Staff Instruction

Subject: **Fatigue Risk Management System Assessment Guide**

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Staff Instruction (SI) is to describe the procedures to be used by Transport Canada Civil Aviation (TCCA) personnel when conducting assessments of Fatigue Risk Management Systems (FRMS) being used by Canadian certificate holders.

1.2 Applicability

This document applies to TCCA Headquarters and regional personnel.

1.3 Description of Changes

Not applicable.

2.0 REFERENCES AND REQUIREMENTS

2.1 Reference Documents

(1) It is intended that the following reference materials be used in conjunction with this document:

(a) Transport Canada Publication (TP) 14572E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *An Introduction to Managing Fatigue;*

(b) TP 14573E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *Fatigue Management Strategies for Employees*;

(c) TP 14574E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *Employee Training Assessment*;

(d) TP 14575E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *Developing and Implementing a Fatigue Risk Management System;*

(e) TP 14576E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *Policies and Procedures Development Guidelines*;

(f) TP 14577E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *Fatigue Audit Tools*;

(g) TP 14578E: Fatigue Risk Management Systems for the Canadian Aviation Industry: *Trainer's Handbook*;

(h) SI SUR-001 Issue 04, dated 2010-11-17 - *Surveillance Procedures*;

(i) Advisory Circular SUR-001 Issue 02, dated 2011-03-22 – *Development and Implementation of Fatigue Risk Management Systems In The Canadian Aviation Industry.*

2.2 Cancelled Documents

Not applicable.

Note: By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

2.3 Definitions and Abbreviations

(1) The following definitions and abbreviations are used in this document:

(a) **Accountable Executive**: the individual responsible for operations or activities authorized under the certificate and accountable on their behalf for meeting the requirements of the *Canadian Aviation Regulations* (CARs). The Accountable Executive must have [full]

control of the financial and human resources that are necessary for the activities and operations authorized under the certificate.

(b) **Assessment:** the surveillance activity conducted to evaluate effectiveness and level of compliance with the CARs.

(c) **CAD**: Civil Aviation Document.

(d) **CARs**: Canadian Aviation Regulations.

(e) **Error**: a safety-critical event that does not result in equipment damage, injury or death, but could potentially do so in different circumstances.

(f) **Fatigue**: an increased level of sleepiness associated with impaired cognitive and/or physical functioning and, as a consequence, an elevated risk of error or accident. For the purposes of this policy, fatigue is due primarily to increased duration of wakefulness and/or reduced duration of sleep.

(g) **Fatigue Audit**: one in which an electronic or manual tool can be used to calculate the relative sleep opportunity for an "average" individual using work schedules as the primary data input for the audit activity.

(h) **Fatigue Audit InterDyne (FAID)**: a software package that calculates the relative sleep opportunity for a hypothetical 'average' individual using scheduled attendance as the primary data input. The sleep opportunity (or FAID) score at any particular time is a weighted aggregate based on the timing and duration of work and non-work periods, the time of day at which they occur and social and family factors influencing the propensity to sleep. Typically the result is expressed as a score between 0—150. Scores below a task specific threshold are generally considered to provide an adequate sleep opportunity. Scores over the threshold are generally considered to provide a reduced sleep opportunity and require significant additional levels of hazard control. In general the level of control required is proportional to the degree to which the FAID score exceeds the threshold.

(i) **Fatigue Proofing Strategies**: strategies to reduce the consequence of an incident when individuals are required to work through periods of high fatigue.

(j) **Fatigue Reduction Strategies**: strategies to reduce the likelihood of individuals being at risk of making a fatigue-related error while at work.

(k) **FRMS**: Fatigue Risk Management System.

(l) **Person Responsible for the FRMS**: the person(s), accountable to the Person Responsible for Maintenance or Operations Manager, with specific responsibilities under this document.

(m) **Hazard**: a source of potential error or incident that or a situation with a potential cause to damage equipment, result in injury or death.

(n) **Incident**: a safety critical event that does result in equipment damage, injury or death.

(o) **Legal Entity**: a person having legal personality (capable of enjoying and being subject to legal rights and duties). A legal entity may be:

  (i) a natural person, or a group of natural persons;

  (ii) an incorporated organization or association, or a group of such companies or associations;

  (iii) a body corporate or politic created by statute.

(p) **Non-work related causes of fatigue**: factors contributing to a state of fatigue for which an individual employee is primarily responsible.

(q) **Organization**: a council, an individual, a company or an organization, and is used generically.

(r) **Operator**: the same as “organization” .

(s) **Owner**: the legal entity holding the CAD.

(t) **Policy**: the operator’s FRMS policy and procedures document.

(u) **Recovery sleep**: the sleep achieved away from the workplace enables the individual to recuperate from the work period and begin to pay back any sleep debt accumulated while on shift.

(v) **Regulator**: Transport Canada Civil Aviation.

(w) **Risk**: a calculation of consequence (potential loss) and likelihood (probability/frequency) of a potential incident.

(x) **Shift work**: any work schedule that requires the individual to work at night (between 2100hrs and 0700hrs), in the afternoon/evening (after 1700hrs), weekend work (Saturdays/Sundays), very early hours (pre 0600hrs starts), or working shifts longer than 8 hours (including managers on open contracts with unspecified hours if they take work home, come in early and go home late, are on call and carry a pager they never turn off).

(y) **Sleep**: a reversible behavioural state of perceptual disengagement from, and unresponsiveness to the environment.

(z) **Sleep Apnea**: a respiratory sleep disorder that causes multiple awakenings during sleep and, as a consequence, reduced recuperative value for sleep and increased levels of fatigue. In severe cases it has also been associated with significant cardiovascular disease and long-term health problems.

(aa) **Sleep debt**: when an individual does not achieve adequate restorative sleep. A sleep debt can accumulate over a period of days of inadequate sleep. This debt may result in impaired performance, reduced alertness and higher levels of sleepiness and fatigue. A sleep debt can only be repaid with recovery sleep.

(bb) **Sleep deprivation**: loss of sleep that can occur either acutely (total night’s sleep loss) or partially (some sleep lost each night over a period of nights). Both result in reduced levels of alertness and performance.

(cc) **Sleep duration**: the period between sleep onset time and wake up time, less awakenings.

(dd) **Sleep inertia**: the delayed impairment effects of sleep on cognitive performance immediately following waking. The main effects of sleep inertial normally dissipate after approximately 20 minutes.

(ee) **Sleep opportunity**: the time within a 24-hour period that a person has available for sleep. Hours of work, together with commute times, primarily dictate the duration of sleep opportunity, and the timing and type of work will dictate whether the sleep opportunity is regular, irregular, predictable or unpredictable.

(ff) **Sleep length**: the total amount of sleep obtained during each sleep period.

(gg) **Safety Management System (SMS)**: a documented process for managing risks that integrates operations and technical systems with the management of financial and human resources to ensure aviation safety or the safety of the public.

(hh) **Sufficient sleep**: that the average person requires 5 hours sleep on a once-off basis, and 6 hours sleep on a recurring basis per 24-hour period before experiencing fatigue-related performance decrements.

(ii) **Work-related causes of fatigue:** factors contributing to a state of fatigue for which the organization is primarily responsible.

