FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.1	TABLE OF CONTENTS	**Revision:**	00
		Date:	18-Feb-2024

0 FRONT MATTER

0.1 TABLE OF CONTENTS

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.1	TABLE OF CONTENTS	**Revision:**	00
		Date:	18-Feb-2024

FATIGUE RISK MANAGEMENT SYSTEM

0 FRONT MATTER	**Issue:** 00
0.1 TABLE OF CONTENTS	**Revision:** 00
	Date: 18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0 FRONT MATTER	**Issue:** 00
0.2 REVISION HIGHLIGHTS	**Revision:** 00
	Date: 18-Feb-2024

0.2   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 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.

Issue	0	Revision	1	Date	
TITLE					
Section	Section Title		Revision Details	Incorporated by	

Issue	0	Revision	2	Date	
TITLE					
Section	Section Title		Revision Details	Incorporated by	

FATIGUE RISK MANAGEMENT SYSTEM

0 FRONT MATTER	**Issue:** 00
0.2 REVISION HIGHLIGHTS	**Revision:** 00
	Date: 18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER		**Issue:**	00
0.3	RECORD OF REVISIONS		**Revision:**	00
			Date:	18-Feb-2024

0.3 RECORD OF REVISIONS

Issue	Rev	Rev Date	Received via
00	IR/00	18 Feb 2024	

FATIGUE RISK MANAGEMENT SYSTEM

0 FRONT MATTER	**Issue:** 00
0.3 RECORD OF REVISIONS	**Revision:** 00
	Date: 18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.4	RECORD OF TEMPORARY REVISIONS	**Revision:**	00
		Date:	18-Feb-2024

0.4 RECORD OF TEMPORARY REVISIONS

N	**New**	**A**	**Add**	**D**	**Delete**	**R**	**Replace**

Temporary Revision No.	Section No.	Page No.	Change Highlights	Effective Date

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.4	RECORD OF TEMPORARY REVISIONS	**Revision:**	00
		Date:	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.5	LIST OF EFFECTIVE PAGES	**Revision**	00
		Date:	18-Feb-2024

0.5 LIST OF EFFECTIVE PAGES

Issue	Revision	Section	Page	Eff. Date	Issue	Revision	Section	Page	Eff. Date
00	00	0	0-1	18-FEB-24	00	00	0	0-20	18-FEB-24
00	00	0	0-2	18-FEB-24	00	00	0	0-21	18-FEB-24
00	00	0	0-3	18-FEB-24	00	00	0	0-22	18-FEB-24
00	00	0	0-4	18-FEB-24	00	00	0	0-23	18-FEB-24
00	00	0	0-5	18-FEB-24	00	00	0	0-24	18-FEB-24
00	00	0	0-6	18-FEB-24	00	00	0	0-25	18-FEB-24
00	00	0	0-7	18-FEB-24	00	00	0	0-26	18-FEB-24
00	00	0	0-8	18-FEB-24	00	00	0	0-27	18-FEB-24
00	00	0	0-9	18-FEB-24	00	00	0	0-28	18-FEB-24
00	00	0	0-10	18-FEB-24	00	00	0	0-29	18-FEB-24
00	00	0	0-11	18-FEB-24	00	00	0	0-30	18-FEB-24
00	00	0	0-12	18-FEB-24	00	00	0	0-31	18-FEB-24
00	00	0	0-13	18-FEB-24	00	00	0	0-32	18-FEB-24
00	00	0	0-14	18-FEB-24	00	00	0	0-33	18-FEB-24
00	00	0	0-15	18-FEB-24	00	00	0	0-34	18-FEB-24
00	00	0	0-16	18-FEB-24	00	00	0	0-35	18-FEB-24
00	00	0	0-17	18-FEB-24	00	00	0	0-36	18-FEB-24
00	00	0	0-18	18-FEB-24	00	00	1	1-1	18-FEB-24
00	00	0	0-19	18-FEB-24	00	00	1	1-2	18-FEB-24

Riyadh Air		**GACA Accepted by:**	
Name:		Name:	
Title:		Title:	
Sign and Date:		Sign & Date:	
		Stamp:	

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.5	LIST OF EFFECTIVE PAGES	**Revision:**	00
		Date:	18-Feb-2024

Issue	Revision	Section	Page	Eff. Date	Issue	Revision	Section	Page	Eff. Date
00	00	1	1-3	18-FEB-24	00	00	2	2-6	18-FEB-24
00	00	1	1-4	18-FEB-24	00	00	2	2-7	18-FEB-24
00	00	1	1-5	18-FEB-24	00	00	2	2-8	18-FEB-24
00	00	1	1-6	18-FEB-24	00	00	2	2-9	18-FEB-24
00	00	1	1-7	18-FEB-24	00	00	2	2-10	18-FEB-24
00	00	1	1-8	18-FEB-24	00	00	2	2-11	18-FEB-24
00	00	1	1-9	18-FEB-24	00	00	2	2-12	18-FEB-24
00	00	1	1-10	18-FEB-24	00	00	3	3-1	18-FEB-24
00	00	1	1-11	18-FEB-24	00	00	3	3-2	18-FEB-24
00	00	1	1-12	18-FEB-24	00	00	3	3-3	18-FEB-24
00	00	1	1-13	18-FEB-24	00	00	3	3-4	18-FEB-24
00	00	1	1-14	18-FEB-24	00	00	3	3-5	18-FEB-24
00	00	1	1-15	18-FEB-24	00	00	3	3-6	18-FEB-24
00	00	1	1-16	18-FEB-24	00	00	3	3-7	18-FEB-24
00	00	2	2-1	18-FEB-24	00	00	3	3-8	18-FEB-24
00	00	2	2-2	18-FEB-24	00	00	4	4-1	18-FEB-24
00	00	2	2-3	18-FEB-24	00	00	4	4-2	18-FEB-24
00	00	2	2-4	18-FEB-24	00	00	4	4-3	18-FEB-24
00	00	2	2-5	18-FEB-24	00	00	4	4-4	18-FEB-24

Riyadh Air		**GACA Acceptedby:**	
Name:		Name:	
Title:		Title:	
Sign and Date:		Sign & Date:	
		Stamp:	

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.5	LIST OF EFFECTIVE PAGES	**Revision:**	00
		Date:	18-Feb-2024

Issue	Revision	Section	Page	Eff. Date	Issue	Revision	Section	Page	Eff. Date
00	00	4	4-5	18-FEB-24	00	00			18-FEB-24
00	00	4	4-6	18-FEB-24	00	00			18-FEB-24
00	00	4	4-7	18-FEB-24	00	00			18-FEB-24
00	00	4	4-8	18-FEB-24	00	00			18-FEB-24
00	00	4	4-9	18-FEB-24	00	00			18-FEB-24
00	00	4	4-10	18-FEB-24	00	00			18-FEB-24
00	00	4	4-11	18-FEB-24	00	00			18-FEB-24
00	00	4	4-12	18-FEB-24	00	00			18-FEB-24
00	00	4	4-13	18-FEB-24	00	00			18-FEB-24
00	00	4	4-14	18-FEB-24	00	00			18-FEB-24
00	00	4	4-15	18-FEB-24	00	00			18-FEB-24
00	00	4	4-16	18-FEB-24	00	00			18-FEB-24
00	00	5	5-1	18-FEB-24	00	00			18-FEB-24
00	00	5	5-2	18-FEB-24	00	00			18-FEB-24
00	00	6	6-1	18-FEB-24	00	00			18-FEB-24
00	00	6	6-2	18-FEB-24	00	00			18-FEB-24
00	00			18-FEB-24	00	00			18-FEB-24
00	00			18-FEB-24	00	00			18-FEB-24
00	00			18-FEB-24	00	00			18-FEB-24

Riyadh Air		**GACA Accepted by:**	
Name:		Name:	
Title:		Title:	
Sign and Date:		Sign & Date:	
		Stamp:	

FATIGUE RISK MANAGEMENT SYSTEM

0 FRONT MATTER	**Issue:** 00
0.5 LIST OF EFFECTIVE PAGES	**Revision:** 00
	Date: 18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.6	LIST OF TABLES	**Revision:**	00
		Date:	18-Feb-2024

0.6   LIST OF TABLES

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER		**Issue:**	00
0.6	LIST OF TABLES		**Revision:**	00
			Date:	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.7	LIST OF FIGURES	**Revision:**	00
		Date:	18-Feb-2024

0.7 LIST OF FIGURES

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER		**Issue:**	00
0.7	LIST OF FIGURES		**Revision:**	00
			Date:	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER
0.8	LIST OF COMPLIANCE ENTRIES

Issue: 00
Revision: 00
Date: 18-Feb-2024

0.8   LIST OF COMPLIANCE ENTRIES

SECTION	TITLE	TYPE	REGULATION | STANDARD
0.11.3	COMMON LANGUAGE	IOSA	FLT 3.1.1
0.11.4	USAGE OF TERMS		
0.11.5	HUMAN FACTOR PRINCIPLES	GACAR	121.139, 121.533
		IOSA	FLT 1.7.4
0.13.3	DISTRIBUTION LIST AND AVAILABILITY	GACAR	121.151, 121.155
0.13.4	PUBLICATION HIERARCHY	IOSA	ORG 2.5.3
0.13.8	FORMAT AND DOCUMENTATION CONTROL REQUIREMENTS	IOSA	ORG 2.5.1, ORG 2.5.3
1.2	FATIGUE MANAGEMENT POLICY	GACAR	PART 5 APP G, PART 121 SUBPART N ,
		IOSA	FLT 3.4.3(B), FL3.4.3(C),CAB 3.1.4(B) & 3.1.4 (C)
1.5	FATIGUE RISK MANAGEMENT PROCESSES	GACAR	PART 5 APPENDIX G (II)
		IOSA	FLT 3.4.3(B), 3.4.3(C), CAB 3.1.4(B) & 3.1.4 (C)
1.6	FRMS SAFETY ASSURANCE PROCESSES	GACAR	PART 5 APPENDIX G (III),
		IOSA	FLT 3.4.3(B), 3.4.3(C), CAB 3.1.4(B) & 3.1.4 (C)
1.7	FRMS DOCUMENTATION AND RECORDS	GACAR	PART 5 APP G I(B),
		IOSA	FLT 3.4.3(B), FLT 3.4.3(C),CAB 3.1.4(B) & 3.1.4 ©
1.10.1	FRMS SAFETY OBJECTIVE		
2	TRAINING AND EDUCATION	GACAR	PART 5 APPENDIX G (IV),
		IOSA	FLT 3.4.3(B), FLT 3.4.3(C),CAB 3.1.4(B) & 3.1.4 (C)
2.1	DETERMINING TRAINING NEED		
2.4	FRMS COMMUNICATION	IOSA	FLT 3.4.3(B), FLT 3.4.3(C),CAB 3.1.4(B) & 3.1.4 (C)
3.1	FLIGHT CREW AND CABIN CREW DUTY TIME LIMITATIONS	GACAR	PART 117

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.8	LIST OF COMPLIANCE ENTRIES	**Revision:**	00
		Date:	18-Feb-2024

3.2	MAINTENANCE AND PREVENTIVE MAINTENANCE PERSONNEL DUTY TIME LIMITATIONS	GACAR	PART 121.1033
3.3	AIRCRAFT DISPATCHER DUTY TIME LIMITATIONS	GACAR	PART 121.1033
5	CONTROLLED REST ON THE FLIGHT DECK	ICAO	DOC 9966 APPENDIX C

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.9	MANAGEMENT APPROVAL	**Revision:**	00
		Date:	18-Feb-2024

0.9 MANAGEMENT APPROVAL

Manual Number:	**RXI/OPS-ORG-M07**
Title:	**FATIGUE RISK MANAGEMENT SYSTEM**
Issue:	00
Revision:	00

Recommended by:		Date:
Title:		
Signature:		

Quality Review by:		Date:
Title:		
Signature:		

Approved by:		Date:
Title:		
Signature:		

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.9	MANAGEMENT APPROVAL	**Revision:**	00
		Date:	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.10	GACA APPROVAL / ACCEPTANCE	**Revision:**	00
		Date:	18-Feb-2024

0.10   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 accepted/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. 18 Feb 2024.

