DEVELOPING AN INTEGRATED FATIGUE RISK MANAGEMENT PROGRAM

A Comprehensive Checklist for Helicopter Operators to Ensure Compliance, Standardization, and Safety Management System Integration

This document was prepared by the United States Helicopter Safety Team (HSE 23-04 Working Group).

USHST
United States
Helicopter Safety Team

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Note to Reader

This document serves as a Recommended Practice (RP) published in a checklist format under the direction of the U.S. Helicopter Safety Team (USHST). It is intended to be a medium for discussion and practical application of aviation operational safety pertinent to all Part-135 helicopter operations conducted in the United States. As an RP, it is not intended to replace individual engineering or corporate judgment, nor to take the place of instruction in company manuals. Each organization is responsible for deciding on how to incorporate this RP in its own operation.

In this checklist the word “shall” is used to indicate high value safety practices, not an imperative command. Accordingly, “shall” may be interpreted as “should.” At the same time, operators choosing to adopt practices recommended in this document should be aware that substitution of “should” for “shall” may diminish the effectiveness of the practices.

Where the Checklist is used as an alternative to prescriptive fatigue management limits (e.g., exceeding certain duty/rest requirements), shall’ elements become mandatory for demonstrating an equivalent or better level of safety.

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Preface

About this Document

This checklist represents a key safety initiative for U.S. helicopter operators and supporting agencies. It is intended to help organizations develop and implement a Fatigue Risk Management Program (FRMP) in their air operation, supporting alignment with applicable federal regulations (e.g., 14 CFR § 121.495, § 117.7) in accordance with industry standards (e.g., ICAO Doc 9966, FAA Advisory Circular 120-103A), accreditation sources and shared best practices.

Whether an organization is large or small and planning to develop a new FRMP or seeking to make improvements to an existing program, it can use this resource as a means of standardization, compliance, and conformance. Consideration in its design and application has been made for operators with minimal numbers of aircraft, management personnel, and crew members.

Included in this checklist are implementation details for the unique roles of pilots, flight crew, aviation maintenance technicians, and communications specialists. Flight crew includes but is not limited to roles such as medical crew, flight engineers, tactical operators, rescue personnel, loadmasters, or communication controllers—and can be substituted as appropriate.

The checklist also covers the shared responsibility of organizational management and leadership to ensure that the FRMP is prioritized, adequately resourced, and duly followed. While this checklist covers all essential components of an FRMP, each operation is different; organizations will need to tailor the core components to their own specific needs and operating characteristics.

USHST encourages and welcomes suggestions to improve or update the content and best practices contained within. Please email your feedback to the USHST HSE 23-04 Working Group at info@pulsarinformatics.com.

How to Use the Checklist

This checklist is intended to serve as a blueprint in the development of a comprehensive fatigue risk management program, encompassing fatigue hazards stemming from both operating and non-operating factors. Its practical utility within a given organization depends on the specific context: the state of the current approach to managing fatigue risk, the status of the existing Safety Management System (SMS) and Quality Management System (QMS), the preparedness of the organization to invest in new safety initiatives, etc. However, the USHST working group has made a concerted effort to ensure that the recommended practices, techniques, and tips presented herein are universally applicable across all Part-135 operators.

The subpart sections and supporting elements in this checklist are set forth in a logical sequence that mirrors the steps an organization would take to devise, develop, and implement an FRMP from beginning to

end. However, since each subpart is written as a discrete topic area, the reader may easily delve into the checklist in any order.

Customization is encouraged within the contours of the elements set forth in this checklist to support alignment with the organization's own strategies, resources, and priorities. At the same time, it is stressed that none of the elements are optional; in order to assert compliance with the checklist and conformance with industry and regulator advisories, an operator must implement the full scope of an FRMP as prescribed in this checklist. Any decision to exclude a specific element must be accompanied by one of the following reasons, documented in writing:

1. The element is **not applicable** to the operation;
2. An **alternative** means of compliance subsumes the element; or
3. The operator takes **exception** to implementing the element (with justification provided)

This checklist is supported by a continuous improvement tool labeled as the FRMP Crosswalk Matrix (Annex 1), which accompanies this document and offers recommended regulatory and industry resources for further reference. The related fatigue risk management guidance may be used to strengthen the FRMP beyond minimum compliance standards or to assist with audit activities and continuous improvement steps.