3.0 BACKGROUND

(1) The FRMS Assessment Guide covers the components and elements of the TCCA FRMS model. Expectations, scoring criteria, and associated questions have been developed for each element and are based on the 7 above referenced TP documents (FRMS for the Canadian Aviation Industry) and the CARs.

(2) This Assessment Guide should be used in conjunction with SI-SUR-001 - Surveillance Procedures.

4.0 FATIGUE RISK MANAGEMENT SYSTEM FRAMEWORK

Table A outlines the FRMS framework and follows the same structure as the TCCA FRMS model, which is outlined in guidance document TP 14575E - FRMS for the Canadian Aviation Industry: An Introduction to Managing Fatigue. It has five components and corresponding elements, with component '0' representing the overall FRMS.

Table A—FRMS Assessment Protocol Framework

Component	Element
0. Fatigue Risk Management System	
1. Fatigue Risk Management Plan	1.1 Fatigue Risk Management Policy
	1.2 Roles, Responsibilities & Employee Involvement
	1.3 Communication & Consultation
2. Fatigue Risk Management Controls	2.1 Work Hours & Sleep Opportunity
	2.2 Personal Fitness for Duty—Prior Sleep and Wake
	2.3 Personal Fitness for Duty—Symptoms and Behaviours
	2.4 Fatigue Proofing Strategies
3. Fatigue Risk Management Oversight	3.1 Hazard Identification & Reporting Processes
	3.2 Investigation and Analysis
	3.3 Risk Management
4. Training	4.1 Training, Awareness and Competence
5. Documentation	5.1 Identification and Maintenance of Applicable Regulations
	5.2 FRMS Documentation

	5.3 Records Management

5.0 ASSESSMENT PROCEDURE

Assessment procedures are contained in SI SUR-001. Appendix A contains questions related to the expectations of a FRMS.

6.0 SCORING PROCEDURES

Scoring procedures are contained in SI SUR-001. Appendix B contains expectations and scoring criteria of a FRMS.

7.0 ASSESSMENT REPORT

Procedures for writing an assessment report are contained in SI SUR-001. An assessment report template is provided in Appendix C.

7.1 Component Score

The assessment report will indicate the score for each component using the following or similarly formatted table:

Component	Title	Score
1	Fatigue Risk Management Plan	
2	Fatigue Risk Management Controls	
3	Fatigue Risk Management Oversight	
4	Training	
5	Documentation	

8.0 CONTACT OFFICE

For more information, please contact the:

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Suggestions for amendment to this document are invited, and should be submitted to the Transport Canada Civil Aviation Issues Reporting System (CAIRS) at the following e-mail adress: CAIRS_NCR@tc.gc.ca (or Internet address: http://www.tc.gc.ca/CAIRS).

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APPENDIX A — QUESTIONS RELATED TO THE EXPECTATIONS OF A FATIGUE RISK MANAGEMENT SYSTEM

Table A0—Questions: Fatigue Risk Management System

Component	0. Fatigue Risk Management System
Element	

Questions

To the accountable executive:

(A) Has a FRMS been established for your organization?

(A) How do you maintain it?

(A) How do you ensure that it is adhered to?

(BP) Are you a multiple certificate holder? If so, explain how you have established a single FRMS with integrated operations

(B) How do you ensure that your FRMS procedures are appropriate to the size and complexity of your organization?

To the functional department heads:

(BP) Is your organization a multiple certificate holder? If so, explain how you have integrated FRMS activities with departments under other certificates.

(BP) How are your FRMS activities coordinated with the FRMSs of organizations providing services?

To employees:

(A) What is your understanding of your organization's FRMS?

Table A1—Fatigue Risk Management Plan

	Component	1. Fatigue Risk Management Plan
	Element	1.1 Fatigue Risk Management Policy
	Questions	
	To the accountable executive:	
(A,C)	How would you summarize your fatigue risk management philosophy and expectations from your organization's FRMS? Are there any particular FRMS policy initiatives with which you or your senior management are personally identified? (show me)	
(D,F)	How do you communicate your FRMS performance expectations to the organization? Are there any FRMS issues that you expect to have a significant impact on your organization's performance?	
(E)	How often do you critically review the standing FRMS policy? Who is involved in this review?	
(BP)	How do you assess the extent to which the FRMS policy and FRMS processes are understood within your organization? How do you measure your organization's FRMS performance? How is the information from these performance appraisals used?	
(B)	How has your FRMS policy influenced the development of your FRMS? Show me an example.	
(G)	Outline the organization's commitment in managing fatigue-related risk.	
(H,I)	What is the organization's policy for fatigue risk management?	
	To the functional department heads:	
(F)	What expectations does your employer have with respect to you and your department's FRMS performance? How are these expectations communicated to you? Can you explain your role in the development of your safety obligations and your department's FRMS performance criteria?	
(D)	How do you communicate FRMS processes/obligations to personnel within your department? How do you assess the extent to which FRMS policy and FRMS processes/obligations are understood within your department?	
(J)	How are employees involved in the maintenance of the FRMS?	
(G)	How committed is the organization to managing fatigue-related risk? Explain.	
(H,I)	What is the organization's policy for fatigue risk management?	
	To employees:	
(F)	What is your understanding of management's expectations of you with respect to organizational FRMS performance?	
(D)	How would you characterize management's commitment to strong FRMS performance?	
(BP)	How does management make you aware of the relationship between the FRMS policy and different fatigue risk management initiatives?	
(H,I)	What is the organization's policy for fatigue risk management?	
(J)	To what extent (how) have you been involved in the establishment and review of the FRMS?	

Element	1.2 Roles, Responsibilities and Employee Involvement

Questions

To the accountable executive:

(C,H) What do you understand your FRMS-related responsibilities to be? Are these documented anywhere? (show me)

(B,C) Who is the person appointed to manage the operation of the FRMS within your organization? How were they selected for this position? What do you understand their FRMS-related responsibilities to be? Are these documented anywhere? (show me)

(F) How are personnel informed about their responsibilities under FRMS?

To the person appointed to manage the operation of FRMS:

(E,F) What do you understand your FRMS-related responsibilities to be? Are these documented anywhere? (show me)

(C,F) What authorities, resources and support have been given to you in order to allow you to fulfill your role as person appointed to manage the operation of FRMS for the organization? Are these supported by documentation and actions from management? (show me)

(C) What qualification and experience do you have that justify your appointment to this position? How confident are you in this role?

To the functional department heads:

(H) What do you understand to be your FRMS-related responsibilities to be? Are they documented anywhere?

(D) Do you feel that roles and responsibilities for FRMS management within the organization are clearly and appropriately defined? If not, why not and where could they be sharpened?

(E) When are fatigue risk management authorities, responsibilities and accountabilities reviewed?

(BP) Can you show me a sample of job descriptions and/or an organizational diagram illustrating FRMS responsibilities within the organization?

To employees:

(H) What do you understand your own FRMS roles and responsibilities to be?