This manual becomes 'uncontrolled' when printed.

Name:		Date:
Title:		
Signature:		
Stamp:		

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.10	GACA APPROVAL / ACCEPTANCE	**Revision:**	00
		Date:	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0   FRONT MATTER

0.11   INTRODUCTION

Issue: 00

Revision: 00

Date: 18-Feb-2024

0.11   INTRODUCTION

0.11.1   PREFACE

The Fatigue Risk Management System Manual is a comprehensive document encompassing all necessary instructions and information relevant to the domain of Fatigue Management at Riyadh Air. This manual is issued in strict accordance with the requirements outlined in GACAR Part 121 subpart N, GACAR Part 5, Appendix G and ISARPs (FLT and CAB).

In collaboration with GACA, Riyadh Air is steadfast in its commitment to diminishing risks and causal factors associated with fatigue events. The Company has instituted a systematic program designed to collect data, analyze trends, and proactively address or mitigate crew member fatigue. The primary objective of this system is to minimize the risks associated with crew members flying while fatigued, concurrently reducing external factors that may contribute to fatigue.

Within the Fatigue Risk Management System Manual (FRMS), Riyadh Air has incorporated measures such as enhanced education, the establishment of a non-punitive reporting framework for fatigue, improved scheduling practices, identification, and mitigation of stressors leading to fatigue, and the promotion of crew health and wellbeing.

It's imperative to note that the procedures and instructions outlined in this manual are grounded in the latest technical data and operational experience accumulated up to the time of publication, ensuring the most up-to-date and relevant guidance for managing fatigue within the airline's operations.

The content of this manual does not supersede or amend Riyadh Air aircraft type documentation or any other approved and current documentation. Where information in this manual is at variance with any approved and current technical documentation and/or applicable national regulations, the latter shall be regarded as the authoritative source.

All Riyadh Air operations personnel are required to be familiar with the contents of this Manual.

The Copyright of this manual remains with Riyadh Air. No parts of this publication shall be reproduced, stored in a retrieval system, or transmitted in any form or by any means i.e., electronic, mechanical photocopy and recording or otherwise without written permission of Riyadh Air.

Questions with respect to the information contained in this manual should be addressed to the Safety Department (for the attention of the VP SSE)

_____

Accountable Executive

FATIGUE RISK MANAGEMENT SYSTEM

0   FRONT MATTER

0.11 INTRODUCTION

Issue: 00

Revision: 00

Date: 18-Feb-2024

0.11.2   Applicability

The FRMS Manual is applicable to all Riyadh Air employees.

0.11.3   Common Language

IOSA FLT 3.1.1

English shall be the language used for all operational communications at Riyadh Air. This is to help eliminate misunderstandings and ensure clear and standardized interactions between all employees. Riyadh Air's decision to implement English as a language protocol is a strategic one aimed at promoting safety and consistency within its operational framework.

For general Common Language please refer to Corporate Policy Manual, Section 0.11.1.

0.11.4   Usage of Terms

FRMS applies to both male and female employees. For simplification a gender-neutral text is used in this manual. Throughout this manual, specific terms (e.g., shall, should, may etc.) are used to provide precise instructions and expectations within the context of Riyadh Air's operations. These terms serve distinct purposes and outline the level of obligation or permission associated with each action.

For general Use of Terms please refer to Corporate Policy Manual Section 0.11.2.

0.11.5   Human Factor Principles

GACAR § 121.139 / GACAR § 121.533 / IOSA FLT 1.7.4

At Riyadh Air, human factors principles are applied to manuals, checklists, procedure design, personnel training and to operations and maintenance equipment, systems, processes, and procedures. They consider human capabilities and limitations, as well as the safe interface between the human and system components, for the purpose of optimizing human performance and reducing human error.

Incorporating human factor principles into the design of our FRMS manual and procedures is crucial for optimizing safety and efficiency. Riyadh Air captures human factors principles in document design and checklist usage by:

1. Preparing documentation in a useable format for information presentation, at the appropriate reading level and with the required degree of technical sophistication and clarity.

2. Improving user performance through the use of effective and consistent labels, symbols, colors, terms, acronyms, abbreviations, formats, and data fields.

3. Ensuring the availability and usability of information to the user for specific tasks, when needed and in a form that is directly usable.

4. Designing operational procedures for simplicity, consistency, and ease of use.

5. Minimizing the need for special or unique operator skills, abilities, tools, or characteristics.

6. Assessing the net demands or impacts upon the physical, cognitive, and decision-making resources of our employees, using objective and subjective performance measures.

0.11.6   Applicable Regulations and Standards

Throughout this manual, compliance tags are used to help users easily locate and reference applicable regulations, rules, standards, and recommended practices. These tags are a systematic and organized way to manage and ensure adherence to regulatory requirements, company policies and industry standards.

This allows Riyadh Air to ensure that all regulatory standards imposed by the GACA and other aviation authorities are explicitly covered. Where an applicable regulation, rule or standard exists, the relevant section of the Operations Manual includes a header bar listing the applicable regulation and/or standard (example below).

Example Header:

GACAR § 121.123

The following regulations and standards addressed in this manual, include:

1. GACA Regulations:

    a. PART 4 - OCCURRENCE REPORTING AND SAFETY INFORMATION SYSTEM

    b. PART 5 - SAFETY MANAGEMENT SYSTEMS

    c. PART 117 - FLIGHT AND DUTY LIMITATIONS AND REST REQUIREMENTS: FLIGHT CREW MEMBERS

    d. PART 121 - OPERATIONS: COMMERCIAL AIR OPERATORS OPERATING TRANSPORT CATEGORY AIRCRAFT OR COMMUTER CATEGORY AIRPLANES

2. IATA Standards Manual, applicable edition.

3. Aviation Investigation Bureau Regulations (AIBR)

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	Issue:	00
0.11	INTRODUCTION	Revision:	00
		Date:	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.12	ABBREVIATIONS, ACRONYMS AND DEFINITIONS	**Revision:**	00
		Date:	18-Feb-2024

0.12   ABBREVIATIONS, ACRONYMS AND DEFINITIONS

0.12.1   ABBREVIATIONS AND ACRONYMS

Abbreviations	
A	
AC	Advisory Circular
AIBR	Aviation Investigation Bureau Regulations
AOC	Air Operator Certificate
C	
CPM	Company Policy Manual
D	
DMS	Document Management System
E	
ERP	Emergency Response Plan
F	
FAA	Federal Aviation Administration
FDAP	Flight Data Analysis Program
FRC	Fatigue Review Committee
FRM	Fatigue Risk Management
FRMS	Fatigue Risk Management System
FSAG	Flight Safety Action Group
FSDS	Flight Safety Documentation System
G	
GACA	General Authority of Civil Aviation
GACAR	General Authority of Civil Aviation Regulations
I	
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IOSA	IATA Operations and Safety Audit
L	
LEP	List of Effective Pages
O	
OM	Operations Manual
P	
POI	Principle Operations Inspector
R	
RXI	Riyadh Air
S	

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.12	ABBREVIATIONS, ACRONYMS AND DEFINITIONS	**Revision:**	00
		Date:	18-Feb-2024

SMC	Safety Management Committee
SME	Subject Matter Expert
SMM	Safety Management Manual
SMS	Safety Management System
W	
WOCL	Window of Circadian Low

0.12.2   Acronyms

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

0.12.3   DEFINITIONS

A	
Acute Fatigue	Acute fatigue is closely related to recent sleep (i.e., sleep within the last 24 hours), time since last sleep, and current time of day. Less than 8 hours of sleep in the last 24 hours, being awake longer than 17 hours, and working between midnight and 0600 are associated with acute fatigue in the average person.
B	
Biomarkers	Biomarkers are characteristic biological properties that can be detected and measured in the body, such as in the blood or tissue. Biomarkers may indicate either normal, abnormal, or diseased processes in the body. Currently, there are no easily obtainable biomarkers of fatigue. However, several biomarkers of the circadian rhythm exist, such as core body temperature and melatonin levels. In the absence of biomarkers to identify fatigue, we can measure fatigue effects directly, in performance variables, or indirectly, by using measures of sleep and time of day and by modeling the effects of these conditions on performance.
C	
Chronic Fatigue	The average person needs about 8 hours of sleep per day. If the average person gets less than the required amount of sleep each day for multiple days, then a state of chronic fatigue can occur. With chronic fatigue, performance is degraded, and recovery tends to be relatively slow. A person can hasten recovery by attempting to sleep longer than the normal amount for several days.

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:**	00
0.12	ABBREVIATIONS, ACRONYMS AND DEFINITIONS	**Revision:**	00
		Date:	18-Feb-2024

Circadian Fatigue	Circadian fatigue refers to reduced performance during nighttime hours, particularly during an individual's Window of Circadian Low (WOCL), typically between 0200 and 0600 hours.
F	

Fatigue	A physiological state of reduced alertness or capability to perform mental or physical tasks, which:
	
	 1. May impair the ability of the crew member to safely operate an aircraft.
	
	 2. Is caused by one or more of the following:
	    a. The crew member's lack of sleep
	    b. The crew member's extended wakefulness
	    c. The crew member's circadian phase at any relevant time
	    d. The crew member's workload of mental activities, and/or physical activities at any relevant time.

FRMS	A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience, which aims to ensure relevant personnel are performing at adequate levels of alertness.
W	
Window of Circadian Low (WOCL)	Individuals living on a regular 24-hour routine with sleep at night have two periods of maximum sleepiness, also known as WOCLs. One WOCL occurs at night, roughly from 0200 to 0600, a time when physiological sleepiness is greatest and performance capabilities are lowest. The other WOCL is in the afternoon, roughly from 1500 to 1700, and is less severe than the nighttime WOCL.

FATIGUE RISK MANAGEMENT SYSTEM

0 FRONT MATTER	**Issue:**	00
	Revision:	00
0.12 ABBREVIATIONS, ACRONYMS AND DEFINITIONS	**Date:**	18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

0   FRONT MATTER

0.13   SYSTEM OF AMENDMENT AND REVISION

Issue:	00
Revision:	00
Date:	18-Feb-2024

0.13   SYSTEM OF AMENDMENT AND REVISION

0.13.1   Manual Ownership

The Vice President Corporate Safety, Security & Environment is responsible for overseeing FRMS manual and serves as the Manual Owner. All revisions to the manual undergo a structured approval process.

The VPCSSE has the final authority to approve amendments to FRMS manual. This emphasizes the manual owner's significance in ensuring document accuracy and compliance. Any amendments that require GACA approval or acceptance are submitted for review before they are published.

To ensure efficient dissemination of information, all approved amendments are shared electronically with manual holders. This aligns with Riyadh Air's commitment to transparent and accessible communication of operational updates.

This systematic approach reflects Riyadh Air's dedication to upholding rigorous standards in documentation.

0.13.2   Manual Holder Responsibility

No personnel within the Riyadh Air framework may perform their duties without access to a current copy of the relevant and applicable manuals. This policy highlights the importance of real-time information in creating a safe and efficient operational environment. Regular manual updates not only help conform to regulations but also enhance the overall effectiveness of our personnel in carrying out their responsibilities with precision and in accordance with industry best practices.

0.13.3   Distribution List and Availability

GACAR § 121.151 / § 121.155

For details refer to Corporate Policy Manual, Section 0.13.3.