Expectations Framework

The design of this document is broken down into subparts with each containing subsections with three common sections – a leading **Question** intended to provoke creative focus on the topic relative to the operation's current and intended state of the FRMP, **Development** guidelines intended to aid in a comprehensive construct, **Implementation** courses of action to effectuate the subpart section(s) and provide the accepted compliance standards, and in some cases **Notes** to provide additional context to the question and/or the development and implementation sections.

This document uses the FAA's Tips–Techniques–Evidence framework to distinguish the level of formality and expectation associated with each checklist element. **Tips** provide supplemental information to clarify or enhance the description of an element. **Techniques** describe recommended, repeatable methods that represent FAA-recognized good practice while still allowing operators to use alternative approaches. **Evidence** identifies the objective, verifiable artifacts an operator should be able to produce to demonstrate that a requirement is being met. Together, these categories clarify the difference between helpful advice, accepted methods, and demonstrable compliance, allowing organizations of varying size and complexity to adopt practices appropriate to their operations while maintaining alignment with the checklist.

An FRMP must demonstrate equivalence or better safety than prescriptive limits when exceeding them.

In this document, tips, techniques, and evidence appear inside a text box marked with a unique icon corresponding to each:

Introduction

What is a Fatigue Risk Management Program?

Fatigue is a significant hazard that has implications for the safety of air operation personnel, customers, and the general public. A Fatigue Risk Management Program (FRMP) employs multi-layered defensive strategies (barriers) to manage fatigue risks that may originate from a variety of sources (hazard areas). Barriers consist of data-driven, ongoing, adaptive processes that can identify fatigue hazards as they appear, trigger notifications, perform risk assessments, implement risk controls, and monitor effectiveness. A successful FRMP allows an organization of any size—from a small, single-base operation to a large national network—to manage the related risks and conduct operations more safely while retaining operational flexibility.

An FRMP provides a solid footing for continuous safety performance improvement, identifying and addressing fatigue factors as they evolve over time amid varying individual physiological characteristics and changing operational circumstances. The objective of the FRMP is to manage, monitor, and mitigate the effects of fatigue to improve key member alertness and reduce performance errors. As a data-driven system, an FRMP requires data collection and analysis practices and the protections of non-punitive reporting of any issues related to fatigue.

There is a functional similarity between an FRMP and an SMS (SMS); typically, the former should operate within the framework of the latter and align with a QMS (QMS), if present.

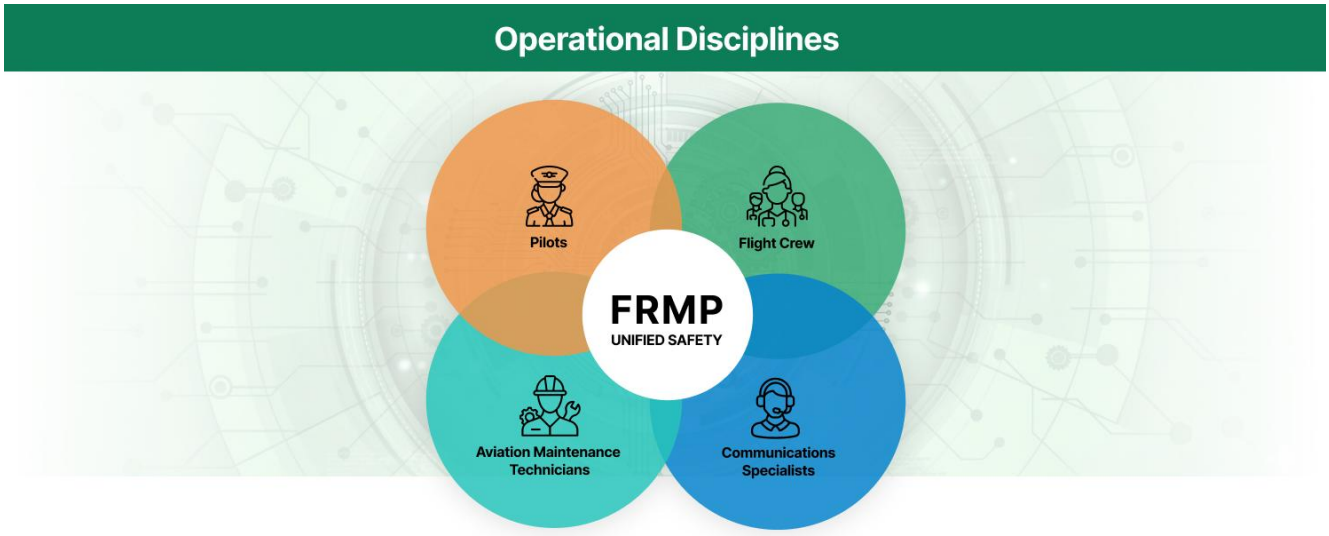
An FRMP may operate under prescriptive fatigue management regulations or as a performance-based Fatigue Risk Management System (FRMS) approved as an alternative means of compliance.

