.1 A. Surveillance-Audit Process

4.1.1.1 Introduction

The audit is the primary method for determining whether RXI is carrying out the maintenance and inspection programs correctly .

An audit is a formal assessment of the work processes of a department, or section within a department, of maintenance and/or inspection programs in accordance with an established standard, such as an applicable manual or audit checklist. These audits are intended to ensure that maintenance and inspection staff, as well as outside maintenance providers, are adhering to RXI manuals, programs, and other requirements.

4.1.1.2 Types of Audits

Internal – Audits that the Quality Compliance Department performs within the Company and in-house department self-audits performed by responsible managers.

External – Audits that the RXI Quality Compliance Department performs on maintenance providers that perform maintenance on RXI aircraft, engines, components, and/or supply parts and services to the company.

Surveillance – is done on a proactive basis and represents a constant monitoring of RXI procedures and standards.

Scheduled Audits – Continual monitoring of RXI policies and practices is done through proactive surveillance.

Unscheduled Audits – Reactive surveillance that arises from a specific series of events, such as incidents or in-service failures that point to a negative trend.

Third Party Audits – Surveillance that is performed by the Regulator or any certifying body, or by a customer who contracts RXI services.

4.1.1.3 CASS Audit Objectives

Audits shall be proactive in nature, seeking out possible issue areas before they cause negative consequences.

Audits shall be performed on a regular basis by authorized designated individuals. The designated individual is under the control and guidance of the Quality & Compliance Department when acting as an auditor.

4.1.1.4 Scheduled Audit – Audit Scheduling

Periodically, functional areas of aircraft maintenance will be evaluated. These audits may be scheduled ahead of time as per the pre-planned audit schedule or performed without prior notification to the department (special audit).

The functional areas include, but are not limited to, program compliance which covers all ten elements of the Continuous Airworthiness program and shall cover contract Line Maintenance Stations supported by Maintenance providers.

The ten elements of the Continuous Airworthiness Maintenance Program:

1. Airworthiness Responsibility.
2. Maintenance Manuals.
3. Maintenance Organization.
4. Maintenance Schedule.
5. RIIs.
6. Contract Maintenance.
7. Personnel Training.

8. Accomplishment and Approval of Maintenance.
9. Maintenance Recordkeeping System.
10. CASS.

Based on the scheduling and operational demands, the Manager-CASS shall create a yearly audit plan (Refer Section 5.2.1). Internal audits should not be performed more than one calendar month after their planned intervals.

The planned audit schedule shall be circulated in advance to all the departments/sections covered in the audit schedule.

Although scheduled audits will follow a defined periodic review cycle, scheduling will be flexible to allow for special evaluations in reaction to negative trends or in anticipation of future concerns. These audit cycles are altered based on risk assessments, which may cause the interval to be increased or decreased.

For example, if discrepancies/findings from a particular department are high in number, this may indicate an adverse trend and require more frequent audits compared to a department with few discrepancies.

External audits of contract maintenance providers may be undertaken after their planned due date, provided that the provider is placed in the non-use category until an audit is performed and approved by the Director of Quality & Compliance.

Manager-CASS shall maintain a list that shows when the last audit was accomplished and when it is next due.

4.1.1.5 Unscheduled Audits

Unscheduled audits are carried out in response to an event or a series of events.

Events such as rejected take-offs, unscheduled landings, in-flight shutdowns, accidents, or incidents may indicate the need for special audits or surveillance under a CASS.

As part of the reactive function, auditors must investigate the event. At the same time, the CASS auditor must assess whether the event indicates a need to focus audits on a certain area using a proactive approach.

4.1.1.6 Areas of Audit

Surveillance areas include, but should not be limited to, the following items:

1. All manuals, publications, and forms. These must be useable, current, accurate, and readily available to their users.
2. All maintenance and alterations must be performed in accordance with the methods, standards, and techniques specified in the RXI manuals.
3. Maintenance records must be generated in accordance with the RXI manual procedures and must be adequate, correct, and complete.

4. Required Inspection Items (RII)s must be clearly identified and handled in accordance with the RXI RII procedures.
5. Airworthiness releases must be executed by authorized persons and accomplished in accordance with the procedures specified in RXI's manuals.
6. Shift turnover records and deferred maintenance must be handled in accordance with RXI's manual procedures. Auditors should consider focusing on shift turnover errors as part of their surveillance system.
7. Process/procedure followed by MCC.
8. All maintenance facilities and equipment, including contract maintenance facilities and equipment. These should be adequate for the work to be performed.
9. All parts and components, including contract maintenance providers, are handled, stored, dispensed, and identified correctly.
10. ADs are appropriately evaluated, actioned, accomplished, and tracked.
11. All personnel, including contract personnel, must be competent to properly execute the maintenance that is to be performed and must comply with RXI's procedures for recording maintenance.
12. Each aircraft released into service is airworthy and properly maintained for service in air transportation.
13. Tools and equipment are properly calibrated.
14. Training records of all personnel involved, including contract maintenance providers and subcontractors.
15. Availability of special tools and their training requirements

Computer programs used to track the Aircraft Maintenance Program and the Maintenance Inspection Program are used in accordance with the specifications; backups process is used to preserve the data from corruption and system of security procedures are followed to limit access.

4.1.1.7 Department Self-Audits

All departments shall conduct regular self-audits to ensure compliance with the applicable regulations and standards.

The self-audits cover various aspects of the department's operations, such as safety, security, quality, performance, and customer satisfaction.

The self-audits are performed by Managers or supervisors of each functional area who follow a systematic and objective approach.

The outcomes of the self-audits are documented, and responsible managers must discuss them at CRB meetings to determine whether any process changes, additional staff training, or other improvement activities are necessary.

The self-audits help the department to identify and correct any deficiencies, risks, or opportunities for enhancement.

4.1.1.8 Audit Checklist

Preparation of audit checklists (Refer Section 5.2.2) involves reviewing company manuals and documents. Audit points shall verify the auditee's performance in their respective area of activity.

Checklists shall be intelligently prepared to enable the auditor to assess the degree of compliance with the documented system. This can only be done if the questions demand an auditee response that contains the information as expected by the auditor.

1. All questions included in the checklists shall be objective in nature.
2. Checklists should be detailed.
3. One of the most important aspects is that the questions shall reflect the applicable part or paragraph cross-references of specific regulations or Company manuals.
4. Audit check shall include a place to record sample references used during the audit process.
5. Audit checklist shall be prepared by auditors and approved by Manager CASS.

4.1.1.9 Audit Method or Process

The auditor shall use the appropriate checklist for each type of audit being conducted. In addition to the checklist, the auditor utilizes the following techniques during the audit process:

1. Interviewing employees.
2. Reviewing documents/procedures.
3. Observation and monitoring of maintenance activities as well as contracted maintenance providers.
4. Sampling audit of processes or procedures.
5. Review of the previous audit's findings and status of the effectiveness of the corrective action taken.

Nonroutine items completed during the check should be carefully reviewed because they were not included in the original planned check and may show weaknesses in the CAMP.

Auditors should maintain informal lines of communication with other department staff members so that they can communicate any concerns they may have. Auditors can learn about potential system hazards through this informal communication. Risks that may result in an event but are otherwise difficult or impossible to discover in routine audits can be detected using this strategy.

Following the completion of the audit, the auditor will debrief the appropriate department personnel. The goal of the debrief is to communicate the audit results before creating the Corrective Action Reports (CARs). The debrief shall include the following points.

1. Highlight good findings; be sure to offer credit where credit is due, especially when requirements and/or procedures have proven to be effective.
2. Discuss any non-conformances (discrepancies) found during the audit.
3. Discuss the auditor's observations during the audit that do not constitute findings but may require further improvement.
4. Highlight that it is the auditee's responsibility to determine the scope of corrective and preventive action.
5. Thank the auditee for their time and courtesy. Formally and courteously bring the audit to a close.
6. Prepare Audit Report (Refer Section 5.2.3).