	Element	1.3 Communication and Consultation
	Questions	
	To the accountable executive and functional department heads:	
(A)	What communication and consultation processes or methods are in place within your organization? Explain how these processes help your FRMS to function effectively.	
(B)	How often are FRMS meetings held? Who attends these meetings? Do you attend any FRMS meetings? How often?	
(C)	How is FRMS related information distributed to personnel? Where and how is this recorded? (show me)	
(D)	How is fatigue risk management information shared within the organization (horizontally and vertically throughout the organization)? How do you know these methods/processes are working?	
(D)	How is information on the FRMS related matters shared between departments? How do you ensure there is organizational wide, uncomplicated communications?	
(BP)	What mechanisms are in place that allow consultation with personnel about fatigue-related issues? (Horizontally and vertically throughout the organization)	
(BP)	How do you know what the results of the consultation meetings are? How are minutes or decision records kept? How are the results of these consultation meetings communicated to the wider employee body?	
(BP)	How are all ideas, including out-stations and outsource functions included in the communications and consultation network?	
(BP)	How are personnel informed as to who their primary contact for FRMS related matters is?	
(BP)	How are best practices identified and shared across the organization?	
	To employees:	
(A)	How do you know FRMS activities are going on within your organization? What evidence do you see that shows FRMS is or is not working?	
(B)	How often are meetings held? Who attends these meetings? Do you attend any FRMS meetings? How often?	
(C)	If you needed information related to fatigue risk management issues, procedures or processes, how would you get it?	
(C)	How is fatigue risk management information communicated to you?	
(D)	How do you communicate fatigue-related information? Do you believe your opinions are heard and acted upon?	
(BP)	Has there ever been a fatigue related or quality matter that you felt should be brought to the attention of management? How did you deal with this? What response did you receive from management?	
(BP)	Who is your primary contact for aviation fatigue risk management related matters? Do you feel comfortable bringing issues to this person? (explain why/why not)	

Table A2—Fatigue Risk Management Controls

	Component	2. Fatigue Risk Management Controls
	Element	2.1 Work Hours & Sleep Opportunity
	Questions:	
	To the accountable executive and functional department heads:	
(A)	What system does your organization have in place to record planned work schedules and rosters? (show me)	
(BP)	How are your work schedules and rosters coded so that everyone can easily understand them?	
(B)	What system does your organization have in place to record actual hours of work? (show me)	
(C)	Describe the process for ensuring planned work schedules and rosters provide sufficient sleep opportunity for employees (prospective analysis).	
(C)	Describe the process for ensuring actual hours of work have provided sufficient sleep opportunity for employees (retrospective analysis).	
(D,E)	In what time frame are planned work schedules and rosters, as well as actual work hours analyzed for providing sufficient sleep opportunity?	
(F)	What actions are taken if your analyses indicate that insufficient sleep opportunity has been provided? (for both prospective and retrospective analyses)	
(G)	How are your analyses of sleep opportunity, and any actions taken as a consequence of analyses, recorded and documented? (show me)	
(H)	Where actual hours of work vary significantly from planned hours of work, how do you ensure that employees are provided with sufficient sleep opportunity?	
(I)	What checks and balances do you have in place to ensure the processes you have for ensuring sufficient sleep opportunity are effective?	
(BP)	What role do employees have in developing and revising work schedules and rosters?	
	To employees:	
(H)	How often do your actual work hours vary from your planned work hours?	
(B)	How do you inform your supervisor/manager of your actual work hours (versus your planned work hours)?	
(C)	Do your work hours generally provide you with sufficient sleep opportunity?	
(F)	Describe the effort taken by management to ensure you are provided with sufficient sleep opportunity in between work shifts.	
(F)	What actions are taken by both yourself and management, if insufficient sleep opportunity has been provided (i.e. too little time off in between shifts)?	
(BP)	To what extent are you involved in work schedule and roster development and review?	

	Element	2.2 Personal Fitness for Duty—Prior Sleep and Wake
	Questions:	
	To the accountable executive and functional department heads:	
(A,B)	What parameters are in place to determine whether individual employees have obtained sufficient sleep to be fit for work (Set thresholds for prior sleep and wake rules)? How did you set these parameters?	
(C)	How are the prior sleep and wake rules reviewed to determine whether they are effective?	
(D)	What is expected of employees when they have not obtained sufficient sleep according to the prior sleep and wake rules?	
(B)	What reference tools are provided to inform employees whether they have obtained sufficient sleep?	
(E)	How is prior sleep and wake data collected for review and audit purposes within the organization?	
	To employees:	
(D)	How much sleep does the organization require you to obtain prior to commencing work? (prior 24 & 48 hours)	
(D)	What actions are you expected to take if you have not obtained sufficient sleep prior to commencing work?	
(D)	Do you feel comfortable discussing your sleep with management and/or your supervisor? Why/why not?	
(F)	If you are regularly having problems obtaining sufficient sleep, what actions are taken by you and your organization?	
	Element	2.3 Personal Fitness for Duty—Symptoms and Behaviours
	Questions:	
	To the accountable executive and functional department heads:	
(A)	What tools and/or processes are in place to monitor employees for fatigue-related symptoms and behaviours?	
(B)	What actions are taken if an employee is observed to be exhibiting fatigue-related symptoms and behaviours?	
(C)	What action is taken if an employee exhibits fatigue-related symptoms and behaviour on a regular basis?	
(D)	How is fatigue-related symptom and behaviour data collected for review and audit purposes within the organization?	
(D)	What checks and balances do you have in place to ensure the processes you have for ensuring your process for observation of fatigue-related symptoms and behaviours is effective?	
	To employees:	
(A)	What are some of the major symptoms and behaviours that indicate fatigue-related impairment?	
(B)	What action would you take if you observed significant fatigue-related symptoms and behaviours in yourself?	
(BP)	What action would you take if you observed significant fatigue-related symptoms and behaviours in a colleague?	
(C)	Do you feel comfortable reporting fatigue-related symptoms and behaviours to your supervisor and/or manager as a reason for unfitness for duty? Why/why not?	
(C)	If you were regularly experiencing fatigue-related symptoms and behaviours, what actions would be taken by your organization?	

	Element	2.4 Fatigue Proofing Strategies
	Questions:	
	To the accountable executive and functional department heads:	
(A)	What fatigue proofing strategies are currently employed by your organization to minimize the consequence of fatigue-related risk?	
(B,C)	How did you decide on these as appropriate proofing strategies for your organization?	
(D)	How are these strategies promoted for use amongst the employee body?	
(BP)	What napping facilities and policies are in place within your organization?	
(C)	Under what circumstances are employees permitted to use each of the fatigue-proofing strategies?	
(B,E)	How do you determine the effectiveness of each fatigue-proofing strategy?	
	To employees:	
(A)	What fatigue proofing strategies are promoted for you to use for reducing the consequence of fatigue-related risk?	
(BP)	Are you ever allowed to nap at work? If so, at what times and where? How long should you take to wake up from a nap before performing safety-critical work?	
(A)	Are there any fatigue proofing strategies you use on a regular basis? Which ones? Describe how they assist in reducing the effects of fatigue.	
(E)	Are there any fatigue proofing strategies that are ineffective? Which ones? Explain why you believe this.	
(C)	Under what circumstances are you permitted by management to use each of the fatigue proofing strategies?	