What is the difference between an FRMP and an FRMS?

<table>
<tr><td colspan="2">In terms of requirements,</td></tr>
<tr><td>FRMP</td><td>FRMS</td></tr>
<tr><td>FRMP policies and procedures are designed within a regulatory structure</td><td rowspan="2">Unlike an FRMP, an FRMS is optional, a nonprescriptive fatigue mitigation tool that minimizes the acute and chronic sources of fatigue within a specific operation</td></tr>
<tr><td>FRMP provides a basic foundation for the development of an FRMS; however, the contents of a FRMP do not meet all the requirements for an FRMS</td></tr>
<tr><td colspan="2">In terms of architectural design,</td></tr>
<tr><td>An FRMP is an air carrier’s management plan outlining policies and procedures for reducing the risks of flightcrew member fatigue and improving flightcrew member alertness</td><td>FRMS is a performance-based, data-driven and scientific process that allows for continuous monitoring and management of safety risks associated with fatigue-related error</td></tr>
<tr><td>The FRMP structure is composed of individual components that serve as the framework, and each component interacts with the other components of the plan to achieve the objective of the FRMP & FRMS</td><td>The FRMS leads to continuous safety enhancements by identifying and addressing fatigue factors across time and changing physiological and operational circumstances associated with a specific operation</td></tr>
<tr><td>A FRMP is an air carrier’s management plan outlining policies and procedures for reducing the risks of flightcrew member fatigue and improving flightcrew member alertness</td><td>The FRMS is a part of a repetitive performance improvement process aligned with adjacent systems (e.g., SMS, QMS)</td></tr>
</table>

Subpart A – General

A.1 Applicability



Question	☐ Where will the FRMP apply within the organization?
Development	☐ Conduct a scoping exercise to identify all operational domains where fatigue risk may arise and could have significant consequences if unaddressed. Listed below are examples of the potential consequences of elevated fatigue levels in the four operational disciplines illustrated in the figure above: • **Pilots**: reduced situational awareness, slower reaction time • **Flight Crew**: reduced decision-making capacity during flight-related tasks • **Aviation Maintenance Technicians**: errors in maintenance tasks and increased potential for quality escapes • **Communications Specialists**: missed or incorrect communications, misinterpretation of data, delayed responses ☐ Consider operational demands that impact multiple areas of the organization as well as operational demands that are unique to each discipline working within those areas or in concert with them.

	☐ Consider the impact of the operating environment. Here are some examples of environmental factors that may compound fatigue risk: • Heat and cold stress • Weather hazards (IMC, thunderstorms, lightening) • Limited daylight • High-density airspace • Demanding geography (mountains, overwater flight, etc.) • Workload intensity over short or long periods of time • Physical activity (intense exertion, sedentary ergonomics, etc.) • Remote operating locations (long commute times, time zone changes)
	☐ Consider the scale and complexity of the operation. Some examples of operational factors that may affect the degree of fatigue risk experienced by workers include: • Significant variability in duty period start times • Tempo of operations • Availability of other personnel that can serve as backup • Available aircraft types and equipment (avionics, configuration) • Available base facilities (i.e., does the break room have soundproof walls, blackout blinds, lie-flat beds, etc.) • Culture (corporate, base, crew)
Implementation	☐ Document the operational disciplines that will be covered by the FRMP in the statement of management commitment (section B.1).