4.1.1.10 Non-Conformance form (NCR)

1. A report as per Non-Conformance form (NCR) (Refer Section 5.2.4) shall be generated for each finding by the auditor.
2. The auditor shall create an audit report (Refer Section 5.2.3) to record the results as satisfactory, no shortcomings, improvement necessary, or the need for corrective and/or preventive actions to address identified issues of concern. If the audit is conducted by a team of auditors, then the audit team leader shall create a report.
3. The report prepared by the auditor shall be submitted to Manager CASS. The report shall include the checklist used during the audit, area of audit, date of audit, auditee name and designation, copy of evidence, and findings (if any).
4. Manager CASS shall review the report and submit it to Director of Quality and Compliance for their review and approval.
5. Manager CASS shall maintain a file comprising the complete audit report, including subsequent communications.

4.1.2 Surveillance of the Effectiveness of the Maintenance Program

The gathering of operational data (data arising from airplane operations) is the primary tool for measuring the effectiveness of the air carrier's maintenance program. In this manner, the maintenance program's results can be evaluated. However, not all operational information or data may be helpful for assessing the efficacy of a maintenance program.

Refer Reliability Control Program Manual

4.2 CASS ANALYSIS

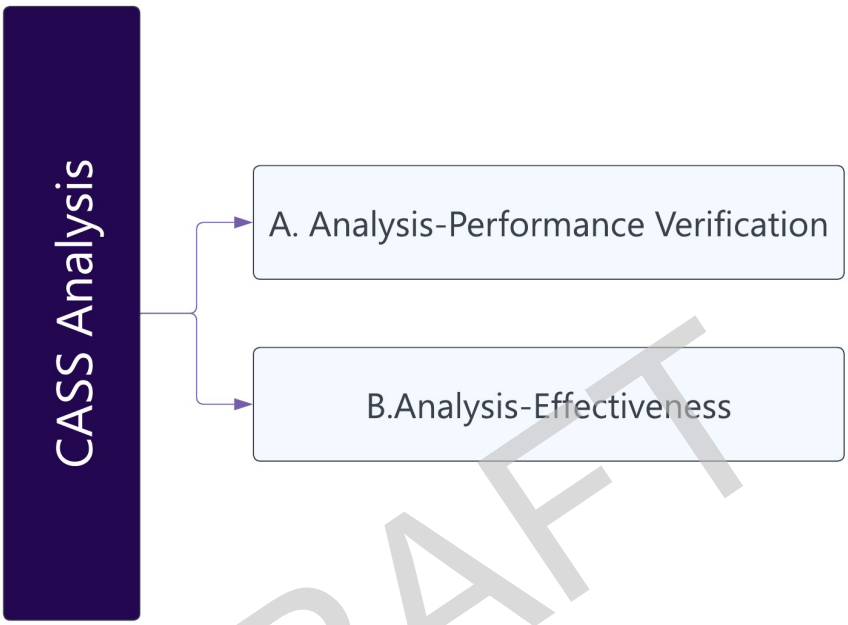

Figure 5 – CASS Analysis

4.2.1 Analysis Flow Chart

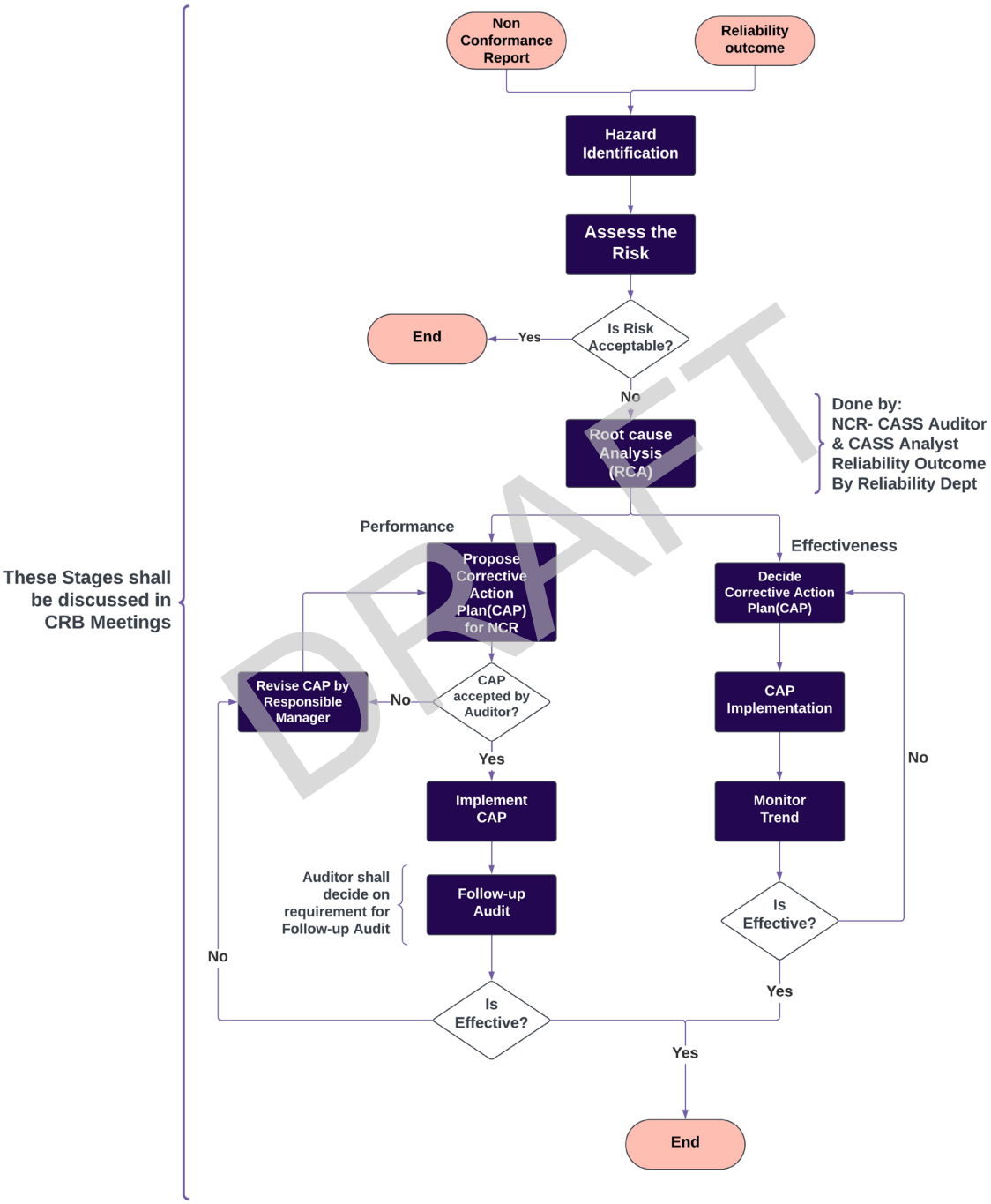

Figure 6 – CASS Analysis Flow Chart

4.2.2 Analysis-Performance Verification

It is not sufficient to simply identify a problem through surveillance. Once a problem becomes known, it shall be evaluated through various types of analysis, including:

1. Risk analysis,
2. Root cause analysis, and
3. Human Factors investigations.

It is the responsibility of the auditor and CASS analyst to carry out the analysis in coordination with the process owner/responsible manager.

4.2.2.1 Risk Analysis or Risk Management (RM)

RM facilitates the balancing act between assessed risks and practical risk mitigation.

RM serves to focus safety efforts on those hazards posing the greatest risks. Essentially, any methodology used to prioritize surveillance personnel and resources involves principles of RM.

The following elements compose a formal Risk Management Process (RMP):

1. Identifying hazards.
2. Analyzing risk.
3. Assessing risk.
4. Controlling risk.

Figure 7 – Risk Analysis Steps flow chart, gives an overview of the RMP.