Table A3—Fatigue Risk Management Oversight

	Component	3. Fatigue Risk Management Oversight
	Element	3.1 Hazard Identification and Reporting Processes
	Questions:	
	To the accountable executive and upper management:	
(A)	What consequences are there for employees who report fatigue-related hazards or events? How is this determined?	
(B,D)	How does the organization ensure that fatigue-related hazards, occurrences, incidents, accidents and other data relevant to FRMS are captured? What is done with this data after it has been collected?	
(C,D)	Is there a reporting process that captures fatigue-related information such as hazards, occurrences, incidents and accidents? Please explain how this process works and why it is appropriate for your organization.	
(BP)	Show me the report form(s). Who has access to these forms? What do employees have to do to get (and then submit) these forms?	
(D)	Do you review reports? How do you determine which reports to review? On what basis do you pass on the reports to other levels of management?	
(D)	How do employees know if their reports have been read or heeded?	
(BP)	Is there a process in place to investigate and analyze reported events? Explain.	
(H)	Explain how FRMS data is analyzed, trends identified and monitored.	
(J)	Explain the data collection processes throughout the safety critical areas of the organization. How do these processes permit organization wide analysis of fatigue-related issues?	

(K)	Explain the standard procedure for response to fatigue-related event analysis. What is the timeline for these actions? How does this impact the future operations of the organization?
(H)	Explain how the organization evaluates its own FRMS. Can you identify planned self-evaluation processes? How often are these processes conducted?
(BP)	What are your criteria for evaluating risk? What is considered a tolerable level of risk and how is this level determined?
	To the functional department heads:
(B)	How are hazards, incidents, accidents and other data relevant to FRMS captured within your department? What type of information, reports or data are collected to proactively identify safety concerns, or to investigate whether fatigue was a contributing factor to incidents or accidents? What is done with this data once collected?
(D)	How are reports reviewed? On what basis do you pass on reports to other levels of management?
(E)	How do employees know if their reports have been read or heeded?
(F)	Is there a process in place to investigate and analyze fatigue occurrences? (see note) Explain.
(F)	Is there a process in place to monitor and analyze documented fatigue occurrences? Explain.
(K)	Is there a process in place to investigate and analyze reported events? Explain.
(F)	Is there a process in place to monitor and analyze trends documented? Explain.
(L)	What actions are taken in response to event analysis? If a trend is revealed, what type of mitigation actions are taken? How does this affect future operations within your department?
(H)	Explain how the effectiveness of FRMS is evaluated within your department. Can you identify planned self-evaluation processes? How often are these processes conducted?
(BP)	Are you aware of specific criteria for evaluating risk or identified fatigue-related hazards? How does this relate to the level of risk you are willing to accept?
	To employees:
(B,C)	Explain how you would report a fatigue-related occurrence, concern, incident, accident, occurrence, or safety concern. How is feedback given to those who report? Can you give me an example where results of incident analyses were shared?
(BP)	Are you comfortable reporting incidents, accidents and occurrences? Explain
(BP)	Can you show me the form you would fill out in making this report and explain the process for submitting this report?
(BP)	Is it worth your time to communicate safety concerns and report fatigue-related occurrences? Explain why (or why not) you make use of the reporting process.
(K)	Do you ever feel that fatigue-related patterns in occurrences, concerns, accident or incidents go unnoticed? Does management heed your fatigue-related safety concerns and act accordingly? How quickly?
(K,L)	What does your manager do when a fatigue-related concern is raised? What do they do if there has been an incident or accident? Can you give me an example of actions taken in response to a fatigue-related safety event or identified concern? Did normal operating procedures change as a result of this event? How?
(L)	Do you feel that adequate corrective and preventive actions are generated in response to event analysis? Are you confident that management is given the power and resources to take appropriate actions when required? Explain how these powers are exercised.
(BP)	How do you assess risk in your job? Are you aware of specific criteria for acceptable levels of risk to your work or that of your work tem?

Note:

A fatigue occurrence is any instance where an employee reports their performance may be impaired due to fatigue. This may be based on work hours, insufficient sleep or experience of behavioural symptoms.

	Element	3.3 Investigation and Analysis
	Questions:	
	To the accountable executive and functional department heads:	
(A)	Explain how investigations are conducted in response to fatigue related occurrences and deficiencies.	
(B)	What measures exist to ensure all reported fatigue occurrences and deficiencies are analyzed?	
(C)	How do you ensure that fatigue related occurrences and deficiencies are reported and analyzed? What is the goal of this analysis?	
(D)	Explain what and how actions are taken in response to event investigation and analysis.	
(E)	Explain how you select personnel to conduct investigations.	
(F)	What data is collected to analyze whether fatigue was a potential root cause to events?	
(G,I)	How are investigation analysis results communicated to appropriate managers? How are appropriate managers identified? How do they decide what action to take?	
(H)	Describe the risk analysis process you take to determine the level of action required upon receipt of investigation analysis results.	
	To employees:	
(A)	Explain how investigations are conducted within your department when fatigue related occurrences and deficiencies are identified or reported.	
(B)	What measures are taken by management to ensure all reported fatigue related occurrences and deficiencies are investigated?	
(B)	What measures are taken by staff to ensure all reported fatigue-related occurrences and deficiencies are investigated?	
(C)	How do you know that occurrences and deficiencies are reported and analyzed? What are the goals of this analysis? What role does the staff play in the analysis of fatigue-related occurrences and deficiencies?	
(D)	Do you feel that adequate corrective and preventive actions are generated in response to event investigation and analysis? Are you confident that management is given the power and resources to take appropriate actions when required? Can you give me an example of changes to procedures or work practices initiated as a result of an identified fatigue-related concern or hazard?	

	Element	3.4 Risk Management
	Questions:	
	To the accountable executive and upper level management:	
(A)	What is the process for the assessment of fatigue-related risk associated with identified hazards? How is risk expressed in terms of severity, level of exposure and probability of occurrence?	
(B)	What are your criteria for evaluating risk? What is considered a tolerable level of risk and how is this level determined?	
(C)	Outline the organization's risk control strategy. What corrective/preventive action plans are in place to prevent recurrence of reported occurrences and deficiencies?	
(D)	How is the effectiveness of implemented corrective/preventive measures evaluated? What actions might be taken as a result of an unsatisfactory evaluation? What sort of timeline is associated with conducting this evaluation and the implementation of further corrective actions?	
(E)	How are corrective/preventive actions documented? What type of information is included in this documentation? (show me)	
(F,G,H)	Outline the organization's fatigue risk classification system, and how it contributes to the ongoing development of the FRMS.	
(I)	Describe how risk management processes are documented and recorded within your organization.	
	To the functional department heads:	
(B)	Are you aware of specific criteria for evaluating risk of identified hazards? How does this relate to the level of risk you are willing to accept?	
(C)	Outline the risk control strategy employed to your department. What corrective/preventive action plans are in place to prevent recurrence of reported occurrences and deficiencies? How does this relate to the strategy and plans of the organization as a whole?	
(D)	How do you evaluate the effectiveness of implemented corrective/preventive measures? What actions might you take as a result of an unsatisfactory evaluation? What sort of timeline is associated with the conduct of this evaluation and the implementation of further corrective actions? What are the critical factors affecting this timeline?	
(E)	How are corrective/preventive actions documented? What type of information is included in this documentation? (show me) How often and for what purpose do you reference this documentation? How and when is this documentation shared with upper level management or other departments?	
	To employees:	
(B)	Are you aware of specific criteria for evaluating risk of identified hazards? How does this relate to the level of risk you are willing to accept?	
(C)	What approach do management take for the control of risk within your work environment? What planning actions are taken by management to prevent recurrence of reported occurrences and deficiencies? How are you involved in this process?	
(D)	What evidence do you see that indicates the effectiveness of implemented corrective/preventive measures? What sort of timeline is associated with the conduct of this evaluation and the implementation of further corrective actions?	
(E)	How are corrective/preventive actions documented? What type of information is included in this documentation? (show me) How are you involved in the maintenance of this documentation? How often and for what purpose do you reference this documentation?	