0.13.4   Publication Hierarchy

IOSA ORG 2.5.3

For details refer to Corporate Policy Manual, Section 4.2.1.

0.13.5   Manual Structure

The manual is divided into 5 chapters and the Appendix as depicted in section 0.1.

FATIGUE RISK MANAGEMENT SYSTEM

0	FRONT MATTER	**Issue:** 00
0.13	SYSTEM OF AMENDMENT AND REVISION	**Revision:** 00
		Date: 18-Feb-2024

0.13.6   Source of Amendments

Refer to Corporate Policy Manual, Section 0.13.6.

0.13.7   Referenced and Linked Documents

The FRMS manual is interconnected with the following Regulations and Manuals. When changes are made to any of the below Regulations or Manuals, Riyadh Air undertakes a review of the relevant changes for incorporation into PUPSP.

1.   GACAR - Safety Regulations.

2.   CPM - Corporate Policy Manual.

3.   Corporate Safety Management Manual (CSMM).

0.13.8   Format and Documentation Control Requirements

IOSA ORG 2.5.1 / ORG 2.5.3

For general Format and Documentation Control Requirements refer to Corporate Policy Manual, Section 0.13.8 and 0.13.9.

0.13.9   Error Reporting and Corrections And Suggestions For Improvement

All personnel are responsible for maintaining the accuracy and integrity of Riyadh Air's operations. If an employee comes across an error, notices any incorrect information in this manual or has a suggestion, they should report it to the Safety Office. They will acknowledge receipt of the information and provide feedback to the concerned employee on their suggestion, the action taken to fix the error or update the information.

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
1.1	INTRODUCTION	**Revision:**	00
		Date:	18-Feb-2024

1 MANAGEMENT AND CONTROL

1.1 INTRODUCTION

A FRMS is a management system for Riyadh Air designed to mitigate the impacts of fatigue in its specific operations. Grounded in scientific principles and operational expertise, this data-driven system enables continuous monitoring and management of safety risks linked to fatigue-related errors. As a fatigue mitigation tool, the FRMS works to minimize both acute and chronic sources of fatigue, effectively handling potential risks associated with fatigue. Integrated into a cyclic performance improvement process, the FRMS consistently enhances safety by identifying and addressing fatigue factors over time and adapting to changing physiological and operational conditions. The overarching goal of Riyadh Air's FRMS is to effectively manage, monitor, and mitigate the effects of fatigue, ultimately enhancing the alertness of flight crew members and other personnel mentioned in Section 1.3 and reducing the occurrence of performance errors.

FATIGUE RISK MANAGEMENT SYSTEM

1 MANAGEMENT AND CONTROL	**Issue:** 00
1.2 FATIGUE MANAGEMENT POLICY	**Revision:** 00
	Date: 18-Feb-2024

1.2   FATIGUE MANAGEMENT POLICY

GACAR PART 5 APP G, GACAR PART 121 SUBPART N ,

IOSA FLT 3.4.3(B), FL3.4.3(C),CAB 3.1.4(B) & 3.1.4 (C)

Riyadh Air is committed to managing fatigue, ensuring the safety and well-being of company personnel, passengers, and the public, and complying with regulatory requirements and industry best practices.

Riyadh Air recognizes that fatigue is a significant risk to safe operations and is committed to managing and mitigating fatigue-related risks through the implementation of a comprehensive Fatigue Risk Management System (FRMS).

Riyadh Air Commits to:

1.   Effectively manage FRMS as a shared responsibility of management, crew member, and other involved personnel for managing and mitigating fatigue-related risks,

2.   Effective safety reporting, provision of adequate resources for the FRMS, continuous improvement of the FRMS, and identifying clear lines of responsibility for management, crew members, and all involved personnel,

3.   Emphasizing the promotion of a safety culture and the prevention of fatigue-related incidents, and

4.   Aligning FRMS with industry best practices and regulatory requirements, focusing on promoting a safety culture, ensuring operational resilience, and enhancing the well-being of personnel.

Riyadh Air Fatigue Risk Management objectives:

1.   Establishes processes for the assessment and mitigation of fatigue-related risks, including the use of scientifically validated tools and methods to assess and manage fatigue risks.

2.   Mitigation strategies are developed and implemented based on the results of fatigue risk assessments, with a focus on proactive measures to prevent and reduce fatigue-related incidents.

3.   Comprehensive education and training programs to increase awareness and understanding of fatigue-related issues among management, crew members, and other involved personnel.

4.   Clear guidelines and processes for the development of schedules and rosters considering circadian rhythms, rest requirements, that minimize the risk of fatigue.

These objectives apply to Riyadh Air management and employees. The Riyadh Air Accountable Executive holds the responsibility and accountability for the implementation of the FRMS.

Accountable Executive

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
1.3	FRMS SCOPE AND OBJECTIVES	**Revision:**	00
		Date:	18-Feb-2024

1.3   FRMS SCOPE AND OBJECTIVES

FRMS is applicable to following personnel:

1.   Flight Crew Members.

2.   Cabin Crew Members.

3.   Engineers. and Maintenance personnel.

In the FRMS for Riyadh Air, the flight crew and cabin crew are subject to the FRMS guidelines in addition to FDTL requirements as mentioned in GACAR Part 117. All other employees are expected to adhere to the prescriptive duty time limitations outlined in their respective operating department manuals. Nevertheless, fatigue reporting is accessible and applicable to all employees.

The primary objective of the FRMS at Riyadh Air is to delineate management policies and procedures aimed at minimizing the risks of fatigue among Flight Crew, Flight Engineers, Maintenance and Preventive Maintenance personnel, Aircraft Dispatchers and Cabin Crew Members. Additionally, Riyadh Air's FRMS has a secondary objective, which is to diminish fatigue-related risks among non-flight crew member employees, recognizing that their fatigue could potentially impact flight safety adversely.

The overarching goal of the FRMS is to elevate the safety standards of processes. This is to be achieved through comprehensive fatigue awareness education and training for employees. The FRMS also seeks to effectively mitigate fatigue risks, ensuring they are reduced to an acceptable level for employees across the organization.

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL		**Issue:**	00
1.4	OVERVIEW OF FATIGUE RISK MANAGEMENT		**Revision:**	00
			Date:	18-Feb-2024

1.4 OVERVIEW OF FATIGUE RISK MANAGEMENT

Riyadh Air is unwavering in its commitment to minimizing risks and causal factors associated with fatigue events. In pursuit of heightened safety standards, the Company has instituted a systematic program designed to collect data, analyze trends, and proactively eliminate or mitigate crew member fatigue. The primary objective of this initiative is to decrease the likelihood of crew members operating in a fatigued state while concurrently minimizing external influences that may contribute to fatigue.

Refer OM-G (OCC manual) chapter 3.2.2. for Planning Tools and Techniques.

The FRMS Manual encompasses a multifaceted approach, incorporating enhanced education, non-punitive reporting of fatigue incidents, improved scheduling practices, identification and mitigation of stressors leading to fatigue, and a focus on promoting employee health and well-being. The fatigue awareness initiatives and procedures outlined in the Riyadh Air FRMS contribute to the establishment of a dynamic safety culture through comprehensive employee training, reporting mechanisms, and trend analysis.

Riyadh Air underscores the imperative that individuals responsible for roles influencing operational, maintenance, and ground operations assume accountability in this regard. This entails a comprehensive commitment to vigilantly address and mitigate fatigue-related risks across the spectrum of aviation activities, aligning with industry standards and best practices. This collective responsibility extends to all personnel involved in the pertinent functions, fostering a culture of heightened awareness and proactive measures to ensure optimal safety and performance within the operational framework.

1.4.1 Causes and Consequences of Fatigue

Fatigue is an experience of physical and/or mental tiredness that results in reduced alertness and negatively impacts performance.

The major cause of fatigue is not having obtained adequate rest or recovery from previous activities.

The main causes of fatigue in aviation are:

1. Amount, timing, and quality of sleep each day (sleep/wake schedule).

2. Amount of time since last sleep period (continuous hours awake).

3. Time of day (circadian rhythm).

4. Operations through multiple time zones.

5. Workload and time on task.

In simple terms, fatigue results from inadequate quantity or quality of sleep. There are many consequences of fatigue, and they fall into three major categories:

1. Physical (e.g., abruptly nodding off for a few seconds, called a microsleep),

2. Mental (e.g., lapses in attention), and

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
1.4	OVERVIEW OF FATIGUE RISK MANAGEMENT	**Revision:**	00
		Date:	18-Feb-2024

3.   Emotional (e.g., irritability).

The fatigue associated with tiredness and reduced alertness is different from physical fatigue or weariness that is caused by long and/or hard physical work.

In this case, fatigue may be more accurately defined as mental fatigue although it certainly affects physical performance as well – especially tasks that require mental-physical interactions like hand-eye coordination, and reaction time.

Other skills that are impaired by fatigue include attention, vigilance, concentration, the ability to communicate information clearly and accurately, and decision-making. Impairment can lead to fatigue-related errors, which in turn can lead to incidents or accidents. Incidents and accidents that result from fatigue can be severe and may include fatalities but are most often associated with employee injury and/or equipment damage.

1.4.2   Managing Fatigue Levels

A comprehensive understanding of both the causes and consequences of fatigue is crucial for designing effective systems to manage fatigue-related risks. Unlike physical fatigue, which accumulates and diminishes predictably over time, managing mental fatigue involves addressing different factors. Key factors influencing mental fatigue levels include:

Sleep Quantity and Quality: Inadequate or poor-quality sleep contributes to increased fatigue levels. Both the duration and quality of sleep are critical for recovering from fatigue and maintaining normal alertness and performance.

Time Awake: The duration of wakefulness impacts fatigue levels, with research indicating that alertness and performance decline after a certain number of consecutive wakeful hours.

Circadian Rhythms: Fatigue levels are influenced by the time of day, with early morning presenting a higher risk due to circadian rhythms. Circadian rhythms also affect sleep quality and quantity, as daytime sleep tends to be of lower quality compared to nighttime sleep.

It is important to note that assuming a specific break duration guarantees a particular level of recovery is incorrect. The key factor is the amount and quality of sleep obtained during the time away from work. The timing of a work period within the 24-hour day also plays a crucial role in determining fatigue risk.

Additionally, non-work-related factors such as sleep disorders, family responsibilities, social engagements, leisure activities, and emotional stress can impact both the quantity and quality of sleep obtained. These factors, in turn, affect the duration of wakefulness and contribute to fatigue levels. For Riyadh Air, recognizing and addressing these nuanced aspects of fatigue management is essential for promoting the well-being and performance of its crew members.

FATIGUE RISK MANAGEMENT SYSTEM

1 MANAGEMENT AND CONTROL

1.4 OVERVIEW OF FATIGUE RISK MANAGEMENT

Issue: 00

Revision: 00

Date: 18-Feb-2024

1.4.3 A Risk-Based Approach

Managing fatigue-related risk under a Safety Management System(SMS) framework involves developing comprehensive defenses against the hazard of fatigue based on a formal assessment of risk.

The inherent weaknesses or "holes" in a given safety defense provide opportunities for incident "trajectories" – the series of events and conditions leading to an incident – to penetrate the defense.

An effective FRMS should use multiple, overlapping, and redundant defenses against a given hazard. In a multilayered system, an incident can only occur when all the defensive systems fail. That is, in circumstances where the incident trajectory passes through the holes in each of the defensive layers. The effectiveness of the Corporate Safety Management System (CSMM) can therefore be improved by the appropriate selection of supplementary layers, and/or strengthening individual layers (shrinking the holes).

Investigating incidents also ensures that appropriate hazard controls are put in place at each level of potential risk.