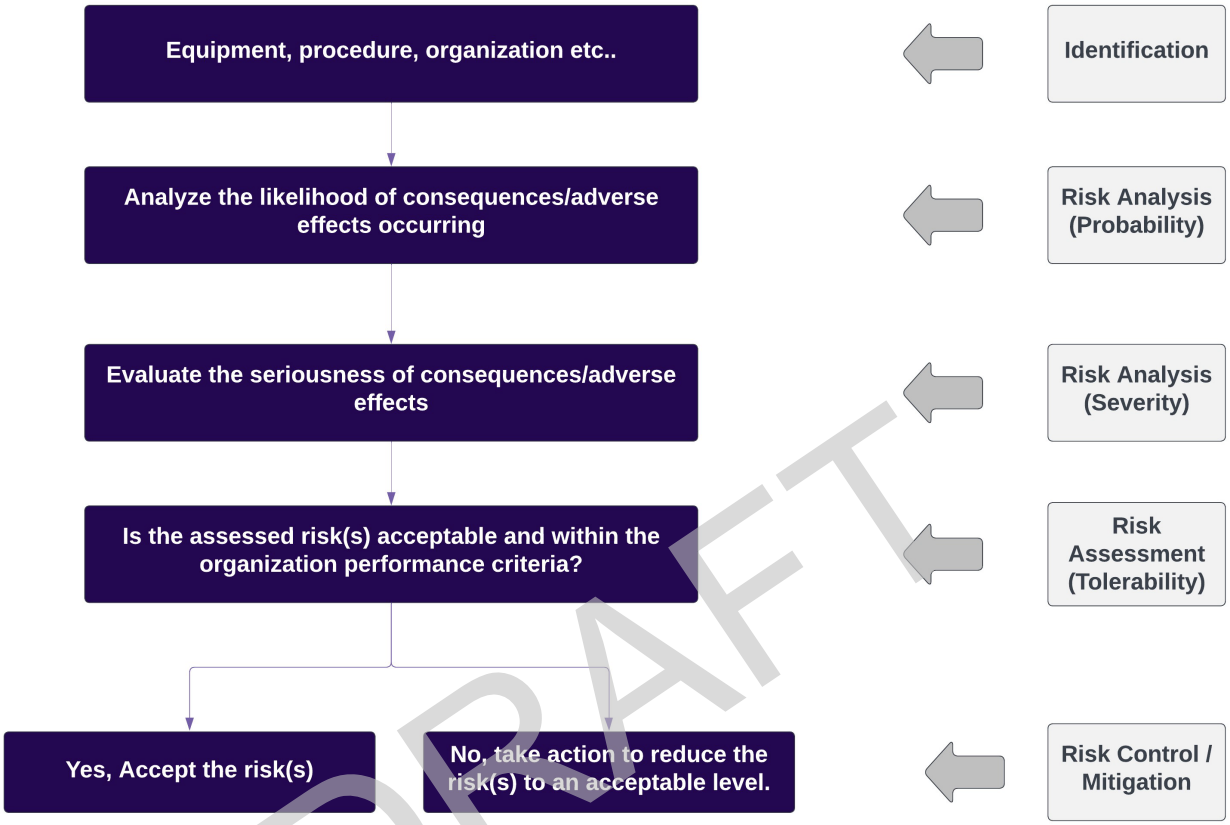

Figure 7 – Risk Analysis Steps

4.2.2.2 Identifying Hazards

Hazards can be identified by evaluating incident history, audit findings, reliability outcomes and studies, and convening a panel of experts (like Responsible Mangers) to discuss possible hazards.

When looking for hazards consider every aspect of the line of work. Consider any situations or job activities that could endanger employees, property (for example, unprotected machinery or a wet floor). Inquire with employees if they have any unique concerns.

4.2.2.3 Assess the Risks

Once the hazard is identified, assess the risks it poses. When examining a hazard, there are two basic issues to consider: **how likely is an incident, and how serious would it be if it occurred?** A risk assessment can assist in prioritizing the threats so that which ones to address first.

Assess the risk of each identified hazard. The process shown below is a representative sample of how a risk analysis works. In this process, assessing the risk can be accomplished using the following steps:

1. Identify existing defenses.
2. Rate the effectiveness of existing defenses.
3. Describe the worst-case scenario.

Rate the consequences of each scenario. Consequences can be rated as follows:

1. Insignificant
2. Minor
3. Moderate
4. Major
5. Catastrophic

Rate the likelihood of the consequence of each scenario. Likelihoods can be rated as follows:

1. Rare
2. Unlikely
3. Possible
4. Likely
5. Almost certain

Based on consequence and likelihood ratings, assign a risk level to each hazard.

Once this analysis has been accomplished, risks can be treated using the decision matrix shown in Table 2 – Risk Decision Matrix and Table 3 – Risk Level, Evaluation and Response below:

Risk	Consequences (Severity)				
Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain					
Likely					
Possible					
Unlikely					
Rare					

Table 2– Risk Decision Matrix

4.2.2.4 Key

Color	Risk Level	Evaluation	Response
	Extreme	Intolerable	Urgent action required
	High	Must consider measures to reduce risk	Improvement required in the short term
	Moderate	Must consider measures to reduce risk	Assess and monitor regularly
	Low	Tolerable	Assign a low-risk priority

Table 3– Risk Level, Evaluation and Response

4.2.2.5 Analyze the Risk

4.2.2.5.1 Root Cause Analysis (RCA)

A CASS should reflect overall management philosophy and it should avoid or discourage a "blame culture" within maintenance organization. A blame culture:

1. fixes blame and moves on,
2. focuses on who made the error and their punishment,
3. encourages you to stop short of identifying:
4. systemic problems, or
5. root causes,
6. never permits you to fix the problem, and
7. allows mishaps and mistakes to recur.

RCA treats the underlying causes of a problem instead of the surface-level symptoms of the problem itself.

The basic principle of Root Cause Analysis is, to put it simply, that an auditor must keep looking into a finding until they find a starting component that can be modified to reduce the likelihood that it will lead to future safety issues.

The process starts during the audit itself, and auditors must collect information conducive to later analysis. For example, if a CASS is to uncover a procedural weakness, then the information about the procedure must be collected.

Each root cause finding made after an audit should be taken into consideration for action and addressed in the audit report.

There are many methods available to conduct RCA. While it is not a requirement to implement any specific externally developed system, analytical tools, or processes to assist in the analysis process, as a guide a few methods are listed in Appendix-A

The auditor along with the analyst shall complete the RCA and fill the part-2 of Form No: MNT-CASS-F04.

4.2.3 Analysis-Effectiveness

The main tool for assessing whether the maintenance program is effective is the collection of operational data (data resulting from airplane operations). This way the output of the maintenance program can be measured. However, not all operational data or information may be useful for determining maintenance program effectiveness.

The main aim of maintenance programs is to always provide airworthy aircraft, as well as to provide the maximum level of availability.

In simple terms, the amount of unscheduled maintenance that reduces the availability of an aircraft for operations is a primary indicator of whether the maintenance program is producing its intended results.

***Note**: Refer to the Reliability Control Program for various processes followed to analyze the effectiveness of the maintenance program.*

4.3 CONTROL OF RISKS – CORRECTIVE ACTION PLAN (CAP)

Based on the risk assessment and analysis, **the process owner/responsible manager** should determine appropriate actions and select actions based on a preference order, which is:

1. Elimination
2. Substitution
3. Engineering controls
4. Administrative controls
5. Personal protective equipment (PPE)

Based on NCR and subsequent analysis, the process owner/responsible manager shall prepare the Corrective Action Plan (CAP) Part-1 of Refer Section 5.2.5 and submit to the auditor for their approval (applicable for only NCR-Non-Conformance Report).

The process owner/responsible manager is responsible for the investigation, evaluation of, and development of responses to the audit findings to prevent a recurrence.

CAP related to reliability outcome shall be forwarded to the appropriate department by Manager CASS or shall be discussed in CRB to determine a further course of action.

If the auditor rejects the CAP, the Manager CASS must begin a new CAP.

Director Quality and Compliance reviews and approves the resulting Corrective Action Plans.

Manager CASS is responsible for the approval of responses to the CAPs as well as ensuring their proper implementation.

To achieve effective communication, all CAPs shall be discussed in the CRB meetings. This will help in identifying the findings that may affect more than just the area where an audit revealed a problem.

To include all affected parties in the corrective action development process, the CASS Authority shall form a corrective action team.