A.2 Definitions

Note	☐ Standard definitions of general terms related to fatigue risk management in aviation (e.g., fatigue, circadian phase) may be sourced from FAA, ICAO, accreditation organizations, and other relevant

	industry authorities. For specialized terms or for definitions tailored to a specific air operator type, consult sources with expertise implementing fatigue risk management programs in similar operational settings.
Development	☐ Compile a glossary of key terms aligned with 14 CFR § 117.3, ICAO Annex 6, and AC 120-103A. Use as a resource that may be included in SMS documentation. ☐ Compile a list of acronyms used by the operation in business workflows applicable to safety and quality management. Consult the list of acronyms in the organization's Operations Manual and SMS documentation. ☐ Tailor definitions of key terms and acronyms to the size, scope, and complexity of the operation. Listed below are examples of terms that may have operator-specific definitions, along with questions for consideration. • **Flight duty period**: When exactly does it begin? When does it end? How are split duty periods treated? • **Maintenance duty**: Are inspection tasks included in addition to repair tasks? Is overtime considered part of the maintenance duty period or treated separately? • **Rest period**: Is time spent commuting to or from the base included or excluded? Is time spent on standby allowed? Are any work-related activities permitted during a rest period? • **Shift handover**: What precise event or action constitutes the end of one individual's duty period and the commencement of their replacement's duty period? • **Workload**: What quantitative or qualitative metrics are used to measure the burden of a given duty period? Are prolonged, sedentary periods considered to contribute to increased workload?

While many terms have a commonly accepted meaning, the unique characteristics of the operation may warrant the addition of details to the definitions of key terms to ensure they are relevant and useful.

Implementation

- [ ] Validate definitions of key terms and acronyms with representatives from each operational discipline to ensure they are clear and unambiguous.
- [ ] Document the list of validated key terms and acronyms into a formal glossary. The glossary shall be appended to the FRMP Manual (section 0).
- [ ] Periodically update the glossary to reflect any changes in general requirements (section A.3).

A.3 General Requirements

Questions

- [ ] What are the best practice conformance objectives with respect to advisories and requirements set out by the regulators?
- [ ] What are the best practices set out by industry accreditation and licensing organizations, and the operator's safety culture?

Development

- [ ] Identify the applicable federal regulations with which the FRMP shall conform. Identify industry accreditation requirements (i.e., CAMTS), and industry standards (e.g., IOGP, USHST, BARS, UPAC) with which the FRMP shall comply.
- [ ] Consider obtaining guidance from sources considered experts in implementing FRMPs for similar organizations. Additional sources of information are provided in 0 of this document. Of note, reference ICAO

Annex 6 Part III (International Operations – Helicopters) where applicable for international operations.

- ☐ Align the list of new requirements with those requirements that are already codified in the Operations Manual, SMS and QMS to avoid redundancy and clarify potential conflicts.
- ☐ Work with representatives from each operational discipline to ensure the new requirements are practical and applicable to the size, scope, and complexity of the operation.

Utilize the Crosswalk Matrix to serve as a comprehensive guide to all applicable requirements (see Annex 1).

Implementation

- ☐ Create a policy statement that identifies specific requirements that will form the FRMP purpose, objectives and expectations for the organization. Publish this document in line with the Policies section of the FRMP Manual.
- ☐ Conduct periodic compliance and conformance audits to ensure the FRMP continues to meet the policy requirements. If any alternate mode of compliance is used with respect to one or more specific requirements, create a safety case that encompasses the following elements at a minimum:
  - Description of the operation that requires a variance from the applicable requirements
  - List of the applicable requirements from which the operation varies
  - Justification for why the variance is necessary
  - Risk assessment of the alternate mode of compliance
  - Description of the operational data and fatigue and alertness performance data to be collected during the variance operation to monitor for fatigue hazards
  - Safety performance indicators that will be used to assess fatigue risk, together with applicable thresholds for acceptable risk level

- Level of management determined to accept the associated risk

☐ Periodically review applicable federal regulations, industry accreditation requirements, and industry standards for changes relevant to the operation. Update the compliance objective policy statement accordingly.