Table A4—Training

	Component	4. Training
	Element	4.1 Training, Awareness and Competence
	Questions:	
	To the accountable executive and upper management:	
(C)	Explain how training requirements are identified to ensure that personnel are competent in managing fatigue-related risk. Is this process documented? (show me)	
(D)	How is the effectiveness of FRMS training evaluated?	
(E)	When do employees receive FRMS training? What follow-up training on FRMS is provided by the organization and how do you determine who receives this training?	
(F)	Explain how and when FRMS training is provided to new employees.	
(G)	What do you consider to be human and organizational factors in the context of FRMS? Explain how this is included in FRMS training delivered to employees at all levels.	
	To the functional department heads:	
(A)	What fatigue awareness training do you have in place for employees? (Show me).	
(B)	What competency-based fatigue risk management training do you have in place for employees? Show me.	
(C)	Are you confident in your knowledge and understanding of FRMS and your role and responsibilities in respect to FRMS? Summarize the FRMS training you have received including the context, timing and intensity of each session.	
(E)	How often is FRMS training available to your employees? How do you determine who receives this training?	
(F)	What kind of FRMS training is provided to new employees? How soon after employment is it delivered?	
(F)	Was FRMS in place when you joined the organization? (if yes) How was FRMS presented to you when you joined the organization, and to what extent was it discussed as part of orientation? (if no) When did you first receive training about FRMS?	
(G)	What do you consider to be the human and organizational factors in the context of FRMS as it affects your department? Explain how this is included in FRMS training delivered to employees in your department.	
(G)	How were work environment, habits, procedures, workload and employee interaction discussed as part of the FRMS training you received?	

	To employees:
(A,B)	What sort of topics have you received training on in your fatigue awareness, and competency based fatigue risk management training?
(C)	Are you confident in your knowledge and understanding of FRMS and your role and responsibilities in respect to FRMS? What kind of FRMS training have you received? What was the context and intensity of these training session?
(E)	How accessible is FRMS training information to you? Do you know how management determines who receives training and when?
(E,F)	Was FRMS in place when you joined this organization? (if yes) How was FRMS presented to you when you joined the organization, and to what extent was it discussed as part of orientation? Discuss any further training since that initial session. If you wished to receive more FRMS training, how would you approach management about this issue? (if no) When did you first receive training about FRMS?
(G)	What do you consider to be human and organizational factors? Explain how this subject was addressed in the FRMS training you received.
(G)	How were your work environment, habits, procedures, workload and employee interaction discussed as part of your FRMS training?

Table A5—Documentation

	Component	5. Documentation
	Element	5.1 Identification and Maintenance of Applicable Regulations
	Questions:	
	To management:	
(B)	What is the procedure for identifying applicable regulatory requirements? Show me where this is documented.	
(BP)	How is pertinent technical and regulatory information accessible by personnel?	
(B)	How do you ensure that this documentation and information is in line with current regulations, standards, exemptions and labour laws?	
(BP)	In what way does the organization participate in regulatory development activities?	
	To employees:	
(BP)	Where would you find pertinent technical and regulatory information?	
(A,B)	How are changes in regulatory requirements built into operations?	

	Element	5.2 FRMS Documentation
	Questions:	
	To the accountable executive and functional department heads:	
(A,B)	Is there consolidated documentation that describes the FRMS and the interrelationship between all of its elements? (show me) Where else is this information located? What other documents, approved or otherwise incorporate reference to this information? (show me)	
(B)	How is this documentation made available to personnel?	
(D)	Where can employees find FRMS information at both the corporate and operational levels? (show me)	
(F)	How does documentation reflect functional coordination within the fatigue risk management system?	
(BP)	How/where does documentation show lines of authority, accountability and responsibility at the corporate level of management?	
(E)	What is the process for review of FRMS documentation over time?	
(E)	What is the process to identify changes within the organization that could affect organizational documentation?	
(BP)	How do you ensure that changes to organizational documentation have been implemented?	
	To employees:	
(A,B,BP)	Where can you find an explanation of the FRMS and the interrelationships between its elements? (show me)	
	Element	5.3 Records Management
	Questions:	
	To the functional department heads:	
(B)	What records are necessary in support of operational and regulatory requirements?	
(B)	Explain how these records are generated and retained for documentation and support of operational requirements.	
(B)	Explain how records are generated and retained for documentation and support of regulatory requirements.	
(B)	What is the process for ensuring operational and regulatory requirements are sufficiently supported?	
(B)	What are the FRMS control processes to ensure appropriate identification, legibility, storage, protection, archiving, retrieval, retention time and disposition of records? Justify the presence of these processes.	
(C)	What procedures are in place to ensure the FRMS is current, available and understood by all relevant personnel?	
(BP)	How long are records, not specifically required by regulations, kept? What is the policy for retaining records that are not specifically required by regulations?	
	To employees:	
(B)	What records are kept within your organization? Are these records sufficient to support operational requirements?	
(B)	What records and/or documentation are most useful in support of your responsibilities to operations? Is there a system in place to ensure you have or can easily obtain records and documentation when needed?	

APPENDIX B – EXPECTATIONS AND SCORING CRITERIA

Table B0—Criteria: Fatigue Risk Management System

Score	Criteria
1	The organization has no aspects of FRMS in place.
2	**(3) less some aspects**
3	(a) The organization has a FRMS, which has documented components that are established, maintained and adhered to. (b) The FRMS is appropriate to the size and complexity of the organization. (c) The organization has an FRMS that is implemented, maintained and effective.
4	**All of (3) plus some aspects of (5)**
5	**All of (3), plus all of the following:** • The organization is a recognized leader in FRMS within the aviation industry. • A single FRMS is established for holders of multiple operator's certificates with integrated operations. • The FRMS is coordinated with the FRMS of organizations providing services.

Table B1.1—Fatigue Risk Management Plan—Safety Policy

Score	Criteria
1	Senior Management does no demonstrate commitment to a FRMS. Fatigue Risk Management Policies are not well developed, and most personnel are not involved in FRMS.
2	**(3) less some aspects**
3	(a) A fatigue risk management policy is in existence and appropriate to the size and complexity of the organization. (b) The organization has based its fatigue risk management system on the fatigue risk management policy. (c) The fatigue risk management policy is approved by the accountable executive. (d) The fatigue risk management policy is promoted by the accountable executive. (e) The fatigue risk management policy is reviewed periodically. (f) The fatigue risk management policy is communicated to all employees with the intent that they are made aware of their individual safety obligations. (g) There is a clear declaration of commitment to managing fatigue-related risk. (h) The fatigue risk management policy states the organization's intentions, management principles and commitment to continuous improvement in managing fatigue-related risk. (i) Senior Management have a clear commitment to managing fatigue-related risk and demonstrates it through active and visible participation in the fatigue risk management system. (j) Personnel at all levels are involved in the establishment and maintenance of the fatigue risk management system. (k) The policy is implemented at all levels of the organization. (l) The policy is clearly visible to all personnel and particularly throughout the safety critical areas of the organization.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The policy is included in key documentation and communication media. • Senior managers clearly articulate the importance of managing fatigue-related risk when addressing personnel. • Verification that personnel have understood the message. • Commitment of the organization's senior executives to the development and ongoing improvement of the fatigue risk management system.