In general, fatigue has traditionally been managed using a single layer of defense (i.e., limits on work hours). The assumption is that compliance with the limits on working hours is evidence that an employee is adequately rested, fit for work, and will not make any fatigue-related errors.

This may not always be the case. Without supplementary defensive layers, it is entirely possible for an employee to comply with working hour limits but to be too tired to work safely.

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
1.5	FATIGUE RISK MANAGEMENT PROCESSES	**Revision:**	00
		Date:	18-Feb-2024

1.5 FATIGUE RISK MANAGEMENT PROCESSES

GACAR PART 5 Appendix G (II)

IOSA FLT 3.4.3(B), 3.4.3(C), CAB 3.1.4(B) & 3.1.4 (C)

1.5.1 Identification of Hazards

Refer CSMSM Section 2.1 for more details on the identification of Hazards.

In FRMS, the identification of fatigue hazards is systematically addressed through the implementation of the following processes:

1.5.1.1 Predictive Process

1.5.1.1.1 Objective

Identify fatigue hazards by scrutinizing scheduling or duty patterns, considering factors influencing sleep, fatigue, and their impact on performance.

1.5.1.1.2 Examination Methods

1. Utilize operator or industry operational experience.

2. Analyze data from similar types of operations.

3. Employ evidence-based scheduling practices.

4. Apply biomathematical models for a comprehensive understanding.

1.5.1.2 Proactive Process

1.5.1.2.1 Objective

Identify fatigue hazards within current operations to proactively address potential risks.

1.5.1.2.2 Examination Methods

1. Encourage self-reporting of fatigue risks.

2. Conduct fatigue surveys for employee input.

3. Analyze relevant employee performance data.

4. Utilize available safety databases and scientific studies.

5. Compare planned versus actual time worked for insights.

FATIGUE RISK MANAGEMENT SYSTEM

1 MANAGEMENT AND CONTROL	**Issue:** 00
	Revision: 00
1.5 FATIGUE RISK MANAGEMENT PROCESSES	**Date:** 18-Feb-2024

1.5.1.3 Reactive Process:

1.5.1.3.1 Objective:

Identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences.

1.5.1.3.2 Minimum Triggers

Initiate the reactive process, triggered by:

1. Fatigue Reports,

2. Confidential reports,

3. Audit reports,

4. Incidents, and

5. Flight data analysis events.

1.5.2 Risk Assessment and Mitigation

For detailed procedure of Risk Assessment and Mitigation, refer to CSMM Section 2.3.

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
		Revision:	00
1.6	FRMS SAFETY ASSURANCE PROCESSES	**Date:**	18-Feb-2024

1.6   FRMS SAFETY ASSURANCE PROCESSES

GACAR PART 5 APPENDIX G (III),

IOSA FLT 3.4.3(B), 3.4.3(C), CAB 3.1.4(B) & 3.1.4 (C)

Safety Assurance Processes are defined in CSMM Section 3.

Safety Assurance Processes in FRMS are meticulously developed and maintained to ensure the continual effectiveness of fatigue safety risk controls.

Riyadh Air's commitment to safety assurance involves a comprehensive approach to:

1.   Monitoring and analyzing FRMS performance on a continuous basis.

2.   Utilizing data from hazard reporting, investigations, audits, surveys, reviews, and fatigue studies.

3.   Implementing a formal process for managing changes in the operational environment and within the Organization.

4.   Considering available tools before implementing changes to maintain or enhance FRMS performance.

5.   Ensuring continuous improvement by evaluating and adjusting risk controls based on their effectiveness and relevance.

6.   Conducting routine evaluations of facilities, equipment, documentation, and procedures.

7.   Responding proactively to emerging fatigue-related risks through the introduction of new processes and procedures.

1.6.1   Continuous FRMS Performance Monitoring and Analysis

1.6.1.1   Objective

Provide continuous monitoring and analysis of FRMS performance to validate the effectiveness of fatigue safety risk controls.

1.6.1.2   Data Sources

1.   Hazard reporting and investigations.

2.   Audits and surveys.

3.   Reviews and fatigue studies.

FATIGUE RISK MANAGEMENT SYSTEM

1 MANAGEMENT AND CONTROL	**Issue:** 00
1.6 FRMS SAFETY ASSURANCE PROCESSES	**Revision:** 00
	Date: 18-Feb-2024

1.6.2 Formal Management of Change Process

1.6.2.1 Identification of Changes

1. Identify changes in the operational environment that may impact FRMS.

2. Identify changes within the organization that may affect FRMS.

1.6.2.2 Formal Process

Follow the formal process for the management of change. as described in CSMSM Section 3.4

1.6.2.3 Tools Consideration

Consider available tools for maintaining or improving FRMS performance before implementing changes.

1.6.3 Continuous Improvement of FRMS

1.6.3.1 Objective

Ensure continuous improvement of the FRMS.

1.6.3.2 Elimination/Modification of Risk Controls

Evaluate and, if necessary, eliminate or modify risk controls with unintended consequences or those no longer needed due to changes in the operational or organizational environment.

1.6.3.3 Routine Evaluations

Conduct routine evaluations of facilities, equipment, documentation, and procedures.

1.6.3.4 Introduction of New Processes and Procedures

Determine the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

1.6.4 Safety Performance Indicators

Fatigue-related Safety Performance Indicators (SPIs) are part of the CSMM. Refer to CSMM Chapter 3.3 for SPIs.

SPIs specific to a FRMS will include measures obtained through FRMS processes, such as:

1. The number of exceeded maximum duty days in operations covered by the FRMS.

2. The number of voluntary Fatigue Reports per month.

3. The average "fatigue call" rate by flight crews on a specific pairing (trip).

FATIGUE RISK MANAGEMENT SYSTEM

1 MANAGEMENT AND CONTROL	**Issue:** 00
1.6 FRMS SAFETY ASSURANCE PROCESSES	**Revision:** 00
	Date: 18-Feb-2024

4. The ratio of Fatigue Reports from operations covered by the FRMS to Fatigue Reports from operations covered by the prescriptive flight and duty time regulations.

5. Attendance at FRMS training sessions.

6. Results on FRMS training assessments.

7. The level of crew member participation in fatigue-related data collection.

8. The number of times fatigue is identified as an organizational factor contributing to an event.

1.7   FRMS DOCUMENTATION AND RECORDS

GACAR PART 5 APP G I(b),

IOSA FLT 3.4.3(B), FLT 3.4.3(C),CAB 3.1.4(B) & 3.1.4 (C)

Riyadh Air is committed to the development and maintenance of the following essential documents within its FRMS.

FRMS Policy Dissemination and Maintenance;

1.   Riyadh Air shall disseminate the FRMS policy to all applicable employees;

2.   Continuous updates and maintenance of the FRMS policy to ensure its relevance and effectiveness;

FRMS Processes for Operating Departments;

1.   Each operating department is responsible for maintaining FRMS processes for reporting and investigation;

2.   Operating departments must define processes to raise awareness of FRMS within their respective areas;

Accountabilities and Responsibilities Definition;

Riyadh Air shall clearly define the responsibilities and authority of personnel within each operating department. This information will be documented in the respective operating department manual.

FRMS Training Record:

Refer to FRMS Chapter 2 for details on FRMS training records.

Duty Time Limitations:

1.   For Flight Crew and Cabin Crew: Refer to FRMS Section 3.1.

2.   For Maintenance Personnel: Refer to FRMS Section 3.2.

3.   For Dispatchers: Refer to FRMS Section 3.3.

1.7.1   FRMS Records

In addition to the FRMS Manual, Riyadh Air's FRMS documentation includes the following supplementary documents:

1.   Rosters and Flight Time (Scheduled and Actual).

2.   Flight Duty Records.

3.   Documentation of Duty Periods and Off-Duty Periods.

4.   Fatigue and Incident Reports, and associated investigation documents.

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
1.7	FRMS DOCUMENTATION AND RECORDS	**Revision:**	00
		Date:	18-Feb-2024

5. Agendas and minutes of the Fatigue Safety Action Group (FSAG) meetings and related discussions.

6. Fatigue Surveys, submissions, or other Fatigue Risk Management (FRM) input.

7. Training and Competency Records, including syllabi, instructor feedback, and course feedback.

8. Hazard Identification and Risk Assessment Records.

9. Operations Notices, Bulletins, Newsletters, etc., referencing fatigue-related matters.

10. Reports of Extensions, Diversions, and similar occurrences.

11. Audit Reports and FRMS Records.

12. Fatigue or safety-related data collection and analysis.

1.7.2   Retention

All documents and records pertaining to the FRMS are to be retained by Riyadh Air for a minimum of five years from the date of the record. Furthermore, these records must be made available to GACA upon request.

FATIGUE RISK MANAGEMENT SYSTEM

1 MANAGEMENT AND CONTROL	**Issue:**	00
1.8 FATIGUE REVIEW COMMITTEE	**Revision:**	00
	Date:	18-Feb-2024

1.8 FATIGUE REVIEW COMMITTEE

The SAG committed platform shall also be used as the Fatigue Review Committee (FRC) and one of the agenda items for SAG meetings to review and discuss fatigue reports.

Refer CSMM 1.4.3 for detailed SAG meeting procedure.

FATIGUE RISK MANAGEMENT SYSTEM

1	MANAGEMENT AND CONTROL	**Issue:**	00
1.9	PROTECTION OF PRIVACY	**Revision:**	00
		Date:	18-Feb-2024

1.9 PROTECTION OF PRIVACY

Creating an atmosphere of open communication is imperative at Riyadh Air, fostering an environment that aids crew members in upholding the highest safety standards. The information obtained from reviewing reports is instrumental in developing educational initiatives to promote the health and well-being of crew members.

Employees adhering to the FRMS at Riyadh Air receive confidential protection and a non-punitive environment, consistent with the Company's safety reporting culture, while prioritizing flight safety. The personal information derived from a crew member's online Fatigue Report is strictly confidential and remains undisclosed outside the Company.

FATIGUE RISK MANAGEMENT SYSTEM

1   MANAGEMENT AND CONTROL

1.10   SMS and FRMS

Issue: 00

Revision: 00

Date: 18-Feb-2024

1.10   SMS AND FRMS

SMS Framework	FRMS
Safety Policy and Objectives	FRMS Policy and Documentation
Safety Risk Management	FRM processes: 1. Identification of Hazards. 2. Risk assessment. 3. Risk mitigation.
Safety Assurance	FRMS safety assurance processes: 1. FRMS performance monitoring. 2. Management of operational and organizational change. 3. Continuous FRMS improvement.
Safety Promotion	FRMS promotion processes: 1. Training Programs. 2. FRMS communication plan.

Table 1 SMS Framework and FRMS

1.10.1   FRMS Safety Objective

The objective of Riyadh Air's FRMS is to define and document policies and procedures in an attempt to identify and mitigate the risks imposed by fatigue on flight crew, and other employees who may affect flight safety.

The program includes training modules that facilitate the identification of fatigue. It is expected that if fatigue issues are addressed and analyzed, risk will decrease. Additional operational benefits in productivity should result from proactive scheduling and mitigation procedures.

FATIGUE RISK MANAGEMENT SYSTEM

2	TRAINING AND EDUCATION	**Issue:**	00
2.1	DETERMINING TRAINING NEED	**Revision:**	00
		Date:	18-Feb-2024

2 TRAINING AND EDUCATION

GACAR PART 5 Appendix G (IV),

IOSA FLT 3.4.3(B), 3.4.3(C), CAB 3.1.4(B) & 3.1.4 (C)

2.1 DETERMINING TRAINING NEED

There are three main factors to consider when designing and implementing an FRMS Training Program:

1. The level of existing knowledge and awareness.

2. The level of fatigue-related risk.

3. Requirement of resources.

Training is an essential component of a Fatigue Risk Management System.