Provide a current copy of the policy document signed by the Accountable Executive, as well as a copy of all compliance and conformance audit results for the previous three years.

Subpart B – Foundations

B.1 Management Commitment and Leadership Oversight

Question	☐ If an SMS is implemented, what steps if any will be required to add leadership oversight and influence managers' commitment to the FRMP? If not, consider synchronous strategies for both the SMS and FRMP.
Development	☐ Confirm that the organization's leadership has budgeted for the investment of time and financial resources necessary to implement the FRMP. ☐ Create a statement of management commitment to the FRMP that includes the following items: • Affirmation of the organization's commitment to safe operations • Acknowledgement that fatigue is a safety hazard that can contribute to accidents or incidents • Expectations of managers at every level • List of the operational domains that shall fall within the scope of the FRMP (section A.1) • Declaration of commitment to devote resources to support the goals and principles of fatigue risk management within these operational disciplines on an ongoing basis • Designation of the individual (e.g., Safety Manager) who will assume overarching responsibility for the implementation and management of the FRMP • Signature of the Accountable Executive
Implementation	☐ Confirm with the Safety Manager (or their designee) that they understand and accept responsibility for overseeing the implementation of the FRMP. ☐ Appoint an individual from each operational discipline within the scope of the FRMP to act as a subject matter expert (SME) of their discipline in

the FRMP development and implementation process. This group of individuals, together with the Safety Manager and additional stakeholders (e.g. FAA representatives, consulting experts, if applicable), will constitute the implementation committee.

- ☐ Estimate the annual cost of operating the FRMP once implementation is complete. Communicate this estimate to the organization's finance department to ensure it is included in future budget planning.
- ☐ Obtain leadership's approval for specific budget items within the current fiscal period that cover the anticipated direct and indirect costs of implementing the FRMP.
- ☐ Convene quarterly meetings with leadership to: (1) provide a briefing on how the FRMP implementation is progressing, and, once it is active, (2) share audit findings and measures of the effectiveness of the FRMP and (3) evaluate the degree to which the FRMP is achieving the organization's strategic objectives and those cited in the FRMP policy.

Provide a document listing the individuals appointed to the FRMP Implementation Committee. Be prepared to provide minutes from committee meetings and notes from quarterly briefings to leadership.

B.2 Responsibilities of Managers and Operational Disciplines

Questions

- ☐ What are the specific responsibilities of manager roles and operational disciplines in the FRMP?

☐ Does operational impact generate from front line upwards to the Accountable Executive, and strategic influence from there down the front line operator?

Notes

☐ The role titles in this section are only suggestions; each organization is encouraged to use its own role titles in keeping with its existing organizational structure, Operations Manual, and SMS.

☐ The responsibilities listed below are not confined to the stated role and do not constitute an exhaustive list. The specific responsibilities of personnel responsible for safety at a given organization may vary depending on the size, scope, and complexity of the operation.

Development

☐ Identify specific responsibilities for each manager role and operational discipline within the scope of the FRMP. Align with the responsibilities set forth in the Operations Manual and SMS. Consult with the operational discipline representatives serving on the implementation committee (section B.1). Roles commonly found in an air medical transport operation are listed below together with examples of their responsibilities.

☐ Accountable Executive

- Provide strategic leadership and oversight of the FRMP
- Ensure the FRMP meets its compliance and conformance objectives (section A.3) and initiate corrective actions , where necessary
- Allocate the financial and human resources required for the successful implementation and management of the FRMP
- Endorse the organization's safety performance objectives (section 0), fatigue risk management policies (Subpart C) and rules (section C.2)
- Exercise executive authority for the compliance of the organization's operations with the fatigue risk management procedures set forth in the FRMP Manual
- Serve as the final authority for fatigue-related risk management decisions, where not delegated to a lower level of management

- Uphold a non-punitive reporting culture
- Review and approve FRMP updates and policy revisions as they are made from time to time in keeping with a commitment to continuous improvement.