Table B1.2—Fatigue Risk Management Plan—Roles and Responsibilities

Score	Criteria
1	No formal designation of authorities, responsibilities and accountabilities exist for the fatigue risk management system. A management representative has not been appointed to ensure the FRMS is implemented. Fatigue risk management mandates are not widely disseminated and personnel's awareness of their role in the FRMS is limited.
2	**(3) less some aspects**
3	(a) A person has been appointed to manage the operation of the FRMS. (b) The person managing the operation of the FRMS fulfils the required job functions and responsibilities. (c) Fatigue risk management authorities, responsibilities and accountabilities are promulgated to all personnel in key documentation and communication media. (d) Fatigue risk management authorities, responsibilities and accountabilities of personnel and partners at all levels of the organization are defined and documented. The role of the Certificate Holders, Applicant and Delegate should also be defined where applicable. (e) There are documented organizational diagrams, including names, positions, specific FRMS responsibilities and duties and job descriptions. (f) Fatigue risk management imperatives are clearly described in senior management duties and responsibilities. (g) Evidence that FRMS procedures have penetrated all levels of the organization. (h) All personnel understand their authorities, responsibilities and accountabilities in regards to all fatigue risk management processes, decisions and actions.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • Fatigue risk management authorities, responsibilities and accountabilities are reviewed after any significant organizational change. • There is clear evidence that the accountable executive not only understands that he or she has ultimate responsibility for fatigue risk management within the organization, but that he or she demonstrates this commitment on a daily basis. • There is a logical flow within organizational authorities, responsibilities and accountabilities for fatigue risk management. • Senior management recognizes the significance of contributions from all levels of the organization for the establishment and maintenance of the system. • Employee involvement and consultation arrangements are documented. • Employee sign-off on FRMS policy and procedures document stating they have understood and agree to apply the FRMS to their work practices.

Table B1.3—Fatigue Risk Management Plan—Communication and Consultation

Score	Criteria
1	The general exchange of information throughout the organization does not permit the FRMS to function effectively. The organizational communication network does not include all personnel, out-stations and outsource functions. Organizational personnel are not consulted regarding FRMS operation or review.
2	**(3) less some aspects**
3	(a) There are communication processes in place within the organization that permit the FRMS to function effectively. (b) Communication processes (written, meetings, electronic, etc.) are commensurate with the size and scope of the organization. (c) Information is established and maintained in a suitable medium that provides direction in related documents. (d) There is a process for the dissemination of fatigue risk management information throughout the organization and a means of monitoring the effectiveness of this process.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • Organization wide, uncomplicated, reciprocal communication and consultation related to fatigue risk management issues are plainly evident. • All areas, including out-stations and outsource functions, are included in the communication and consultation network of the organization. • There is an established means of inter-departmental communication to spread information on FRMS related matters. • There exists a formal means of communicating with experts in FRMS so that advice can easily and quickly be obtained by personnel. The documentation should indicate where these experts could be located. • All personnel are informed as to who is their primary contact for fatigue related matters. • There is a process for communication strategy that includes electronic communication, frequent meetings, FRMS award systems, employee recognition system, FRMS bulletins, etc. • There is a process for sharing fatigue related information with outside sources that might be impacted by this information. • Organizational personnel are actively involved in determining details of FRMS operation and review.

Table B2.1—FRMS Controls—Work Hours & Sleep Opportunity

Score	Criteria
1	There is no system in place to monitor sleep opportunity and hours of work.
2	**(3) less some aspects**
3	(a) Work scheduled and rosters are planned and recorded for easy access by the organization, employees and TCCA. Controlled copies are kept on file in chronological date order by the accountable executive. (b) Actual work hours are recorded and are easily accessible by the organization, employees and TCCA. They are simply coded for ease of understanding. Records should include the employee name, type of work being performed (e.g. trip log, type of maintenance duties, etc.), start and finish time of shift, and the date. Controlled copies of actual work hours are kept on file in chronological order by the accountable executive. (c) The organization has a validated process or system for ensuring that both planned and actual work hours provide sufficient sleep opportunity for employees. (d) All planned work schedules and rosters are analyzed for sleep opportunity prior to releasing them to employees. (e) A sample of worst-case actual work hours are analyzed for sleep opportunity at minimum on a monthly basis (see note). (f) Reporting systems and required actions upon discovering insufficient sleep opportunity within a given roster are clearly defined (see note). (g) All analyses are documented, reported and kept on file in chronological order for review by the organization, employees and TCCA. (h) Employees are provided with guidelines of what they are expected to do if their shift runs over their rostered period to ensure they still obtain sufficient sleep opportunity. (i) The process or system for assessing sleep opportunity is reviewed on a regular basis to ensure it is operating effectively.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • Work schedules and rosters are recorded in a manner that is easy to understand by the organization, employees and TCCA. • They are simply coded for ease of understanding. • Employees are consulted about work schedules and rosters. Names and dates of those present during the consultation are recorded and kept on file. • The organization risk manages maximum amounts of work performed by any employee. • The organization has a program that ‘flags’ rosters, schedules and actual work hours that have provided employees with insufficient sleep opportunity. • There is evidence of reports that have been generated and circulated to relevant managers and employees when actual work hours were shown to have provided insufficient sleep opportunity. • There is a management process in place to ensure that all casual employees and contractors are obtaining sufficient sleep opportunity.

Note:
The most extreme work hours should be selected and analyzed using fatigue modeling software. Examples of extreme work hours would include long work shifts, more than 2 night shifts worked in a row, more than 2 early morning starts in a row, breaks of 12 hours or less between shifts, long blocks of shifts and few days off. If these analyses indicate that sufficient sleep opportunity was provided, with a fatigue score within an appropriate pre-defined range, it can be assumed that the remainder of work shifts will also be compliant. If any of the analyses indicate insufficient sleep opportunity was provided, the organization should have documented actions to prevent reoccurrence, and further analyses of other recorded work hours should be undertaken to determine the extent of the problem.

Note:
For example, if an analysis of planned rosters indicates the employee (s) will receive insufficient sleep opportunity, there should be a clear process to report the analysis results, and documented actions to either manage the risk of elevated fatigue likelihood, or to change the roster to ensure the employee (s) does get sufficient sleep opportunity. Similarly, if retrospective analysis of work hours indicates an employee (s) received insufficient sleep opportunity, there should be a clear process to document the results, and take action to prevent the likelihood of reoccurrence.