Before designing and implementing a training program, Riyadh Air shall determine the level and method of training required. A risk assessment of the various work tasks and the work environment also helps in developing the program.

FATIGUE RISK MANAGEMENT SYSTEM

2   TRAINING AND EDUCATION

2.2   FATIGUE MANAGEMENT EDUCATION AND TRAINING

Issue: 00

Revision: 00

Date: 18-Feb-2024

2.2   FATIGUE MANAGEMENT EDUCATION AND TRAINING

2.2.1   Initial and Recurrent Training

The Initial and Recurrent programs will include the following subject areas:

1.   Review of crew member duty and rest regulatory requirements.

2.   Review Riyadh Air policies and procedures related to fatigue to encourage crew member understanding and participation in the FRMS.

3.   Basics of fatigue.

4.   Causes and awareness of fatigue.

5.   Effects of operating through multiple time zones.

6.   Effects of fatigue relative to crew member performance.

7.   Fatigue countermeasures, prevention, and mitigation.

8.   Influence of lifestyle on fatigue.

9.   Familiarity with sleep disorders.

10.   Effects of commuting on fatigue.

11.   Crew member responsibility for ensuring adequate rest and fitness for duty.

12.   Operational procedures to follow when fatigue is identified.

13.   Methodology for assessing effectiveness of fatigue training.

14.   Lessons learned.

15.   Proper reporting.

2.2.1.1   Training Topic: Flight Crew and Cabin Crew

Review of GACA flight, duty, and rest regulatory requirements:

1.   Review of applicable Sections of parts 91, 117, and 121,

2.   Review of safety recommendations regarding fatigue, and

3.   Effects of fatigue on flight operations.

Awareness of Riyadh Air's FRMS:

1.   Flight time, duty, and rest schemes consistent with limitations.

2.   Fatigue reporting policy, procedures, and processes.

FATIGUE RISK MANAGEMENT SYSTEM

2 TRAINING AND EDUCATION	**Issue:** 00
2.2 FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:** 00
	Date: 18-Feb-2024

RIYADH AIR
طيران الرياض

3. Fatigue mitigation policies and procedures, and responsibilities of management and employees to mitigate or manage the effects of fatigue and improve crew member flight deck alertness.

The basics of fatigue, including sleep fundamentals and circadian rhythms:

1. Basic terms and definitions related to the science of fatigue,

2. Basic sleep fundamentals,

3. Overview of circadian rhythms, and

4. Signs and symptoms of fatigue.

Awareness of the causes of fatigue:

1. Shift work,

2. Workload,

3. Cumulative duty,

4. Time zone changes, and

5. Illness and stress.

The effects of operating through multiple time zones:

1. Sleep phase shift,

2. Circadian rhythm disruption ("jetlag"),

3. Operations in westerly directions,

4. Operations in easterly directions, and

5. Acclimation.

The effects of fatigue relative to pilot performance:

1. Judgment error,

2. Loss of situational awareness/reduced attention,

3. Degradation of performance,

4. Increased reaction time, and

5. Diminished memory.

Fatigue countermeasures, prevention, and mitigation:

1. Prevention,

2. Adequate rest,

3. Nutrition,

FATIGUE RISK MANAGEMENT SYSTEM

2	TRAINING AND EDUCATION	**Issue:**	00
2.2	FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:**	00
		Date:	18-Feb-2024

4. Mitigation,

5. Rest management,

6. Rest facilities, and

7. Suitable accommodation.

The influence of lifestyle, including nutrition, exercise, and family life on fatigue:

1. Nutrition,

2. Exercise,

3. Hydration,

4. Family life,

5. Caffeine and stimulants, and

6. Alcohol use.

Familiarity with sleep disorders:

1. Insomnia,

2. Sleep apnea, and

3. Restless leg syndrome.

The effects of fatigue as a result of commuting:

1. Responsible commuting and good commuting practices,

2. Being properly rested prior to beginning a duty assignment,

3. Travel delays, and

4. Lack of adequate rest.

Crew responsibility for ensuring adequate rest and fitness for duty:

1. Crew member responsibility,

2. Obtaining quality rest,

3. Personal strategies for preventing and managing fatigue risk,

4. Responsibility to report fatigue, and

5. Fatigue recognition, personal assessment of fatigue, and identifying signs of fatigue in others.

Riyadh Air's responsibility for ensuring adequate rest and fitness for duty:

1. Responsibility in accordance with GACAR 117,

2. Fatigue Reporting Procedures,

FATIGUE RISK MANAGEMENT SYSTEM

2 TRAINING AND EDUCATION	**Issue:** 00
2.2 FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:** 00
	Date: 18-Feb-2024

3. Actions to be taken in the event of a Fatigue Report, and

4. Scheduling practices.

2.2.1.2 Training Topic: Maintenance Personnel

Introduction to FRMS Structure and Shared Responsibility:

1. Understanding the organizational FRMS structure.

2. Emphasizing shared responsibility in fatigue management.

3. Highlighting the role of effective reporting in maintaining a robust FRMS.

Responsibilities in FRMS:

1. Clarifying individual and service provider responsibilities.

2. Stressing adherence to FRMS policies and procedures.

3. Integrating FRMS seamlessly into daily maintenance operations.

Scientific Principles of FRMS:

1. Introducing the scientific foundations of fatigue.

2. Exploring the interplay of sleep, circadian rhythms, and fatigue.

3. Connecting scientific principles to informed FRMS strategies.

Causes and Consequences of Fatigue:

1. Identifying common fatigue triggers in maintenance operations.

2. Examining the impact of fatigue on safety, performance, and wellbeing.

3. Illustrating real-world scenarios through case studies.

FRM Processes and Role in Mitigations:

1. Defining maintenance personnel's role in FRM processes.

2. Emphasizing effective use of Fatigue Reporting Systems.

3. Implementing and actively participating in fatigue mitigations.

Importance of Accurate Fatigue Data:

1. Stressing the significance of both subjective and objective fatigue data.

2. Providing best practices for reporting and documenting fatigue issues.

3. Analyzing fatigue data trends for continuous improvement.

Identifying Fatigue in Self and Others:

1. Recognizing signs and symptoms of personal fatigue.

FATIGUE RISK MANAGEMENT SYSTEM

2 TRAINING AND EDUCATION	**Issue:** 00
2.2 FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:** 00
	Date: 18-Feb-2024

2. Addressing fatigue in team members proactively.

3. Fostering a culture of open communication about fatigue.

Personal Strategies for Sleep Improvement:

1. Offering practical strategies for enhancing sleep quality at home.

2. Encouraging the development of personalized sleep routines.

3. Minimizing fatigue risk during duty hours through individual strategies.

Sleep Disorders and Treatment:

1. Exploring common sleep disorders relevant to maintenance personnel.

2. Guiding on where to seek help for sleep disorders.

3. Highlighting requirements and considerations for fitness for duty.

2.2.1.3 Training Topic: Aircraft Dispatchers and Ground Operations Personnel

FRMS Structure and Collective Responsibility in Aviation:

1. Comprehending the intricate FRMS architecture within the aviation organization.

2. Emphasizing shared responsibility for fatigue management, a cornerstone for effective aviation operations.

3. Recognizing the pivotal role of precise reporting in upholding a robust FRMS, specifically tailored for aircraft dispatchers and ground operations.

Responsibilities in FRMS for Aviation Professionals:

1. Clarifying distinctive individual and organizational responsibilities within the context of FRMS.

2. Underlining the critical importance of adherence to meticulous FRMS policies and procedures in aviation operations.

3. Integrating FRMS seamlessly into the daily workflow of aircraft dispatchers and ground operations personnel.

Scientific Principles of FRMS in Aviation:

1. Introducing the intricate scientific underpinnings of fatigue directly applicable to aviation.

2. Investigating the profound impact of sleep, circadian rhythms, and fatigue within operational aviation settings.

3. Causes and consequences of fatigue in aviation operations

4. Discerning common fatigue triggers prevalent in aircraft dispatch and ground operations.

FATIGUE RISK MANAGEMENT SYSTEM

2	TRAINING AND EDUCATION	**Issue:** 00
2.2	FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:** 00
		Date: 18-Feb-2024

FRM Processes and Specialized Roles in Mitigations for Dispatchers:

1. Defining the distinctive roles that aircraft dispatchers personnel play in FRM processes.

2. Accentuating the effective utilization of Fatigue Reporting Systems in the dynamic realm of aviation operations.

3. Implementing and actively participating in fatigue mitigations tailored to the specialized roles of dispatchers .

Significance of Accurate Fatigue Data in the Aviation Domain:

1. Underscoring the critical importance of both subjective and objective fatigue data within the aviation context.

2. Providing impeccable best practices for reporting and documenting fatigue-related issues unique to aviation settings.

Tailored Personal Strategies for Sleep Enhancement in Aviation:

1. Offering practical strategies designed for enhancing sleep quality tailored to aircraft dispatcher ops personnel.

2. Encouraging the development of personalized sleep routines, considering the unique challenges posed by the aviation industry.

3. Minimizing fatigue risk during duty hours through individual strategies finely tuned to the specific roles within aviation.

4. Exploring common sleep disorders with direct relevance to aircraft dispatcher personnel.

5. Guiding on where to seek assistance for sleep disorders, specifically within the aviation industry.

2.2.1.4 Training Topic: Personnel involved in schedule (roster) design and management

An overview of the FRMS structure and how it works in the service provider's organization, including the concepts of shared responsibility and encouraging effective reporting.

The scientific principles that underpin FRMS:

1. How scheduling affects sleep opportunities and can disrupt the circadian biological clock cycle, the fatigue risk that this creates, and how it can be mitigated through scheduling.

2. Use and limitations of any scheduling tools and biomathematical models or other algorithms that may be used to predict the levels of an individual's fatigue across rosters/schedules.

3. Their role in the FRMS in relation to fatigue hazard identification and risk assessment.

Processes and procedures for planned schedule changes, including:

1. Assessing the potential fatigue impact of planned changes.

FATIGUE RISK MANAGEMENT SYSTEM

2 TRAINING AND EDUCATION	**Issue:** 00
2.2 FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:** 00
	Date: 18-Feb-2024

2. Early engagement of the FSAG in the planning of changes with significant potential to increase fatigue risk.

3. Implementing changes recommended by the FSAG.

4. How to identify fatigue in themselves and others.

5. Personal strategies that they can use to improve their sleep at home and to minimize their own fatigue risk, and that of others, while they are at work.

6. Basic information on sleep disorders and their treatment, and where to seek help if needed.

2.2.1.5 Training Topic: Decision-Makers and Operational Risk Managers

1. Overall understanding of the scientific principles that underpin FRMS and the safety risk that fatigue represents to the organization.

2. Overview of the FRMS structure and how it works, including the concepts of shared responsibility and an effective reporting culture, and the role of the FSAG.

3. Responsibilities and accountabilities of different stakeholders in the FRMS, including themselves.

4. Overview of the types of fatigue mitigation strategies being used by the organization.

5. FRMS safety assurance metrics used by the organization.

6. Linkages between the FRMS and other parts of the Service Provider's Safety Management System.

7. Linkages between the FRMS and other parts of the organization, for example the Scheduling Department, operational sections, Medical Department, Safety Department, etc.

8. Regulatory requirements for the FRMS.

9. How to identify fatigue in themselves and others.

10. Personal strategies to improve their sleep at home and to minimize their own fatigue risk, and that of others, while they are at work.

11. Basic information on sleep disorders, their treatment, and where to seek help if needed, so they can make organizational decisions about how to manage affected individuals.