☐ Safety Manager

- Develop, implement, and maintain the organization's FRMP in alignment with the SMS (SMS).
- Assign an FRMP Manager
- Define safety performance objectives and propose them to leadership
- Coordinate the appointment of the members of the FRMP Committee, which may be coincidental with established safety meetings
- Ensure adherence to fatigue risk management policies by all personnel in operational disciplines covered by the FRMP
- Conduct risk assessments of fatigue hazards and coordinate mitigating workflows when results exceed established acceptable risk thresholds
- Perform retrospective analyses of fatigue reports
- Monitor safety performance indicators and initiate corrective actions when target values are not achieved
- Ensure all personnel in operational disciplines covered by the FRMP receive role-appropriate fatigue training
- Ensure critical safety-related information is delivered to stakeholders in accordance with the communications plan
- Support investigations and risk assessments involving fatigue-related factors
- Spearhead continuous improvement initiatives across all operational domains within the scope of the FRMP
- Delegate responsibilities to another member of the Safety Committee when not available

The Safety Manager must make sure that the person appointed as the FRMP Manager clearly understands all SMS requirements, processes, and procedures. Selecting someone who is knowledgeable and competent in the SMS will significantly improve the effective implementation, oversight, and ongoing management of the FRMP.

☐ FRMP Manager

- Manage the operation of the FRMP in coordination with the Safety Manager and operational discipline representatives
- Provide oversight of fatigue risk management policies (Subpart C) across operational disciplines within the scope of the FRMP
- Support the implementation of software tools (section G.4) to collect fatigue and alertness performance data, identify fatigue hazards, issue notifications, suggest risk controls, deliver training, and perform other functions of the FRMP
- Chair the FRMP implementation committee (sections B.1, G.1), which may be a part of periodic safety meetings
- Advise on investigations of fatigue-related events and incidents
- Coordinate FRMP audits and reports
- Maintain the FRMP Manual
- Meet periodically with discipline representatives to align FRMP processes and share best practices as operational requirements may change

☐ Monitor publications from the FAA, ICAO, USHST, Academica, and accreditation organizations and propose updates to the FRMP, as required

Document appointment of the FRMP Manager in a memorandum if the role is additional to the individual's written primary job responsibilities.

☐ Workers in Operational Disciplines

- Be familiar with and adhere to regulatory requirements and fatigue risk management policies as set forth in the FRMP Manual
- Complete initial and recurring fatigue risk training
- Manage off-duty time appropriately to ensure adequate restorative sleep and rest
- Report for duty sufficiently rested to perform work responsibilities safely and reliably
- Monitor for signs of fatigue in oneself and in fellow workers and communicate any concerns promptly to a supervisor
- Communicate fatigue-related operational risks to the Safety Manager
- Report fatigue incidents in accordance with the process set forth in the FRMP Manual, and in line with established SMS processes
- Develop personal countermeasures to mitigate fatigue and apply them in conjunction with risk controls implemented by the organization under the FRMP
- Follow fatigue assessment procedures and cooperate with other data collection initiatives that are put in place by the organization to measure and manage fatigue risk

☐ Consider using the individual fatigue risk monitoring capabilities (e.g., specialized software applications) and devices (e.g., watch or ring wearables) implemented by the organization to support a shared responsibility for fatigue risk management

Implementation

☐ Publish the finalized list of responsibilities for each organizational role and operational discipline to the policy section of the FRMP Manual.

☐ Distribute role and responsibility guidance to all personnel that perform safety-sensitive activities in the operation, especially those in operational disciplines (i.e., pilots, flight crew, aviation maintenance technicians, and communications specialists). Such guidance includes:

- Fatigue risk management training curriculum

- Job aids such as process flowchart posters and risk control implementation checklists
- If applicable, user guides for specialized software applications used to collect fatigue and alertness performance data and deliver notifications of risk mitigating workflows
- Fatigue reporting resources (e.g., forms, templates, user guidance, SOP)

Provide documentation citing the appointment of the FRMP Manager with a list of their responsibilities. For each manager role and operational discipline, provide documentation of their responsibilities that explicitly includes the responsibilities assigned under the FRMP. Be prepared to demonstrate accomplishment of cited responsibilities.