***Note**: Under no circumstances should CASS audits result in the transfer of the responsibility to achieve the desired outcomes from the operating organization to the auditing organization.*

4.3.1 CAP Actions

1. Elimination

   Whenever feasible, eliminate the hazard so there's no risk of injury/loss of property. Ask the following:

   a. Is the task necessary to begin with?

   b. Can the hazardous part of the task be removed?

   c. Can the task be done in such a way that it is not exposed to the hazard?

2. Substitution

   If you can't eliminate the hazard, substitute a safer material or process. Ask the following:

   a. Can a different machine or tool be used?

   b. Can a less hazardous material or chemical be used?

   c. Will alternative practices reduce exposure to the hazard?

3. Engineering Controls

   Engineering controls are physical changes to the way tasks are done. Examples include re-designing workstations or modifying equipment to make it safer or more ergonomic.

4. Administrative Controls

   Administrative controls are changes to the way work is organized and performed. This can include planning, organizing, and scheduling resources, training, and staffing. Safe work practices and procedures are an important form of administrative control.

5. Personal Protective Equipment (PPE)

   PPE provides protection against hazards. It should be used when other safety controls are not practical, or in addition to other controls. For example, to help prevent slips, trips, and falls, make sure your workers wear slip-resistant footwear.

4.4 FOLLOW-UP

Once corrective actions have been developed and implemented for audit findings or reliability outcomes, the CRB should follow up on the corrective actions to the findings, thus ensuring that the comprehensive fixes have been accomplished and are effective. This can close the loop between the initial finding and the development and implementation of corrective actions.

All open CAPs shall be discussed and monitored by CRB till all CAPs closed.

4.5 HUMAN FACTORS ANALYSIS

1. Human Factors Analysis involves studying human behavior, awareness, communication, and capabilities in different work contexts and applying that knowledge to design solutions that enhance human performance, safety, and satisfaction.
2. By anticipating that human error is unavoidable, systems can be designed to enhance safety and optimize human input. This way, the systems can support the human operators in performing their tasks effectively and efficiently, while minimizing the risks of errors and accidents.
3. Human factors include basic issues that can be addressed in audit checklists, such as whether there is adequate lighting for mechanics and inspectors to perform their work, and whether schedules permit personnel to be properly rested.
4. Knowledge gained from Human Factors Analysis can help avoid maintenance errors.
5. Human Factors Analysis is a valuable tool for improving maintenance performance, reducing errors, and matching personnel skills to task demands. It also helps to maintain and enhance the skills of the staff, and to create a better work environment. CASS analysts can use this knowledge to conduct RCA more effectively and efficiently.
6. One possible cause of maintenance errors is inadequate training of mechanics and inspectors, who may not have enough knowledge of Human factors issues. For example, a mechanic or technician who appears to lack the appropriate skills for the work and finds that greater technical training is the solution. However, a deeper analysis may show that there are other factors that contribute to the error, such as equipment design, job cards, manuals, the work environment, or organizational procedures like shift turnover. In some cases, a different type of training, such as decision-making skills, may be more appropriate.

CASS surveillance must also ensure that RCA includes human elements while investigating specific events. Otherwise, the data evaluated in a CASS may be insufficient.

4.5.1 Maintenance Error Decision Aid

1. The Maintenance Error Decision Aid (MEDA) tool was developed by the Boeing Human Factors Engineering group for analyzing human performance issues related to maintenance errors and trends.
2. MEDA shall be used to track events, investigate, and prevent maintenance errors, identify contributing factors, corrective actions, and prevention strategies.
3. Maintenance Error Decision Aid (MEDA) Results Form shall be used to investigate events caused by Maintenance Errors.
4. Maintenance Error Decision Aid (MEDA) Results Form (Refer Section 5.2.7) shall be part of the investigation process and shall be preserved.

4.6 CASS RECORDS

1. CASS documents and records shall be preserved indefinitely.
    a. The current and past CASS Reports.
    b. A working copy of the Audit Checklist.
    c. Non-Conformance Report (NCR).
    d. Corrective Action Plan (CAP) Forms.
    e. All Reliability analysis reports.
    f. Follow-up communications.
    g. Internal Audit Records.
    h. External Audit Records.
2. The records can be electronic or physical.
3. Manager-CASS is responsible for maintaining and preserving records.
4. It is the responsibility of CASS Auditor, CASS Analyst and Reliability team to provide all relevant records to Manager-CASS
5. CASS Auditor shall provide following:
    a. Non-Conformance Report (NCR)
    b. Corrective Action Plan (CAP) Forms
    c. Audit Reports
    d. Audit Checklist
    e. All Audit records.
6. Reliability Team shall provide following:
    a. Analysis Reports
    b. Corrective Action Plan (CAP) Forms

5 APPENDIX

5.1 APPENDIX-A EXAMPLES OF RCA METHODS

5.1.1 Ishikawa Diagram - Fishbone with 6M (areas)

A fishbone diagram shall be used as a tool to conduct RCA. A fishbone diagram, also called a cause-and-effect diagram or Ishikawa diagram is a visualization tool for categorizing the potential causes of a problem to identify its root causes. It is typically employed by both individuals and teams to brainstorm and logically organize potential causes.

Fishbone diagrams are tools that describe a systematic way of looking at various consequences and causes that make or contribute to these consequences.

This diagram is used to identify the factors that cause the problem.

The basic concept of fishbone diagrams is the name of the problem that gets attention listed on the right of the diagram (or on the head of the fish) and the cause of the problem that might be described as the bones of the main bone.

Possible causes are described as the branches of the main bone are grouped as 6Ms as detailed in Table 4 – Six Ms of the Fish Bone Diagram.

"M" -Characteristic	Description
Manpower	The operational and/or functional labor of people engaged in delivering a product and/or service.
Method	Production processes and their applicable/contributing service delivery processes.
Machine	Facilities, systems, tools, and equipment employed for production.
Material	Raw materials, components, and consumables used to satisfy production and/or service delivery.
Mother Nature/ Environment	Environmental (e.g. weather); "mother nature" (floods, earthquake, etc.); uncontrollable and/or unpredictable events.
Measurement	Inspection and other physical measurements (distance, volume, temperature, pressure, Torque, etc.) whether manual or automatic.

Table 4– Six Ms of the Fish Bone Diagram

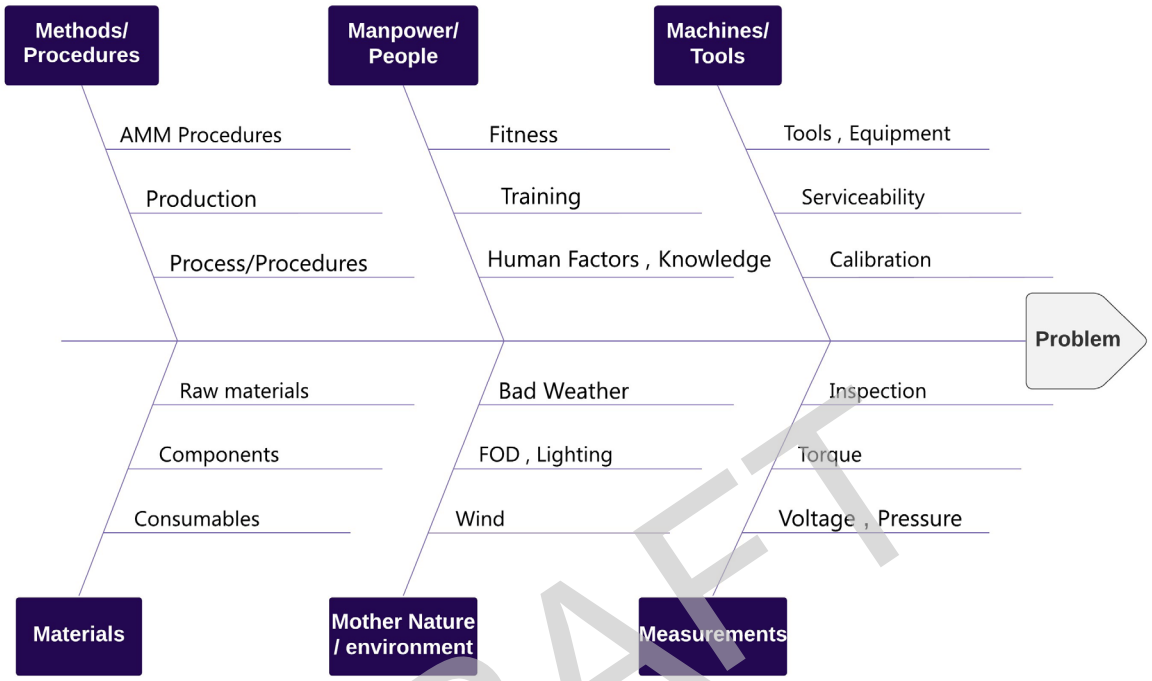

Figure 8 Ishikawa Diagram

5.1.2 5-Whys

The 5 Why method is simply asking the question "Why" enough times until you get past all the symptoms of a problem and down to the root cause.