FATIGUE RISK MANAGEMENT SYSTEM

2 TRAINING AND EDUCATION	**Issue:** 00
2.2 FATIGUE MANAGEMENT EDUCATION AND TRAINING	**Revision:** 00
	Date: 18-Feb-2024

2.2.2 Training Mode and Duration

2.2.2.1 Medium

The theoretical training module may be dispensed through a diverse array of techniques and media to facilitate learning:

1. Conventional classroom settings,

2. Virtual classrooms,

3. Web-based platforms,

4. Digital resources, and

5. Video tutorials.

2.2.2.2 Duration

1. Initial training duration will be 04 hours for each employee.

2. Recurrent training duration will be 02 hours for each employee.

FATIGUE RISK MANAGEMENT SYSTEM

2   TRAINING AND EDUCATION

2.3   FATIGUE MANAGEMENT TRAINING AND EDUCATION OUTCOMES

Issue:	00
Revision:	00
Date:	18-Feb-2024

2.3   FATIGUE MANAGEMENT TRAINING AND EDUCATION OUTCOMES

On completion of training, it is expected that:

1.   Employees know and understand the organization's fatigue management policies and procedures.

2.   Managers and employees know and understand their responsibilities in managing fatigue.

3.   Personnel know how to identify and manage risks associated with fatigue at both a personal and organizational level.

4.   Those responsible for decisions influencing sleep opportunities for employees know and understand their responsibilities and implement appropriate fatigue-reduction strategies where necessary.

5.   Training records have been created and stored in an appropriate place.

FATIGUE RISK MANAGEMENT SYSTEM

2 TRAINING AND EDUCATION	**Issue:** 00
2.4 FRMS COMMUNICATION	**Revision:** 00
	Date: 18-Feb-2024

2.4   FRMS COMMUNICATION

IOSA FLT 3.4.3(B), 3.4.3(C), CAB 3.1.4(B) & 3.1.4 (C)

Communication from crew members are essential for fatigue hazard identification, for feedback on the effectiveness of controls and mitigations, and in providing information for FRMS SPIs.

For these communications to be open, all FRMS stakeholders need to have a clear understanding of the policies governing data confidentiality and the ethical use of information provided by crew members. There also needs to be clarity about the thresholds that separate non-culpable fatigue-related safety events from deliberate violations that will attract penalties.

The Riyadh Air communication program is capable of supporting and continuously improving all elements of the FRMS in delivering the optimum safety level.

For the FRMS communication to be effective, it should not only explain all elements of the FRMS to management, flight crew members, and all other relevant personnel, but also describe the communication channels that must be used to gather, disseminate, and apply FRMS-related information.

To achieve this outcome, the FRMS communication should address the following requirements:

1.   The confidential nature of communication from and by crew (reports, surveys etc.) and the data gleaned from such activity.

2.   Ethical use of information and data from crew communications.

3.   All Fatigue Reports are responded to ensure that the reporter has confirmation the report has been received.

4.   All Fatigue Reports subject to any level of enquiry or investigation result in the generation of a further response to the reporter upon at the completion of the enquiry/investigation processes to summarize any relevant actions and/or findings.

5.   The minutes of FSAG are made available to all stakeholders.

6.   Accurate, concise, and timely FRMS publications about fatigue and the activities and safety performance of the FRMS are:

7.   Developed and disseminated to all stakeholders.

8.   Endorsed by the Accountable Manager.

9.   Produced regularly to ensure fatigue issues are brought to the attention of stakeholders.

10.   Appropriately focused to ensure fatigue messages are not obscured by other information.

11.   Relevant, containing information about recent fatigue events, hazards and/or investigations to demonstrate the need for vigilance.

12.   Method to assess the uptake/readership/effectiveness of the messages and messaging system.

FATIGUE RISK MANAGEMENT SYSTEM

2	TRAINING AND EDUCATION	**Issue:**	00
2.4	FRMS COMMUNICATION	**Revision:**	00
		Date:	18-Feb-2024

2.4.1 FRMS Circular

Each operating department is required to distribute a quarterly newsletter or circular to all employees. These communications will address key topics, including but not limited to fatigue awareness, fatigue reporting procedures, fatigue policy updates, fatigue prevention measures, and fatigue risk mitigation strategies.

FATIGUE RISK MANAGEMENT SYSTEM

3	FLIGHT DUTY TIME LIMITATION AND SCHEDULING	**Issue:**	00
3.1	FLIGHT CREW AND CABIN CREW DUTY TIME LIMITATIONS	**Revision:**	00
		Date:	18-Feb-2024

3 FLIGHT DUTY TIME LIMITATION AND SCHEDULING

3.1 FLIGHT CREW AND CABIN CREW DUTY TIME LIMITATIONS

GACAR PART 117

3.1.1 Duty Time Limitations

For Flight Crew, Refer to OM-A Section 7

For Cabin Crew, Refer to OM-E Section 1.2.6

3.1.2 Rest Requirements

Refer to OM-A Section 7

3.1.3 Crew Scheduling Actions

When a crew member communicates fatigue to Crew Scheduling, the flight crew/cabin crew will be promptly removed from their schedule and placed on a mandatory ten (10) hour rest period. The Crew Scheduler will then escalate the matter to the Chief Pilot/Director Cabin Crew, who will provide the necessary support to the flight crew/cabin crew.

If the crew member is away from their base location, they will be accommodated at a local contracted hotel.

The Chief Pilot/Director Cabin Crew will advise the crew member concerned to submit a notification to the Safety Department via a Fatigue Report.

FATIGUE RISK MANAGEMENT SYSTEM

3	FLIGHT DUTY TIME LIMITATION AND SCHEDULING	**Issue:**	00
3.2	MAINTENANCE AND PREVENTIVE MAINTENANCE PERSONNEL DUTY TIME LIMITATIONS	**Revision:**	00
		Date:	18-Feb-2024

3.2 MAINTENANCE AND PREVENTIVE MAINTENANCE PERSONNEL DUTY TIME LIMITATIONS

GACAR PART 121.1033

Refer to GMM Section 1.11.

FATIGUE RISK MANAGEMENT SYSTEM

3	FLIGHT DUTY TIME LIMITATION AND SCHEDULING	**Issue:**	00
3.3	AIRCRAFT DISPATCHER DUTY TIME LIMITATIONS	**Revision:**	00
		Date:	18-Feb-2024

3.3 AIRCRAFT DISPATCHER DUTY TIME LIMITATIONS

GACAR PART 121.1033

Refer to Operations Manual Part-G Section

FATIGUE RISK MANAGEMENT SYSTEM

3   FLIGHT DUTY TIME LIMITATION AND SCHEDULING

3.4   FATIGUE AVOIDANCE SCHEDULING TOOL

Issue:	00
Revision:	00
Date:	18-Feb-2024

3.4   FATIGUE AVOIDANCE SCHEDULING TOOL

Riyadh Air uses the Lufthansa Systems 'Netline Crew' system for crew pairing, rostering, and tracking. Netline Crew employs the FRMS SAFE biomathematical fatigue model to predict fatigue hazards experienced by commercial airline crew.

The algorithm calculates fatigue values for each assigned duty event and each duty event of a pairing in open time. Fatigue levels at the beginning and the end of the duty event are determined as well as the point in time and level of maximum fatigue during the event. Values are then displayed in a crew member's roster as well as in unassigned pairings via gradient colors.

FATIGUE RISK MANAGEMENT SYSTEM

3   FLIGHT DUTY TIME LIMITATION AND SCHEDULING

3.5   PROACTIVE ROSTERING

Issue:	00
Revision:	00
Date:	18-Feb-2024

3.5   PROACTIVE ROSTERING

Riyadh Air will employ proactive scheduling policies, as detailed in OM-A Section 7, to create favorable conditions for the flight crew members, allowing them to obtain sufficient rest and ensuring their readiness to successfully fulfill assigned missions.

Proactive rostering also encompasses the implementation of realistic schedules, subject to ongoing reviews, to guarantee that flights consistently adhere to their planned timetables.

FATIGUE RISK MANAGEMENT SYSTEM

3	FLIGHT DUTY TIME LIMITATION AND SCHEDULING	**Issue:**	00
3.6	FATIGUE ANALYSIS METHODS	**Revision:**	00
		Date:	18-Feb-2024

3.6 FATIGUE ANALYSIS METHODS

3.6.1 Retrospective (Reactive) Process

Riyadh Air shall use a science-based fatigue model to assess the estimated fatigue levels associated with current or past schedules and determine which schedules are more vulnerable to increased fatigue levels and reductions in performance.

First, Riyadh Air identifies those schedules (both trip sequences and monthly pilot schedules) that have been associated with the greatest levels of fatigue. Next, Riyadh Air can derive the fatigue factors present and examine the potential for schedule changes to reduce fatigue.

Such changes might include additional layover days, additional recovery days, augmented crews to permit in-flight sleep opportunities, or rescheduled block times to avoid critical tasks at times during or near the WOCL.

3.6.2 Prospective (Proactive) Process

Riyadh Air can also assess proposed schedules for potential fatigue impact by using the method described above. Trip sequences that have been identified as leading to acute and chronic fatigue can be removed or modified to prevent the accumulation of fatigue across a bid schedule. This shall be embedded into the schedule creation process to avoid those conditions that, according to the fatigue model, could lead to excessive fatigue risk.

FATIGUE RISK MANAGEMENT SYSTEM

3   FLIGHT DUTY TIME LIMITATION AND SCHEDULING

3.7   IDENTIFICATION AND MANAGEMENT OF AVIATION FATIGUE DRIVERS

Issue:	00
Revision:	00
Date:	18-Feb-2024

3.7   IDENTIFICATION AND MANAGEMENT OF AVIATION FATIGUE DRIVERS

Many operational factors contribute to fatigue in any aviation setting. Riyadh Air shall effectively address and mitigate fatigue risk in operations by managing the following common factors:

1.   Crew flight and duty periods, along with strategically planned rest breaks, to minimize fatigue.

2.   Additional duties assigned to flight crews, which may further limit opportunities for adequate sleep.

3.   Schedule changes that extend duties beyond the originally published schedule.

4.   Consideration of the duration and timing of layovers between successive flight segments.

5.   Ensuring that there are sufficient recovery days following a trip, allowing enough sleep to eliminate any accumulated sleep debt before scheduling additional flight duties.

6.   Optimal utilization of available rest opportunities to promote overall crew well-being.

FATIGUE RISK MANAGEMENT SYSTEM

3	FLIGHT DUTY TIME LIMITATION AND SCHEDULING	**Issue:** 00
3.7	IDENTIFICATION AND MANAGEMENT OF AVIATION FATIGUE DRIVERS	**Revision:** 00
		Date: 18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.1	FATIGUE REPORT POLICY	**Revision:**	00
		Date:	18-Feb-2024

4 FATIGUE REPORT MANAGEMENT

4.1 FATIGUE REPORT POLICY

The Fatigue Policy and Fatigue Reporting System are designed to encourage reporting of fatigue-related events. The accuracy and reliability of fatigue-related data, as well as the identification of root causes of fatigue impairment, depend on the quality of information obtained from crew members. Therefore, any crew members reporting personal information will be treated in a non-punitive manner. The Company's Safety Reporting System uses a web-based reporting application that provides the capability to submit a Fatigue Report from any internet-capable device.

Crew members and other employees are required to report all cases of fatigue-related risk, errors, and incidents to their immediate supervisor, or the Director of Safety. The supervisor will act accordingly, depending on the severity of the case. This may include (but is not limited to) advising the employee to self-monitor performance, allocating peer/management supervision to the employee, task reassignment, or sending the employee home.

The purpose of this database is to collect information on the frequency with which employees are provided with insufficient sleep opportunities (due to overtime or contingency situations), obtain insufficient sleep; exhibit fatigue-related symptoms; or make a non-consequence error that may have been fatigue-related. Although employees are required to provide their name, this will only be used by the Safety Manager if more information is required. The intent is purely data collection, and the information will not be used for disciplinary purposes.