B.3 Safety Performance Objectives and Safety Performance Indicators

Question

☐ Does the organization have defined safety performance objectives and indicators focused on fatigue risk and mitigation strategies?

Development

☐ Define a set of safety performance objectives for the operation using the SMART (Specific, Measurable, Achievable, Relevant, Time-bound) framework, or an alternative tool. Align with safety performance objectives and indicators already in place under the SMS.

☐ Identify one or more safety performance indicators (SPIs) that will be used to evaluate the operation's success in meeting each safety performance objective. Examples of SPIs and their target values (here expressed as a maximum) include:

- *Percentage of as-flown transports in a calendar month with a peak schedule-based fatigue level above the elevated risk threshold*
- *Percentage of failed Readiness Checks per month (section D.3)*
- *Number of night shift, or post-night duty, maintenance errors and quality escapes per month compared to historical data*

Implementation

- ☐ Document the SPOs and associated SPIs as an annex to the FRMP Manual.
- ☐ Communicate the SPOs and SPIs to all stakeholders in the organization to ensure awareness of performance targets and a comprehensive understanding of the overall fatigue risk management strategy. Follow the guidance for the Other Information category in the communication plan (section E.2).
- ☐ Evaluate the impact and relevance of established SPOs on a periodic basis (i.e., annually), as part of the system performance evaluation process (section F.2). Consider changes that may have occurred in any of the following:
  - Regulatory guidance
  - The size, scope and complexity of the operation
  - Requirements of the SMS
  - Requirements of the QMS
  - Leadership's stated strategies and safety priorities
  - Training curriculum
  - Findings related to audits or safety investigations

Provide documentation of the organization's safety objectives and how their achievement is measured. Provide periodic reports on safety performance indicators and documentation of any corrective actions taken relative to adversely trending results.

Subpart C – Policies

C.1 Accountability and Authority

Questions	☐ Who is responsible for enforcing fatigue risk management policies? ☐ How is the performance of and accountability for fatigue risk management procedures divided among personnel roles at the organization?
Development	☐ Create an organizational chart to illustrate how the management of safe operations at the organization is structured. In this chart, individual manager roles should be shown separately while operational disciplines are represented as a group. Include only personnel who have a role to play in ensuring safety (the complete organizational chart inclusive of all personnel roles is in the Operations Manual). Align with the organizational chart in the SMS. ☐ Name the specific individual fulfilling each manager role, including the Accountable Executive, Safety Manager, and FRMP Manager. If any individual holds multiple roles, ensure each of those roles is listed. ☐ Create a responsibility matrix detailing the ownership, accountability, or involvement of each role as outlined in Section B.2. As an example, a matrix is structured as follows: • **Columns**: individual manager roles and operational disciplines represented in the organizational chart created above • **Rows**: specific procedures detailed in the FRMP (Subpart D) • **Cells**: a letter designating the type of involvement each role has (e.g., R – Responsible, A – Accountable, C – Consulted, I – Informed)
Implementation	☐ Publish the organizational chart and responsibility matrix to the Policies section of the FRMP Manual. ☐ Delegate authority to the FRMP Manager to enforce policies across operational domains within the scope of the FRMP, in coordination with

peer-managers and applicable departments (e.g., Flight Operations, HR, etc.).

Provide documentation supporting implementation and sustainment of FRMP accountability and authority assignments.

Add FRMP role and responsibilities to applicable individual's job descriptions.

C.2 Rules Configuration

Question	☐ How can the degree of fatigue risk be classified into different brackets based on operational measures?
Notes	☐ Any operational measure that is associated with fatigue risk can form the basis of a rule. A rule takes operational data inputs and yields a quantitative output value.[1] The range of possible output values for a rule can be divided into brackets representing different levels of fatigue risk (i.e., nominal, moderate, elevated, and high). ☐ Fatigue risk management software tools use rules to automatically issue notifications when output values fall into higher risk brackets. Such notifications serve as the trigger for mitigating workflows. ☐ Changes to Flight Operations Manuals (FOM) or software integrations with existing flight operations software may require changes in the FAA-approved Aviation Operations Specifications (OpsSpecs).