5 Why is most effective when the answers come from people who have hands-on experience of the process being examined, by repeating the question "Why" we can drive down to the root cause of the problem.

It is not always essential to repeat the question "Why" five times. During the third or fourth "Why," the root cause could be established. It may also take more than five attempts to get through the problem's symptoms and to the fundamental cause.

Figure 9 Five Whys Example 1

In this example analysis, covers many areas – Manpower, Machine(tools), Environment (Lighting) and Methods (procedures) but the root cause is with Machine (Tools). Identified the root cause with 5Ys.

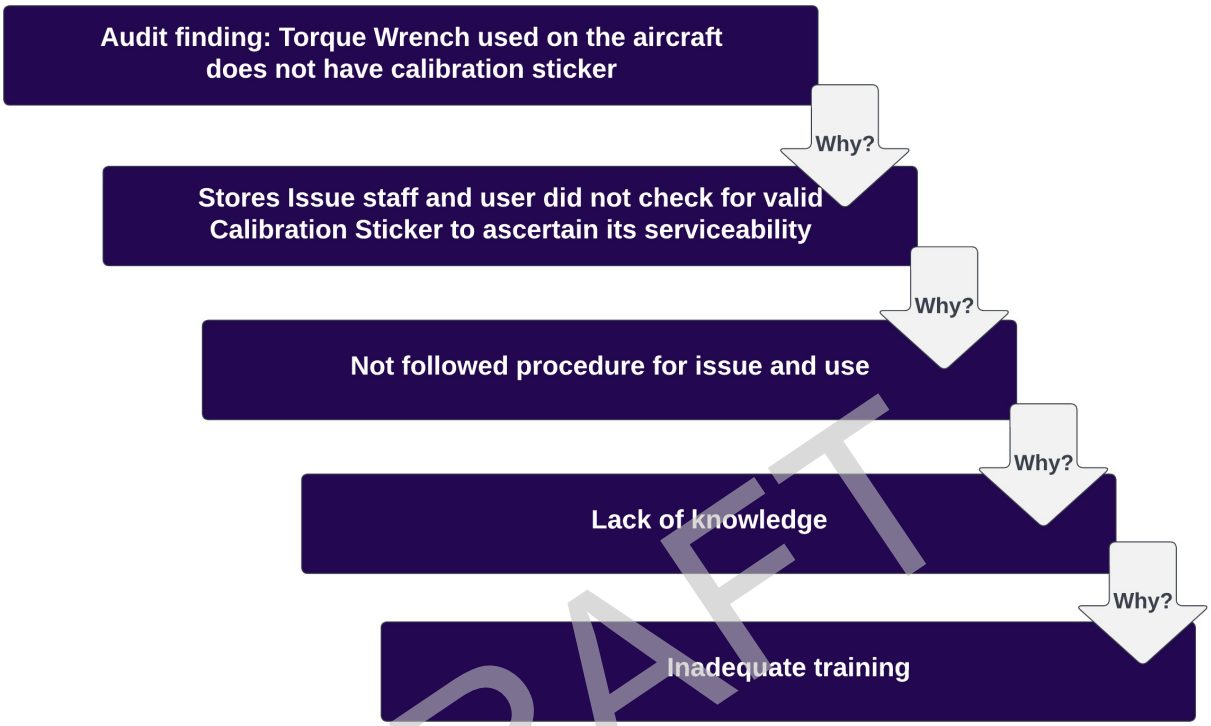

Figure 10 Five Whys Example 2

In this example analysis, covers many areas i.e. Manpower, Materials (tools), Methods (procedures) and Measurement (inspection) but the root cause is with Manpower (inadequate training). Identified the root cause with 4Ys.

5.2 APPENDIX-B FORMS

5.2.1 Audit Plan

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

AUDIT PLAN FOR THE YEAR: _____

Issue: 0
Revision: 0
Date: 20 DEC 2023

GMM Ref	Description / Area of Audit	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
I.	Internal Audit												
II.	Contract Maintenance Provider Audit												
III.	Supplier Audit												

Manager CASS Approval:		Date	

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Figure 11 Audit Plan Pg 1of 1

5.2.2 Audit Checklist

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

AUDIT CHECK LIST

Issue:	0
Revision:	0
Date:	20 DEC 2023

Date of Audit		Area of Audit		Responsible Manager		Location	

Doc Ref	Audit Point	Sat/Un-Sat/NA	Comments / Evidence Details

Manager CASS Approval		Date	

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Figure 12 Audit Checklist Pg 1 of 1

5.2.3 Audit Report

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

AUDIT REPORT

Issue: 0
Revision: 0
Date: 20 DEC 2023

Audit Ref:		Audit Date		Auditor Name		Location	

SN	Details of Shortcomings	Audit Check List Ref	Area of Audit	Responsible Mgr. (Name & Designation)	NC/IR ❶
1					
2					
3					
4					
5					