FATIGUE RISK MANAGEMENT SYSTEM

4 FATIGUE REPORT MANAGEMENT	**Issue:** 00
4.2 FATIGUE REPORTING	**Revision:** 00
	Date: 18-Feb-2024

4.2 FATIGUE REPORTING

Fatigue Reports play a vital role in supporting Riyadh Air's Safety Management System by conveying safety and operational concerns to the organization for thorough review and potential action. Riyadh Air fosters a non-punitive environment that encourages good faith reporting, where crew members are expected to report threats and errors without fear of retribution.

For further details on reporting process refer to CSMM, Section 2.2.2.

4.2.1 Reporting Parameter

4.2.1.1 Flight Crew and Cabin Crew

A Fatigue Report can be raised by any crew member for issues (mentioned below) which are seen as potential hazards or contributing factors to safety related accidents, incidents, and events.

Crew member shall submit a fatigue report via IQSMS under the following conditions:

1. **Crew Member Fatigue – Retrospective**: Allows crew members to reflect on past experiences of fatigue, providing Riyadh Air with the opportunity to review similar operations for fatigue. This aids flight operations in determining safe guidance for future operations.

5. **Crew Member Fatigue – Proactive**: Enables fatigued crew members to report their inability to continue their current assignment. In a Just Culture, employees are responsible for showing up rested and capable of completing their assignments. In this culture, it is assumed that the assignment or associated circumstances are responsible for the fatigue.

6. **Crew Member Fatigue – Incident Reporting**: Permits crew members to report violations of company policy. If reported in good faith, this report will not be used for disciplinary action against the crew member. Riyadh Air, however, cannot waive its regulatory duties and must report such actions to the GACA.

7. **Crew Member Fatigue – Incident Mandatory**: Required in the event of an accident, incident, or significant event. This report is utilized to assess the fatigue-related contributing factors to the accident, incident, or event.

4.2.1.2 Maintenance Personnel, Aircraft Dispatchers and Ground Operations Personnel

Personnel covered under this section can submit a fatigue report via IQSMS under the following conditions:

1. **Fatigue – Current Operation**: Maintenance Personnel, Aircraft Dispatchers and Ground Operations Personnel may report fatigue while performing an extended duty or shift.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:** 00
4.2	FATIGUE REPORTING	**Revision:** 00
		Date: 18-Feb-2024

2. **Fatigue – Retrospective**: Allows Maintenance Personnel, Aircraft Dispatchers and Ground Operations Personnel to reflect on past experiences of fatigue, providing Riyadh Air with the opportunity to review similar operations for fatigue. This aids flight operations in determining safe guidance for future operations.

3. **Fatigue – Incident Reporting**: Permits crew members to report violations of company policy. If reported in good faith, this report will not be used for disciplinary action against the crew member. Riyadh Air, however, cannot waive its fiduciary duties and must report such actions to the Administrator.

4. **Fatigue – Incident Mandatory**: Required in the event of an accident, incident, or significant event. This report is utilized to assess the fatigue-related contributing factors to the accident, incident, or event.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.3	FATIGUE REPORT INVESTIGATION	**Revision:**	00
		Date:	18-Feb-2024

4.3   FATIGUE REPORT INVESTIGATION

Riyadh Air has established a comprehensive fatigue investigation process aimed at identifying causal and contributing factors to incidents related to fatigue. The outcomes of this process are integral to enhancing reactive hazard identification procedures. The investigation process ensures:

1. Formal review of all fatigue events/incident reports and other relevant reports where fatigue may be identified, based on predetermined thresholds established through the risk assessment process. These thresholds facilitate the identification of fatigue events/incidents for investigation, specifying the level of investigation required.

2. Adherence to the Corporate Safety Management Manual (CSMM) in the fatigue incident reporting and investigation process, conducted by individuals with appropriate training. The reporting and investigation process encompasses:

   a. Fatigue Report.

   b. Inclusion of specialist assistance when needed; for instance, a Subject Matter Expert in flight data analysis may be engaged to assist with investigations involving considerations of traces depicting a Flight Data Analysis Program (FDAP) event.

Upon receiving a Fatigue Report from a crew member, the Safety Department promptly forwards the report to the relevant department within 24 hours.

Each Fatigue Risk Management System (FRMS) report accepted by the Safety Department undergoes analysis by the operating department, utilizing Hazard Analysis and Risk Acceptance procedures as outlined in the CSMM. Root Cause Analysis (RCA) is conducted for each identified hazard.

Crew Member Fatigue – Retrospective

A retrospective report shall be filed when a crew member realizes their performance has been degraded, but no aggravating circumstance has occurred. Reports of this nature will be reviewed and analyzed in a timely manner.

Crew Member Fatigue – Proactive

When a crew member feels that fatigue shall interfere with their ability to complete their assignment, this crew member shall file a FRMS report. This report shall be analyzed immediately by an appropriate level of management. The crew member shall be removed from further duty and placed into rest. Analysis shall consider whether other members of the crew are similarly fatigued.

Crew Member Fatigue – Incident Reporting

When a crew member feels that fatigue has led to an incident, accident, or event involving failure to comply with GACAR or Company Procedures, this individual shall file a Fatigue Report. This report shall be analyzed in conjunction with the other contributing factors in the investigation of the accident, incident, or event.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.3	FATIGUE REPORT INVESTIGATION	**Revision:**	00
		Date:	18-Feb-2024

Crew Member Fatigue – Incident Mandatory

Whenever an accident, incident, or event requiring Company investigation occurs, the crew members involved shall all file Fatigue Reports and assist in the Root Cause Analysis process. Reports of this nature shall be requested by management or GACA, if not submitted at the time of the accident or incident.

4.3.1.1 Maintenance Personnel, Aircraft Dispatchers and Ground Operations Personnel

Fatigue – Current Operation: The immediate supervisor or manager is responsible for taking action based on the employee's report. This may involve assigning the employee a different task or altering their role as deemed appropriate through the supervisor's assessment. These actions should be documented and reported in the fatigue database.

Fatigue – Retrospective: An employee should submit a retrospective report when they recognize a degradation in performance without the presence of any aggravating circumstances. Such reports will be promptly reviewed and analyzed.

Fatigue – Incident Reporting: In the event that a crew member believes fatigue played a role in an incident, accident, or any occurrence involving a failure to adhere to GACAR or Company Procedures, they are required to submit a Fatigue Report. This report will be examined alongside other contributing factors during the investigation of the accident, incident, or event.

Fatigue – Incident Mandatory: In the event of an accident, incident, or any occurrence necessitating a Company investigation, the involved employee is obligated to submit Fatigue Reports and actively participate in the Root Cause Analysis process. Management or GACA may request these reports if not initially provided at the time of the accident or incident.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.3	FATIGUE REPORT INVESTIGATION	**Revision:**	00
		Date:	18-Feb-2024

4.3.2   Fatigue Risk Assessment

After receiving Fatigue Reports, Flight Operations shall conduct Fatigue Risk Assessment for each report.

The FRMS risk assessment procedures shall ensure fatigue-related hazards are examined in relation to their context determining the probability, and the possible consequences of the hazards with the consideration of the effectiveness of existing controls.

The Risk assessment process shall follow Riyadh Air CSMM chapter ???

Risk Assessment shall include considering the fatigue hazard in the relevant operational context with the existing procedures.

Based on assessment, Riyadh Air shall select appropriate mitigation strategies for each fatigue hazard, implement the mitigation strategies, and monitor the effectiveness of the implemented mitigations.

Figure 1 below displays an example of the decision-making steps that Riyadh Air may take in the risk assessment process.
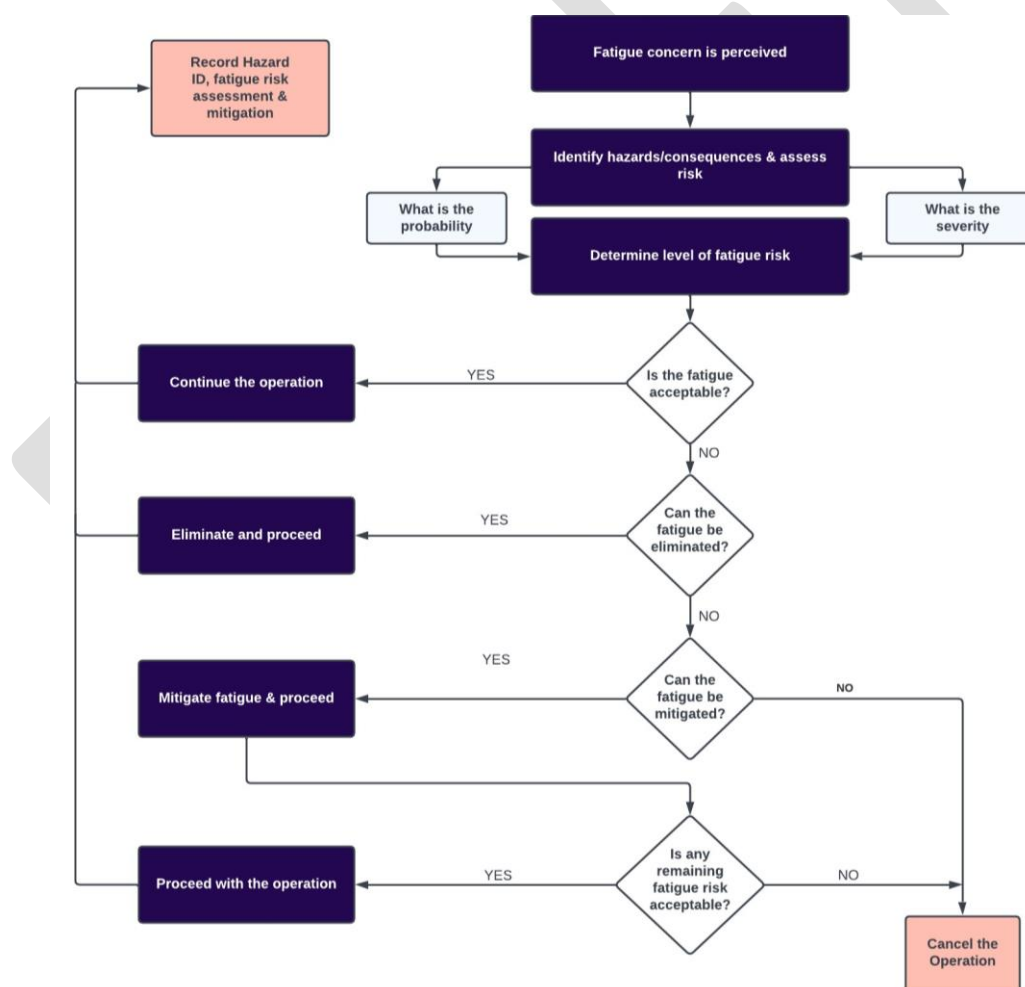

Figure 1 – Fatigue Risk Assessment Process

FATIGUE RISK MANAGEMENT SYSTEM

4 FATIGUE REPORT MANAGEMENT	**Issue:** 00
4.4 FATIGUE REPORT ROOT CAUSE AND ANALYSIS	**Revision:** 00
	Date: 18-Feb-2024

4.4 FATIGUE REPORT ROOT CAUSE AND ANALYSIS

The operating department at Riyadh Air is required to submit the investigation report to the Safety Department within a period of seven days upon receipt of a Fatigue Report. The investigation report should encompass a comprehensive determination of the root cause and analysis of the Fatigue Report, along with providing appropriate recommendations for mitigation and improvement. This ensures a swift and thorough examination of fatigue-related incidents, contributing to the continual enhancement of our safety protocols and standards.