Table B2.3—FRMS Controls—Personal Fitness for Duty—Prior Sleep and Wake

Score	Criteria
1	There is no system in place to monitor actual sleep obtained by employees and relative fitness for duty. Employees are not informed of minimum sleep requirements to be fit for work.
2	**(3) less some aspects**
3	(a) The organization has a set of validated parameters defining minimum sleep and maximum wake thresholds required for the average employee to be considered fit for work. (b) There is evidence of employee consultation during the development and review of these parameters. (c) The prior sleep and wake thresholds are reviewed periodically to determine whether they are effective. (d) Reporting procedures are clearly defined for occasions when employees obtain insufficient sleep or experience extended wakefulness. Employees are provided with guidelines of what they are expected to do in these circumstances. (e) Prior sleep and wake data is taken into account during the FRMS review and audit process. (f) Reports of insufficient sleep are dealt with in a just manner.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The organization has an employee assistance program in place to refer employees who consistently have trouble obtaining sufficient sleep. • Employees actively discuss action plans with a supervisor prior to commencing any work after obtaining insufficient sleep. • The organization documents actual sleep records for all employees on a regular basis for review and audit purposes. • The organization has provided easy reference tools for employees to determine whether they have obtained sufficient sleep.

Table B2.3—FRMS Controls—Personal Fitness for Duty—Symptoms and Behaviours

Score	Criteria
1	There is no system in place to monitor fatigue-related symptoms and behaviours. No training or education has been provided to employees to assist them in identifying fatigue-related symptoms and behaviours.
2	**(3) less some aspects**
3	(a) The organization has provided easy reference tools for employees to assess fatigue-related symptoms and behaviours. (b) Reporting procedures and required actions are clearly defined for occasions when employees exhibit fatigue-related symptoms, or observe fatigue-related symptoms in a colleague. (c) Reports of fatigue-related symptoms and behaviours are dealt with in a just manner. (d) Fatigue-related symptom and behaviour data is collected from employees on a periodic basis for review and audit purposes.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • Employees actively discuss action plans with a supervisor prior to commencing any work when experiencing significant fatigue-related symptoms and behaviours. • Peer and supervisor monitoring for fatigue-related symptoms that may indicate performance impairment is actively promoted within the organization. • The organization has a sleep-disorder screening program in place for employees who exhibit fatigue-related symptoms and behaviours on a regular basis (see note).

Note:
Common sleep disorders the organization may screen for (and refer for treatment) include sleep apnea, restless leg syndrome and insomnia.

Table B2.4—FRMS Controls—Fatigue Proofing Strategies

Score	Criteria
1	There are no defined fatigue proofing strategies for use by employees within the organization.
2	**(3) less some aspects**
3	(a) The organization has a set of clearly defined fatigue proofing strategies for use by employees when experiencing mild or moderate levels of fatigue. (b) There is evidence of employee consultation in defining the use of fatigue proofing strategies. (c) The availability of fatigue proofing strategies is decided using a risk-based process. (d) Employees receive competency-based training about the use and application of fatigue proofing strategies. (e) Fatigue proofing strategies are periodically reviewed to determine their effectiveness.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The organization has quiet, temperature controlled napping facilities available for employees. • The organization has a napping policy, describing where and when to nap, as well as the caution required when suffering from sleep inertia. • The organization provides individual assistance to employees who regularly suffer from fatigue and require regular use of fatigue-proofing strategies. • The organization consults fatigue risk management experts to discuss the effectiveness of fatigue-proofing strategies in different circumstances.

Table B3.1—Fatigue Risk Management Oversight—Hazard Identification and Reporting Processes

Score	Criteria
1	The reporting processes do not ensure the capture of fatigue-related information, nor do they promote voluntary reporting of observed fatigue-related occurrences or deficiencies. Fatigue-related reports are not reviewed at the appropriate level of management.
2	**(3) less some aspects**
3	(a) The FRMS reporting system is non-punitive. Employees are promoted to report any fatigue-related hazard or event without fear of unfair retribution. (b) The organization has a process or system that provides for the capture of fatigue-related information including fatigue-related hazards, fatigue occurrences, incidents, accidents or other data relevant to the FRMS. (c) The reporting system is simple, accessible and commensurate with the size of the organization. (d) Reports are reviewed at the appropriate level of management. (e) There is a feedback process to notify contributors that their reports have been received and to share the results of the analysis. (f) There is a process in place to monitor and analyze trends documented. (g) The organization has planned self-evaluation processes, such as regularly scheduled reviews, evaluations, surveys, operational audits and assessments. (h) The organization has identified primary sources of information for fatigue risk assessment, including reports from employees, accident and incident data, performance on flight data monitoring programs (FDM) or Line Operations Safety Audits (LOSA), reports of fatigue-related symptoms and behaviours, individual sleep and wake data from employees, and analysis of rosters and actual work hours. (i) The organization has documented corrective and preventative actions to respond to event analysis. (j) There are data collection processes throughout the safety critical areas of the organization to permit organization wide analysis of fatigue risk management issues. (k) There is a process in place to investigate and analyze reported events. (l) Corrective and preventative actions are generated in response to hazard and event analysis. (m) The organization conducts formal hazard analyses for: • Introduction of new shift/roster systems • Introduction of new long range or ultra long range operations • Long duty hours for maintenance personnel • Changes in manning for high-risk tasks • Any work being performed between 2100hrs and 0600hrs

4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The organization has a process in place to ensure confidentiality as requested. • The range and scope of fatigue related hazards, occurrences or deficiencies that must be reported are explained and defined. • There is a process to ensure that information contained in reports is validated for accuracy prior to analysis. • All reports are subjected to a risk analysis process to determine the extent and priority of further action. • Personnel involved in the reporting process are empowered to suggest corrective actions. • The report form(s) is (are) simple, standardized and accessible across the organization. • There is a process to ensure that information is received from all areas of the organization within the scope of the FRMS. • Participation in industry, operational and fatigue risk management activities such as conferences, symposia and other fatigue-related meetings is a priority.

Table B3.2—Fatigue Risk Management Oversight—Investigation and Analysis

Score	Criteria
1	The organization does not routinely conduct investigation and analysis of fatigue-related occurrences and deficiencies.
2	**(3) less some aspects**
3	(a) There are procedures in place for the conduct of investigations (Part V & VII only). (b) Measures exist that ensure all reported occurrences and deficiencies are investigated. (c) There is a process to ensure that occurrences and deficiencies reported are analyzed to identify contributing and root causes. (d) Corrective and preventative actions are generated in response to event investigation and analysis. (e) The organization has a staff of technically competent investigators commensurate with the size and complexity of its operation. (f) When identifying contributing and root causes, the organization considers multiple aspects of how fatigue may have been related. (g) Results of the analysis are communicated to the responsible manager for corrective/preventative action and to other relevant managers for their information. (h) All reactive reports are subjected to a risk analysis process to determine the extent and priority of further action. (i) Responsibility and timelines are established for each corrective action.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • Where fatigue is found as a contributing factor or root cause of an error, incident, or accident. • Investigation results are collated and shared with the wider aviation community.