❶ **NC**- Non-Conformance **IR**- Improvement Required

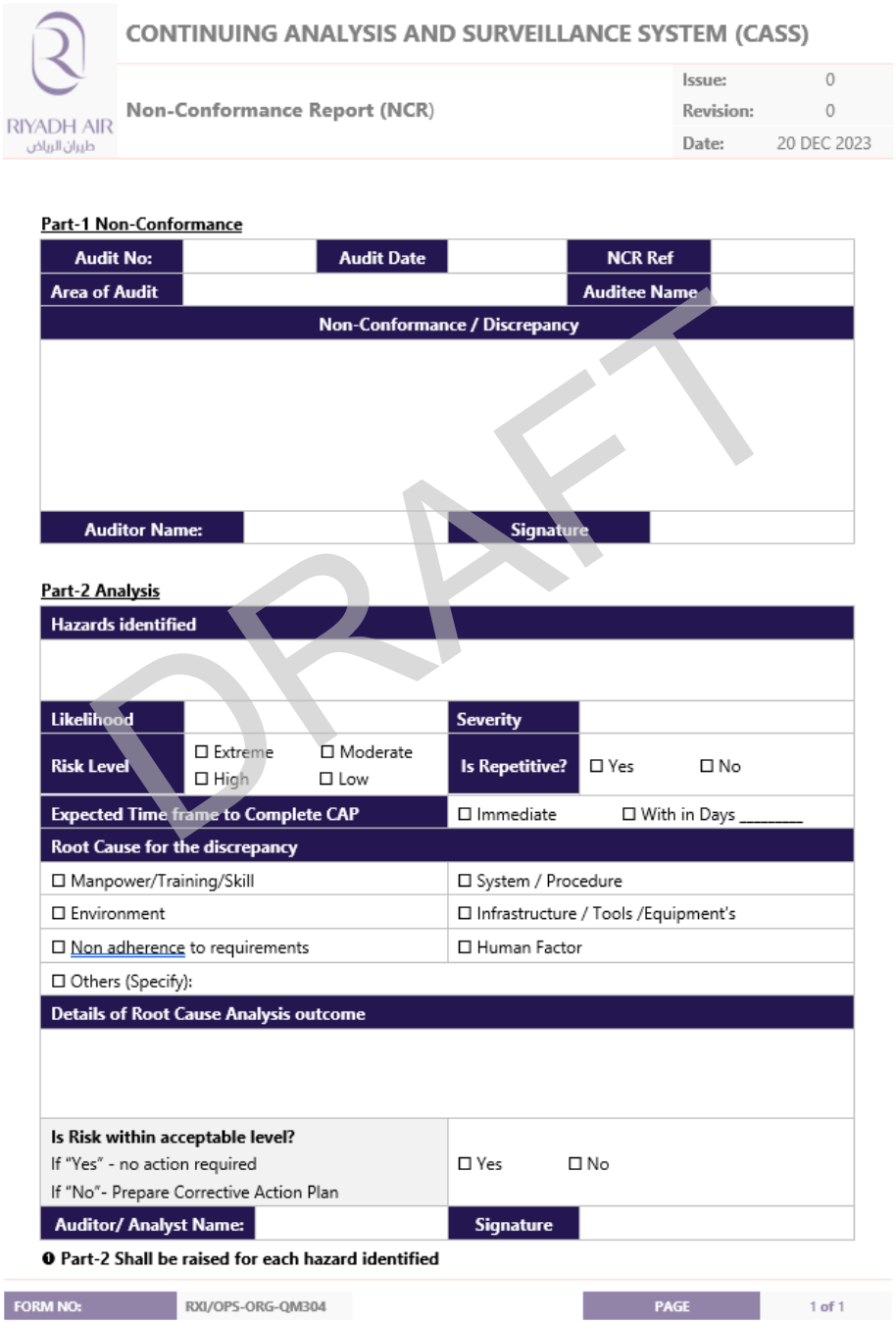
Signature of the Auditor	

Review by Director of Quality & Compliance	
Signature	

FORM NO: RXI/OPS-ORG-QM303 PAGE 1 of 1

Figure 13 Audit Report Pg 1 of 1

5.2.4 Non-Conformance Report (NCR)



CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

Non-Conformance Report (NCR) | Issue: 0 | Revision: 0 | Date: 20 DEC 2023

Part-1 Non-Conformance

Audit No:		**Audit Date**		**NCR Ref**	
Area of Audit				**Auditee Name**	
Non-Conformance / Discrepancy					
Auditor Name:			**Signature**		

Part-2 Analysis

Hazards identified			
Likelihood		**Severity**	
Risk Level	☐ Extreme ☐ Moderate ☐ High ☐ Low	**Is Repetitive?**	☐ Yes ☐ No
Expected Time frame to Complete CAP		☐ Immediate	☐ With in Days _____
Root Cause for the discrepancy			
☐ Manpower/Training/Skill		☐ System / Procedure	
☐ Environment		☐ Infrastructure / Tools /Equipment's	
☐ Non adherence to requirements		☐ Human Factor	
☐ Others (Specify):			
Details of Root Cause Analysis outcome			
Is Risk within acceptable level? If "Yes" - no action required If "No"- Prepare Corrective Action Plan		☐ Yes ☐ No	
Auditor/ Analyst Name:		**Signature**	

❶ **Part-2 Shall be raised for each hazard identified**

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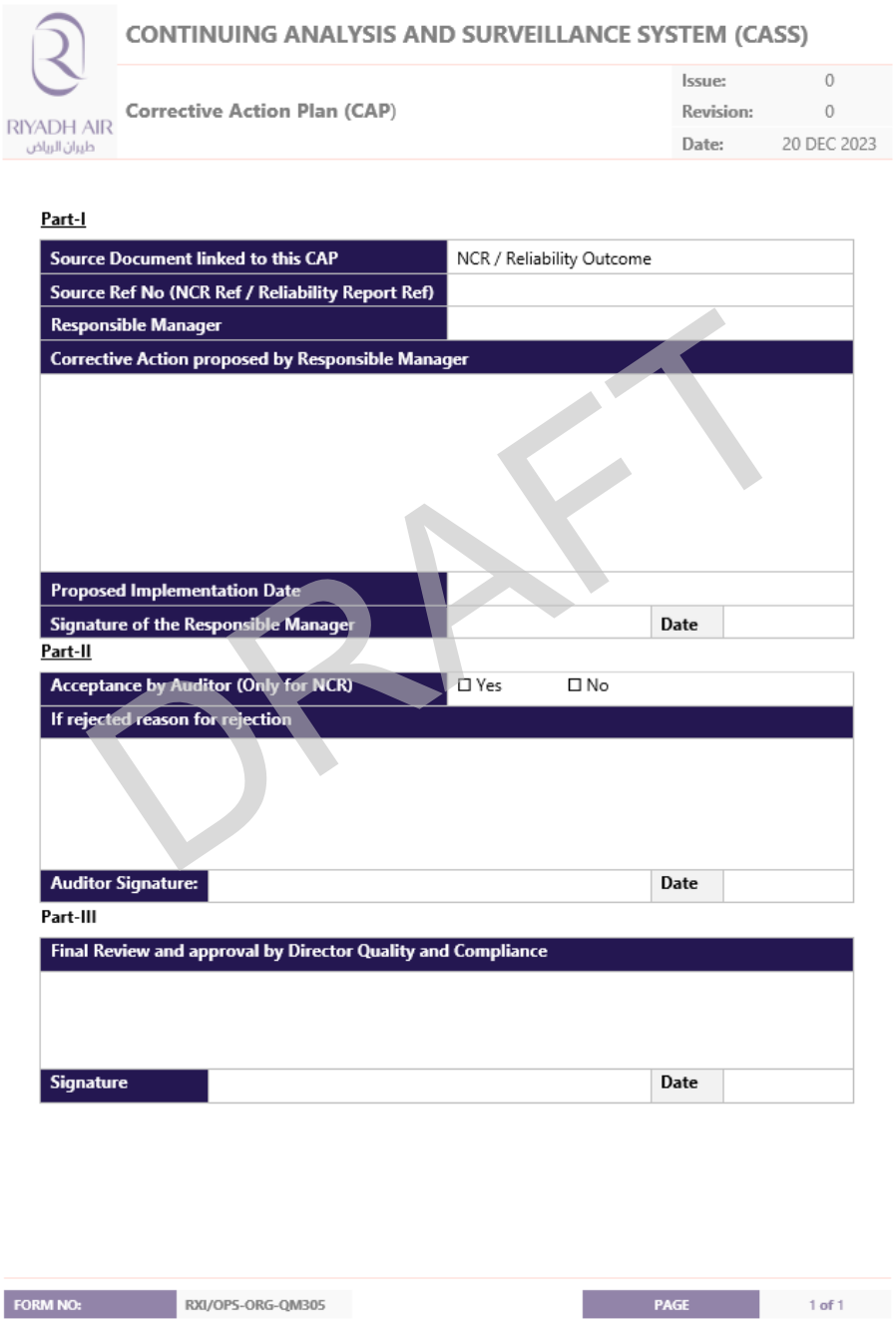
Figure 14 Non-Conformance Report Pg 1 of 1

5.2.5 Corrective Action Plan (CAP)



CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

Corrective Action Plan (CAP)

Issue: 0
Revision: 0
Date: 20 DEC 2023

Part-I

Source Document linked to this CAP	NCR / Reliability Outcome
Source Ref No (NCR Ref / Reliability Report Ref)	
Responsible Manager	
Corrective Action proposed by Responsible Manager	
Proposed Implementation Date	
Signature of the Responsible Manager	Date

Part-II

Acceptance by Auditor (Only for NCR)	☐ Yes ☐ No
If rejected reason for rejection	
Auditor Signature:	Date

Part-III

Final Review and approval by Director Quality and Compliance	
Signature	Date

DRAFT

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Figure 15 Corrective Action Plan Pg 1 of 1

5.2.6 CASS Report

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

CASS-REPORT

Issue: 0
Revision: 0
Date: 20 DEC 2023

CRB Report No:		Date	

I. Decision-making Members

Role	Name	Signature
Director Quality and Compliance (Authority)		
Director of Maintenance		
Director Engineering		
Director Technical Operations		
Director Logistics		
Director Planning & Technical Records		
Director Maintenance Control Center		
Manager CASS		
Manager AMP & Reliability		