FATIGUE RISK MANAGEMENT SYSTEM

4 FATIGUE REPORT MANAGEMENT	**Issue:** 00
4.5 CONTINUOUS IMPROVEMENT	**Revision:** 00
	Date: 18-Feb-2024

4.5   CONTINUOUS IMPROVEMENT

Riyadh Air's Safety database is responsible for archiving Fatigue Reports, capturing data that includes fleet details, routes, and the frequency of occurrences. This information is systematically analyzed to assess the effectiveness of the Fatigue Risk Management System (FRMS). The annual summary reporting incorporates identified trends, facilitating a comprehensive evaluation of the FRMS' effectiveness.

Every Corrective Action Plan must incorporate a subsequent report analysis. This analysis is essential for determining the efficacy of the mitigation strategies outlined in the plan. By systematically reviewing and assessing the outcomes, Riyadh Air ensures a proactive approach to refining and optimizing the FRMS for continual enhancement in safety protocols.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.5	CONTINUOUS IMPROVEMENT	**Revision:**	00
		Date:	18-Feb-2024

4.5.1   Feedback

Crew member feedback at Riyadh Air is crucial for identifying fatigue hazards, assessing the effectiveness of controls and mitigations, and contributing to FRMS Safety Performance Indicators. This involves active participation in surveys and fatigue-monitoring studies. To foster open and honest communication, all stakeholders in Riyadh Air's FRMS must have a clear understanding of policies governing data confidentiality and the ethical use of crew member-provided information. Additionally, it is essential to establish clarity regarding thresholds distinguishing non-culpable fatigue-related safety events from deliberate violations that could lead to penalties.

Providing timely feedback to crew members who submit Fatigue Reports is of the utmost importance. Feedback does not necessitate the completion of a full investigation. Each crew member at Riyadh Air should receive a prompt response to their report, along with an indication of planned follow-up activities. This approach ensures transparency and proactive engagement in addressing fatigue-related concerns raised by the crew.

4.5.2   Fatigue Survey

Each operating department shall conduct biannual surveys for fatigue awareness. The de-identified responses shall be part of the Fatigue Awareness circular.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.6	REVIEW AND RECOMMENDATIONS	**Revision:**	00
		Date:	18-Feb-2024

4.6 REVIEW AND RECOMMENDATIONS

Once fatigue data is collected and analyzed, relevant Safety Action Group (SAG) shall utilize this information to conduct a thorough analysis of fatigue-related events. The primary objectives are to determine the root cause, identify recurring factors contributing to fatigue events, and formulate recommendations for policy and procedural changes. These changes are aimed at minimizing crew fatigue on both an individual and systemic level.

The SAG coordinator compiles a report after each meeting. This report outlines the SAG's findings and includes recommendations for enhancing the safety culture at Riyadh Air, promoting continuous improvement in safe operations. Additionally, the SAG coordinator follows up on schedule adjustments as directed by the SAG.

Fatigue Review employs six categories to accurately understand and mitigate fatigue-related risks:

1. Operational,

2. Non-operational,

3. Self-induced,

4. Informational,

5. Contributory, and

6. Miscategorized events.

The SAG, in its role of reviewing relevant information on report circumstances, gathers data such as duty lengths, rest periods, work schedules, sleep opportunities, commute times, delays, city pairs,; deviations or extended duty time, the schedule leading up to the event, actions or inactions of flight attendants to obtain rest, subjective and objective evidence of fatigue, relevant health or medical conditions; communications prior to and during the event; and outside factors inhibiting rest; as well as hotel issues.

The SAG may consult with Subject Matter Experts and solicit information through written departmental requests and crew interviews to aid in the analysis of Fatigue Reports. Upon completing the event review, the SAG categorizes each Fatigue Report into one of the six defined categories.

Of the six categories, the first three address fatigue events resulting in a crew not flying, while the second three address fatigue events not resulting in lost flight time, but that have failed to identify fatigue-related issues.

1. **Operational Fatigue**: Related to fatigue during company flight time, duty time, or rest assignments. This includes unfavorable trip constructions, back-to-back combinations of trips, layover hotel problems, or irregular operations within the Company's control.

2. **Non-Operational Fatigue**: Related to fatigue not necessarily associated with company flight time, duty time, rest periods, or the actions/inactions of the crew member. Typically results from

FATIGUE RISK MANAGEMENT SYSTEM

4   FATIGUE REPORT MANAGEMENT

4.6   REVIEW AND RECOMMENDATIONS

Issue: 00

Revision: 00

Date: 18-Feb-2024

situations not intentionally created by either the crew or the Company, such as irregular operations or the inability to sleep due to unpreventable interferences at home.

3. **Self-Induced Fatigue**: Related to fatigue generated as a direct or indirect result of the crew actions or inactions. May be subject to the attendance and reliability policy, and the SAG will inform the crew if the event may be subject to further review. However, the report's content remains within the review process, and may not be used in subsequent reviews.

4. **Informational Fatigue**: Designed to bring awareness to situations that, in the crew's opinion, have the potential to contribute to a degradation of safety or create a fatigue event.

5. **Contributory Fatigue**: A special type of Informational Fatigue Report where the segment was operated with a resulting crew error reported. After taking appropriate action within the fatigue program.

6. **Miscategorized Events**: Events not attributed to fatigue, such as those related to personal illness or personal medical situations.

Crew members have the right to appeal the categorization of a Fatigue Report. Initial appeal requests must be submitted in writing to the relevant SAG within 30 calendar days, including as much additional information as possible for review. The SAG re-evaluates the event and must reach a unanimous decision on the re-categorization. Crew members may request or be requested to attend debriefing.

If the SAG fails to obtain a consensus on any matter, the SAG may appeal the matter to the Safety Review Board (SRB). Once escalated, the SRB has 30 days to render a final determination.

In case of disputes among the SAG concerning fatigue policy, procedure, or protocol:

1. The SAG's fatigue review is put on hold till the SRB resolves the dispute.

2. The resolution occurs promptly to ensure FRMS compliance.

3. Once the evaluation process is complete, and a categorization is assigned, the SAG provides written feedback to the crew and to Crew Scheduling.

The contributing factors and de-identified reports obtained during Root Cause Analysis are retained. These reports, along with other data, serve as sources for trend identification, enabling the creation, review, and monitoring of fatigue mitigation strategies, recommendation of trip modifications, schedule variations, and specific program amendments for Riyadh Air. This information is aggregated to identify systemic issues. SAG-recommended mitigations of an immediate nature are proposed to Corporate Safety, Security, Quality, and Environment (CSSQE) and Flight Scheduling, along with applicable Subject Matter Experts.

Additionally, the SAG assists in the evaluation of the FRMS by reviewing:

1. Historical fatigue data trends.

2. Mitigation strategy effectiveness.

FATIGUE RISK MANAGEMENT SYSTEM

4 FATIGUE REPORT MANAGEMENT	**Issue:** 00
4.6 REVIEW AND RECOMMENDATIONS	**Revision:** 00
	Date: 18-Feb-2024

3. Improvement of crew alertness.

4. Potential changes to policies and procedures.

The SRB is tasked with overseeing the effective implementation and continual improvement of the Fatigue Risk Management System at Riyadh Air.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.7	REPORT FORMAT	**Revision:**	00
		Date:	18-Feb-2024

4.7   REPORT FORMAT

Refer to Corporate Safety Management Manual, Section 6.1 for Fatigue Report Format.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.8	DATA COLLECTION	**Revision:**	00
		Date:	18-Feb-2024

4.8   DATA COLLECTION

Data collection stands as a foundational component in evaluating the efficacy of the Riyadh Air Fatigue Risk Management System (FRMS). Rather than being a one-time task within the FRMS life cycle, it forms an integral part of Riyadh Air's day-to-day operations. The objective is to provide Riyadh Air with insights into suspected areas contributing to fatigue and to ensure a comprehensive understanding of operational factors likely to induce crew member fatigue.

Prioritization: Given the diverse effects and multiple causes of fatigue-related impairment, a singular measurement cannot fully depict a crew member's or employee's current fatigue level or the factors contributing to fatigue. Riyadh Air must prioritize data collection efforts based on expected fatigue risks. Resource-intensive data collection should be directed toward operations with anticipated higher fatigue-related risks.

Efficiency: Balancing the need for sufficient data to inform decisions and actions with the associated demands and costs of data collection is crucial. Data analysis should guide Riyadh Air in determining appropriate mitigations and controls to manage fatigue risks effectively, utilizing limited resources efficiently.

Sample Sources: Riyadh Air should consider sampling data from various sources, including:

Crew Reporting:

1.   Reports of sickness.

2.   Crews reporting fatigue.

3.   Crews filing Fatigue Reports.

The Company:

1.   Flying program fluctuates on monthly and seasonal basis.

2.   Market sector data.

3.   Aircraft operated.

Scheduling:

1.   Schedule stability and changes.

2.   Unplanned night stops.

3.   Time between schedule changes.

4.   Use of reserve flight crew members.

5.   Block hours, duty hours, and extensions of flight duty periods.

Days Off:

1.   Number and distribution of days off.

FATIGUE RISK MANAGEMENT SYSTEM

4	FATIGUE REPORT MANAGEMENT	**Issue:**	00
4.8	DATA COLLECTION	**Revision:**	00
		Date:	18-Feb-2024

2.   Frequency of single-day off usage.

3.   Leave information.

The Duties:

1.   Duty transitions.

2.   Working the Window of Circadian Low (WOCL).

3.   Rest between duties.

4.   Number of segments per day.

5.   Long/extended duty days.

6.   Length of Flight Duty Periods (FDP).

Contingency Plans:

1.   Delayed report usage.

2.   Reserve assignments.

3.   Time between reserve call and showtime.

4.   Working on days off.

Scheduled vs. Actual:

1.   Task analysis of duty days.

2.   Operational issues.

3.   Reportable/Measurable Data:

4.   Fatigue incident reports.

5.   Aviation Safety Reporting Systems (ASRS) data.

6.   Aviation Safety Action Program (ASAP) reports.

7.   Biomathematical computer modeling.

Internal Actions:

1.   Fatigue Safety Action Group (FSAG) meeting minutes.

2.   Fatigue survey data.

3.   Internal incident/accident reports.

4.   External reports, studies, reviews, and accident/incident reports.

Planned Data Collections:

1.   Sleep data.

FATIGUE RISK MANAGEMENT SYSTEM

4 FATIGUE REPORT MANAGEMENT	**Issue:** 00
4.8 DATA COLLECTION	**Revision:** 00
	Date: 18-Feb-2024

2. Cognitive performance data.

3. Flight performance data.

4. Scheduling data.

Other Data Sources:

1. Hazard reporting and investigations.

2. Operational data related to fatigue.

3. Audits and surveys.

4. Reviews and fatigue studies.

FATIGUE RISK MANAGEMENT SYSTEM

5	CONTROLLED REST ON THE FLIGHT DECK	**Issue:**	00
4.8	DATA COLLECTION	**Revision:**	00
		Date:	18-Feb-2024

5   CONTROLLED REST ON THE FLIGHT DECK

ICAO DOC 9966 APPENDIX C

Refer OM-A Section 8.3.10.6

FATIGUE RISK MANAGEMENT SYSTEM

5 CONTROLLED REST ON THE FLIGHT DECK	**Issue:** 00
4.8 DATA COLLECTION	**Revision:** 00
	Date: 18-Feb-2024

INTENTIONALLY LEFT BLANK

FATIGUE RISK MANAGEMENT SYSTEM

6 APPENDIX	**Issue:** 00
6.1 FATIGUE REPORT FORMAT	**Revision:** 00
	Date: 18-Feb-2024

RIYADH AIR
طيران الرياض

6 APPENDIX

6.1 FATIGUE REPORT FORMAT