Table B3.3—Fatigue Risk Management Oversight—Risk Management

Score	Criteria
1	The organization does not have a process for evaluating and managing fatigue related risk.
2	**(3) less some aspects**
3	(a) There is a structured process for the assessment of fatigue-related risk associated with identified hazards, expressed in terms of severity, level of exposure and probability of occurrence. (b) There are criteria for evaluating fatigue-related risk and the tolerable level of risk the organization is willing to accept. (c) The organization has risk control strategies that include corrective/preventative action plans to prevent recurrence of reported occurrences and deficiencies. (d) The organization has a process for evaluating the effectiveness of the corrective/preventive measures that have been developed. (e) Corrective/preventive actions, including timelines, are documented. (f) There is a fatigue risk classification system that guides the organization in developing fatigue related risk control strategies. (g) The organization uses its fatigue risk assessment results to develop best practice guidelines that it shares with the industry. (h) The results of the fatigue risk assessment program are built into the organization's methods and procedures. (i) The organization is able to demonstrate the fatigue risk management process through records and is able to show periodic review documentation.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The organization runs formal fatigue risk management workshops with all personnel performing safety-critical tasks. • The organization has developed key performance indictors to evaluate their FRMS and determine whether fatigue-related risk has increased or decreased over periodic risk assessments

Table B4.1—Training: Training, Awareness and Competence

Score	Criteria
1	Training requirements are not documented, nor does the organization incorporate FRMS training into indoctrination training.
2	**(3) less some aspects**
3	(a) The organization has a Fatigue Risk Awareness training program in place that covers: • A basic overview of sleep, why we need it, and what happens if we don't get it; • Definition of fatigue and fatigue-related risk; • Examples of the consequences of fatigue, including performance, health and lifestyle factors; • An overview of the reasons why fatigue-related risk needs to be managed—including legal liabilities; • Personal fatigue risk management strategies—such as sleep hygiene, lifestyle, diet, stimulants, exercise and relaxation. (b) The organization has a competency-based Fatigue Risk Management training program in place that covers: • A synopsis of the information covered in fatigue risk awareness training; • An overview of the organization's FRMS; • Organizational and individual responsibilities in managing fatigue-related risk; • A detailed explanation of each of the FRMS controls and management strategies; • Fatigue-Reporting systems and expectations; • Fatigue-risk management problem shooting (c) There is a documented process to identify training requirements so that personnel are competent to manage fatigue related risk. (d) There is a validation process that measures the effectiveness of training. (e) The training includes initial, recurrent and update training as applicable. (f) The organization's fatigue risk management training is incorporated into indoctrination training upon employment. (g) Training includes human and organizational factors.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • There is a formal and objective training needs analysis. • Training requirements are documented for each area of activity within the organization, including areas where training requirements are not defined by regulations. The attendance of symposiums outside of FRMS should also be considered.

	• A training file is developed for each employee, including management, to assist in identifying and tracking employee training requirements and verifying that the personnel have received the planned training. This file should be completed in accordance with the training guidelines that are developed. • Training needs are included as part of the performance appraisal process. • Management recognizes and uses informal opportunities to instruct employees on fatigue risk management. • Continued occupational competency is maintained. • Evidence exists that management supports fatigue risk management training initiatives. • The training exercises and methods are kept current to reflect new techniques, technologies, results of investigations and corrective actions and regulatory changes. • The organization keeps an up-to-date fatigue risk management library for employee access.

Table B5.1—Documentation—Identification and Maintenance of Applicable Regulations

Score	Criteria
1	There is no system for the identification and maintenance of applicable fatigue-related regulations.
2	**(3) less some aspects**
3	(a) A documented procedure has been established and maintained for identifying applicable fatigue-related regulatory requirements (parts VI, VII only). (b) Fatigue-related regulations, standards, exemptions and labour laws are periodically reviewed to ensure that the most current information is available (parts VI, VII only).
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • All pertinent fatigue-related technical and regulatory information is readily accessible by personnel. • The organization has defined specific triggers that would lead to a review of the organizational documentation.

Table B5.2—Documentation—FRMS Documentation

Score	Criteria
1	FRMS documentation is incomplete and maintenance procedures are not well established.
2	**(3) less some aspects**
3	(a) There is consolidated documentation that describes the FRMS and the interrelationship between all of its elements. (b) This information resides or is incorporated by reference into approved documentation, such as DAPM/EPM, Organization Operations Manual, Maintenance Control Manual, as applicable, and where these approved documents are not required by regulation, the organization includes the information in a separate, controlled document. (c) Manuals or controlled electronic media are used to document the system. (d) The consolidated documentation is readily accessible by personnel. (e) There is a process to periodically review FRMS documentation to ensure its continuing suitability, adequacy and effectiveness, and that changes to organizational documentation have been implemented. (f) Documentation reflects functional coordination within the management system that ensures the organization works as a system and not as a group of separate or fragmented units.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The system is documented in suitable organizational media at both corporate and operational levels. • Documents show lines of authority, accountability and responsibility at the corporate level of management. This documentation also indicates the authority within the Organization and the authority granted by the regulator. • Acceptable means of documentation include, but are not limited to, organizational charts, job descriptions and other descriptive written material that define and clearly delineate the system of authority and responsibility within the organization for ensuring safe operation. • The organization has a process to identify changes within the organization that could affect Organizational documentation.

Table B5.3—Documentation—Records Management

Score	Criteria
1	There are no processes in place for managing FRMS output.
2	**(3) less some aspects**
3	(a) The organization has a records system that ensures the generation and retention of all records necessary to document and support FRMS requirements, and is in accordance with applicable regulatory requirements. (b) The system shall provide the control processes necessary to ensure appropriate identification, legibility, storage, protection, archiving, retrieval, retention time, and disposition of records. (c) Master copies of current FRMS policy and procedures documents contain a page with signatures of all relevant personnel stating they have read and understood the document.
4	**All of (3) plus some aspects of (5)**
5	**All of 3, plus all of the following:** • The organization has a policy that defines how long FRMS records that are not specifically required by regulations are kept.

APPENDIX C – ASSESSMENT REPORT TEMPLATE

Component	Element	CAR Compliant	Element Score	Component Score
1. Fatigue Risk Management Plan	1.1 Fatigue Risk Management Policy	Y / N		
	1.2 Roles, Responsibilities and Employee Involvement	Y / N		
	1.3 Communication and Consultation	Y / N		
		Total :	+3 →	

Component	Element	CAR Compliant	Element Score	Component Score
2. Fatigue Risk Management Controls	2.1 Work hours & Sleep Opportunity	Y / N		
	2.2 Personal Fitness for Duty—Prior Sleep and Wake	Y / N		
	2.3 Personal Fitness for Duty—Symptoms and Behaviours	Y / N		
	2.4 Fatigue Proofing Strategies	Y / N		
		Total :	+4 →	

Component	Element	CAR Compliant	Element Score	Component Score
3. Fatigue Risk Management Oversight	3.1 Hazard Identification and Reporting Processes	Y / N		
	3.3 Investigation and Analysis	Y / N		
	3.4 Risk Management	Y / N		
		Total :	+3 →	

Component	Element	CAR Compliant	Element Score	Component Score
4. Training	4.1 Training, Awareness and Competence	Y / N		
		Total :	+1 →	

Component	**Element**	CAR Compliant	**Element Score**	**Component Score**
5. Documentation	5.1 Identification and Maintenance of Applicable Regulations	Y / N		
	5.2 FRMS Documentation	Y / N		
	5.3 Records Management	Y / N		
		Total :	+3 →	

Component Score Total: **Overall FRMS Score** (Component Score Total / # of Components)	

* Optional for CAR 705 Operations ** Optional for CAR 573 Operations