II. Support Members

Role	Name	Signature

III. Optional Members

Role	Name	Signature

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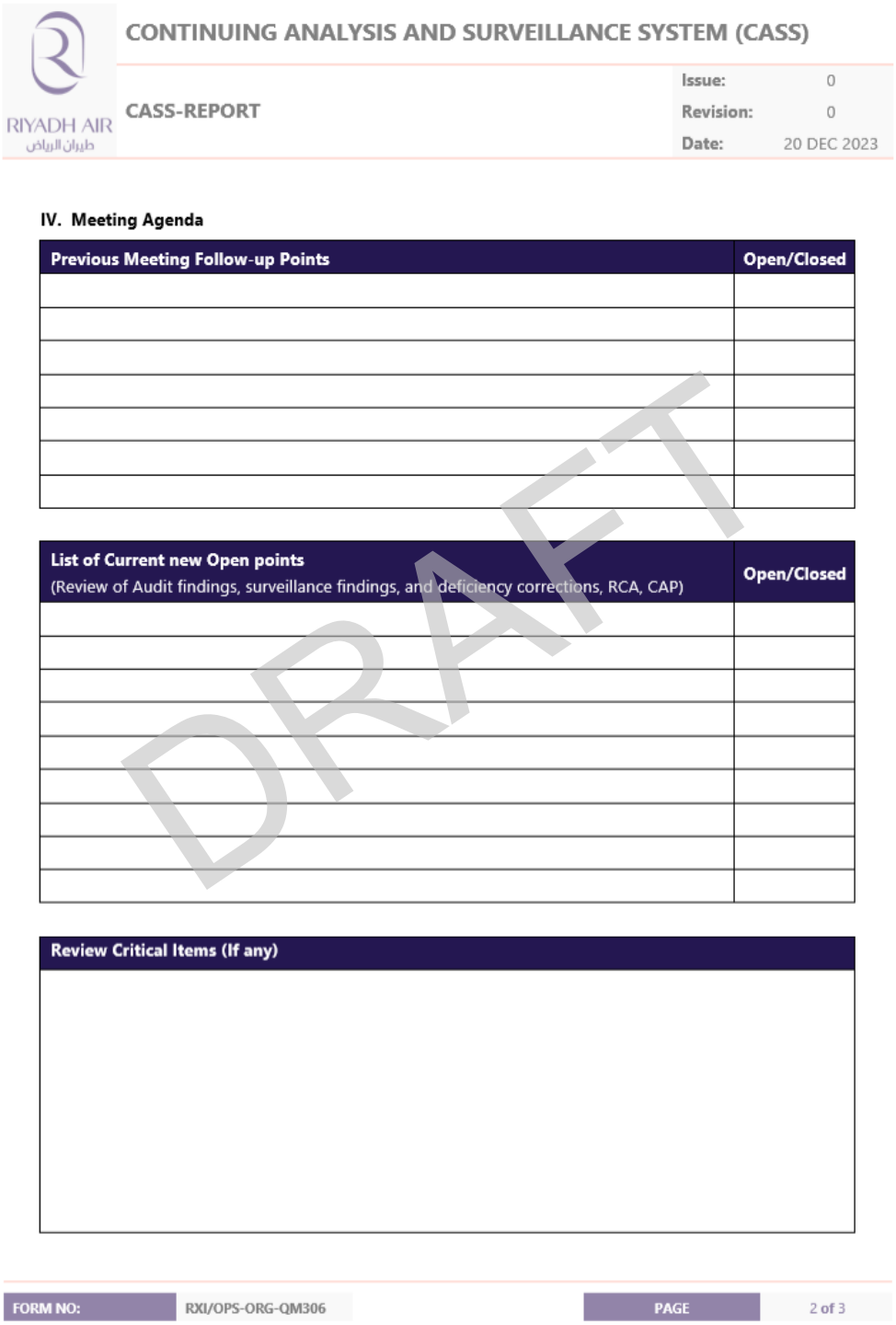
Figure 16 CASS Report Pg 1 of 3



CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

CASS-REPORT

Issue: 0
Revision: 0
Date: 20 DEC 2023

IV. Meeting Agenda

Previous Meeting Follow-up Points	Open/Closed

List of Current new Open points (Review of Audit findings, surveillance findings, and deficiency corrections, RCA, CAP)	Open/Closed

Review Critical Items (If any)

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Figure 17 CASS Report Pg 2 of 3

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

CASS-REPORT

Issue: 0
Revision: 0
Date: 20 DEC 2023

Current meeting outcomes

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Figure 18 CASS Report Pg 3 of 3

5.2.7 MEDA

RIYADH AIR
طيران الرياض

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

Issue: 0
Revision: 0
Date: 20 DEC 2023

Section I—General Information

Reference #:
Airline:
Station of Maintenance System Failure:
Aircraft Type:
Engine Type:
Reg. #:
Fleet Number:
ATA #:
Aircraft Zone:
Ref. # of previous related event:

Interviewer's Name
Interviewer's Telephone #:
Date of Investigation:
Date of Event:
Time of Event: am pm
Shift of Failure:
Type of Maintenance (Mx) (select one):
1. Line: If Line, what type?
2. Base:If Base, what type?
Date Changes Implemented:

Section II – Event

Please select the event (check all that apply)

Operations Process Event
- a. Flight Delay
days hrs. min.
- b. Flight Cancellation
- c. Gate Return
- d. In-Flight Shut Down
- e. Air Turn-Back
- f. Diversion
- g. Smoke/fumes/odor event
- h. Other (explain below)

2. Aircraft Damage Event

3. Personal Injury Event
4. Rework (e.g., did not pass Ops check/inspection)
5. Airworthiness Control
6. Found during Maintenance
7. Found during Flight
8. Other Event (explain below)

Describe the incident/degradation/failure (e.g., could not pressurize) that caused the event.

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Figure 19 MEDA Pg 1of 8

RIYADH AIR
طيران الرياض

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

Issue: 0
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Section III – Maintenance System Failure

Please select the maintenance system failure(s) that caused the event:

1. Installation Failure
- ☐ a. Equipment/part not installed
- ☐ b. Wrong equipment/part installed
- ☐ c. Wrong orientation
- ☐ d. Improper location
- ☐ e. Incomplete installation
- ☐ f. Extra parts installed
- ☐ g. Access not closed
- ☐ h. System/equipment not reactivat /deactivated
- ☐ i. Damaged on remove/replace
- ☐ j. Cross connection
- ☐ k. Mis-rigging (controls, doors, etc.
- ☐ l. Consumable not used
- ☐ m. Wrong consumable used
- ☐ n. Unserviceable part installed
- ☐ o. Other (explain below)

2. Servicing Failure
- ☐ a. Not enough fluid
- ☐ b. Too much fluid
- ☐ c. Wrong fluid type
- ☐ d. Required servicing not performe
- ☐ e. Access not closed
- ☐ f. System/equipment not deactivated/reactivated
- ☐ g. Other (explain below)

3. Repair Failure (e.g., component or structural repair)
- ☐ a. Incorrect
- ☐ b. Unapproved
- ☐ c. Incomplete
- ☐ d. Other (explain below)

4. Fault Isolation/Test/Inspection failure
- ☐ a. Did not detect fault
- ☐ b. Not found by fault isolation
- ☐ c. Not found by operational/ functional test
- ☐ d. Not found by task inspection
- ☐ e. Access not closed
- ☐ f. System/equipment not /reactivated
- ☐ g. Not found by part inspection
- ☐ h. Not found by visual inspection
- ☐ i. Technical log oversight
- ☐ j. Other (explain below)

5. Foreign Object Damage/Debris
- ☐ a. Tooling/equipment left in aircraft/engine
- ☐ b. Debris on ramp
- ☐ c. Debris falling into open systems
- ☐ d. Other (explain below)

6. Airplane/Equipment Damage
- ☐ a. Tools/equipment used improperly
- ☐ b. Defective tools/equipment used
- ☐ c. Struck by/against
- ☐ d. Pulled/pushed/drove into
- ☐ e. Fire/smoke
- ☐ f. Other (explain below)

7. Personal Injury
- ☐ a. Slip/trip/fall
- ☐ b. Caught in/on/between
- ☐ c. Struck by/against
- ☐ d. Hazard contacted (e.g., electricity, hot or cold surfaces, and sharp surfaces)
- ☐ e. Hazardous substance exposure (e.g., toxic or noxious substances)
- ☐ f. Hazardous thermal environment exposure (heat, cold, or humidity)
- ☐ g. Other (explain below)

8. Maintenance Control Failure
- ☐ a. Scheduled task omitted/late/incorrect
- ☐ b. MEL interpretation /application/removal
- ☐ c. CDL interpretation/application/removal
- ☐ d. Incorrectly deferred/controlled defect
- ☐ e. Airworthiness data interpretation
- ☐ f. Technical log oversight
- ☐ g. Airworthiness Directive overrun
- ☐ h. Modification control
- ☐ i. Configuration control
- ☐ j. Records control
- ☐ k. Component robbery control
- ☐ l. Mx information system (entry or update)
- ☐ m. Time expired part on board aircraft
- ☐ n. Tooling control
- ☐ o. Mx task not correctly documented
- ☐ p. Not authorized/qualified/certified to do task
- ☐ q. Other (explain below)

9. Other (explain below)

Did the Maintenance System Failure "fly" on the aircraft? ☐ **Yes** ☐ **No**

Describe the specific maintenance failure (e.g., auto pressure controller installed in wrong location).

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Figure 20 MEDA Pg 2 of 8

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

Issue: 0
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Section IV. Chronological Summary of the Event, including how some Contributing Factors lead to additional Contributing Factors
(Use additional pages, as necessary)

Section V. Summary of Recommendations
(Use additional pages, as necessary)

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Figure 21 MEDA Pg 3 of 8

RIYADH AIR
طيران الرياض

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

Issue: 0
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Date: 20 DEC 2023

Section VI – Contributing Factors Checklist

A. Information (e.g., work cards, maintenance manuals, service bulletins, maintenance tips, non-routines, illustrated parts catalogs, etc.)

N/A ☐

☐ 1. Not understandable information
☐ 2. Unavailable/inaccessible
☐ 3. Incorrect
☐ 4. Too much/conflicting
☐ 5. Update process is too long/complicated
☐ 6. Incorrectly modified manufacturer's MM/SB
☐ 7. Information not used
☐ 8. Inadequate
☐ 9. Uncontrolled
☐ 10. Other (explain below)

Describe specifically how the selected information factor(s) contributed to the system failure.

Recommendations to correct the Contributing Factors listed above.

B. Ground Support Equipment/Tools/Safety Equipment [Personal Protective Equipment (PPE) and Collective Protective Equipment (CPE)]

N/A ☐

☐ 1. Unsafe
☐ 2. Unreliable
☐ 3. Layout of controls or displays
☐ 4. Out of calibration
☐ 5. Unavailable
☐ 6. Inappropriate for the task
☐ 7. Cannot use in intended environment
☐ 8. No instructions
☐ 9. Too complicated
☐ 10. Incorrectly labeled/marked
☐ 11. Not used
☐ 12. Incorrectly used
☐ 13. Inaccessible
☐ 14. Past expiration date
☐ 15. Other (explain below)

Describe specifically how selected ground support equipment/tools/safety equipment factor(s) contributed to the system failure.

Recommendations to correct the Contributing Factors listed above.

C. Aircraft Design/Configuration/Parts/Equipment/Consumables

N/A ☐

☐ 1. Complex
☐ 2. Inaccessible
☐ 3. Aircraft configuration variability
☐ 4. Parts/equipment unavailable
☐ 5. Parts/equipment incorrectly labeled
☐ 6. Inappropriate for the task
☐ 7. Easy to install incorrectly
☐ 8. Not used
☐ 9. Not user friendly
☐ 10. Consumable unavailable
☐ 11. Wrong consumable used
☐ 12. Expired consumable used
☐ 13. Other (explain below)

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CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

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Describe specifically how the selected aircraft design/configuration/parts/equipment/consumables factor(s) contributed to system failure.

Recommendations to correct the Contributing Factors listed above.

D. Job/Task

N/A ☐

☐ 1. Repetitive/monotonous
☐ 2. Complex/confusing
☐ 3. New task or task change
☐ 4. Different from other similar tasks
☐ 5. Other (explain below)

Describe specifically how the selected job/task factor(s) contributed to the system failure.

Recommendations to correct the Contributing Factors listed above.

E. Knowledge/Skills

N/A ☐

☐ 1. Technical skills
☐ 2. Task knowledge
☐ 3. Task planning
☐ 4. Airline process knowledge
☐ 5. Aircraft system knowledge
☐ 6. English language proficiency
☐ 7. Teamwork skills
☐ 8. Computing skills
☐ 9. Other (explain below)

Describe specifically how the selected knowledge/skills factor(s) contributed to the system failure.

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Figure 23

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RIYADH AIR
طيران الرياض

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

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Recommendations to correct the Contributing Factors listed above.

F. Individual Factors

N/A ☐

☐ 1. Physical health (including hearing and sight)
☐ 2. Fatigue
☐ 3. Time pressure
☐ 4. Peer pressure
☐ 5. Complacency
☐ 6. Body size/strength
☐ 7. Personal event (e.g., family problem, car accident)
☐ 8. Task distractions/interruptions
☐ 9. Memory lapse (forgot)
☐ 10. Visual perception
☐ 11. Lack of assertiveness
☐ 12. Stress
☐ 13. Situation awareness
☐ 14. Workload/task saturation
☐ 15. Other (explain below)

Describe specifically how the selected individual factors contributed to the system failure.

Recommendations to correct the Contributing Factors listed above.

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طيران الرياض

CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

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G. Environment/Facilities

N/A ☐

☐ 1. High noise levels
☐ 2. Hot
☐ 3. Cold
☐ 4. Humidity
☐ 5. Rain
☐ 6. Snow
☐ 7. Wind
☐ 8. Lighting
__9. Vibrations
__10. Cleanliness
__11.Hazardous/toxic substance
__12. Power sources
☐ 13. Inadequate ventilation
☐ 14. Markings
☐ 15. Labels/placards/signage
☐ 16. Confined space
☐ 17. Other (explain below)

Describe specifically how the selected <u>environment/facilities</u> factor(s) contributed to the system failure.

Recommendations to correct the Contributing Factors listed above.

H. Organizational Factors

N/A ☐

☐ 1. Quality of support from Technical Organizations (e.g., engineering, planning, technical pubs)
☐ 2. Company policies
☐ 3. Not enough staff
☐ 4. Corporate change/restructuring
☐ 5. Union action
☐ 6. Work process/procedure
☐ 7. Work process/procedure not followed
☐ 8. Work process/procedure not documented (e.g., use tribal knowledge)
☐ 9. Work group normal practice (norm)
☐ 10.Team building
☐ 11.Other (explain below)

Describe specifically how the selected <u>organizational</u> factor(s) contributed to the system failure.

Recommendations to correct the Contributing Factors listed above.

I. Leadership/Supervision

N/A ☐

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CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM (CASS)

MAINTENANCE ERROR DECISION AID (MEDA)

Issue: 0
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Date: 20 DEC 2023

☐1. Planning/organization of tasks
☐2. Prioritization of work
☐3. Delegation/assignment of task
☐4. Unrealistic attitude/expectations
☐5. Does not assure that approved process/procedure is followed
☐6. Amount of supervision
☐7.Other (explain below)

Describe specifically how the selected leadership/supervision factor(s) contributed to the failure.

Recommendations to correct the Contributing Factors listed above.

J. Communication

N/A ☐

☐1. Between departments
☐2. Between mechanics
☐3. Between shifts
☐4. Between maintenance crew and lead
☐5. Between lead and management
☐6. Between flight crew and maintenance
__7.Other (explain below)

Describe specifically how the selected communication factor(s) contributed to the system failure.

Recommendations to correct the Contributing Factors listed above

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Figure 26 MEDA Pg 8 of 8