[1] The term "rule" as it is used here carries a different meaning than "prescriptive regulation." Air operators are regulated by prescriptive rules, such as a limit on the number of flying hours per day for flight crew members.

	☐ Rules can be applied manually using analogue tools such as SOPs, risk matrices, or predetermined triggers when analytics software is unavailable.
Development	☐ Create a set of rules to support predictive (section D.2) and proactive (section D.3) fatigue hazard identification procedures. Rules are commonly linked to specific operational measures. Examples of operational measures that can form the basis of rules include: • Number of hours worked per week • Number of hours off duty between successive shifts or workdays • Staffing levels for communications centers and dispatch • Off-shift duty requirements (i.e., servicing an Aircraft on Ground (AOG) event) • Schedule-based Fatigue Level (estimated by a biomathematical model)
	☐ Create a Rules Matrix setting out the details of the rules to be adopted in the FRMP. Recommend a Rules Matrix spreadsheet that has the following structure: • **Columns**: The operational domains covered by the FRMP; the frequency with which the output value is calculated (i.e., hourly, daily, etc.) • **Rows**: Descriptive names of the rules selected for the FRMP
	☐ For each rule in the Rules Matrix, create a Rule Configuration Table that sets out the following information: • Specific lower bounds (thresholds) for the moderate, elevated, and high risk brackets • Notification pathways (i.e., specific personnel roles to be notified in the event of a threshold exceedance) • Risk controls available to mitigate a high risk state within each operational domain

Implementation	☐ Establish a planned activation date for each rule selected for the FRMP. Include this information in the FRMP Implementation Plan (section G.1) and communicate to the operational disciplines. ☐ Publish the Rules Matrix and Rules Configuration Tables as appendices to the FRMP Manual and notify the operational disciplines via standardized communication modes and methods. ☐ Align with existing SMS operational measures and processes for established rules (e.g., risk limits) as described here.

Provide documentation citing activation of rules, with the associated rules matrix and configuration tables. Be prepared to demonstrate the application of each rule in the FRMP.

C.3 Operational Policies

Questions	☐ Are there any unique characteristics of the operation or specific directives from leadership not already captured by the accountability and authority policies and rules configuration? ☐ Is there potential for workers in the operation to hesitate reporting feeling fatigued for fear of negative repercussions?
Development	☐ Review the outcome of the gap analysis performed as part of the first phase of FRMP implementation (section G.1). Identify business workflows susceptible to fatigue risk where existing policies, procedures, or rules developed for the FRMP do not provide sufficient coverage as preventive measures. To help make this determination, consult with representatives from applicable operational disciplines. Consider consulting experts in implementing FRMPs for similar organizations. ☐ Consider areas of potential fatigue risk that are outside the direct scope of the operation (e.g., personal off-duty demands, 2nd jobs, commutes). ☐ Create supplemental operational policies to address fatigue risk exposures identified in the discovery process described above.

	☐ Provide written guidance on the alertness assessment of workers and fatigue reporting. This policy should set out that it is the organization's responsibility to periodically verify worker alertness for duty as part of a commitment to safe operations. Align any supplemental operational policies with the SMS and QMS; especially focused on the organization's values and principles of a just culture approach to fatigue reporting. ☐ Assess alternative ways to manage systemic fatigue such as safety risk assessments (SRA), root cause analysis (RCA) within investigations, and Fishbone (a.k.a. Ishikawa) diagrams.
Implementation	☐ Publish the supplemental operational guidelines to the Policies section of the FRMP Manual. ☐ Communicate, in accordance with the communication plan (section E.2), the supplemental operational policies to all individuals in the operational domains within the scope of the FRMP. ☐ If determined relevant, introduce systemic fatigue risk management into additional analysis processes or cause-and-effect tools.

Provide a current copy of all operational policies signed by the Accountable Executive or their designee. Be prepared to demonstrate how the policies have been communicated to personnel.

As a technique to ensure comprehensive input as well as acceptance from the front line, it is best to include the operational discipline representatives in development of these guidelines.

Subpart D – Procedures

D.1 Monitoring Data from Operations

Questions	☐ What data are collected from the operation to enable fatigue hazards to be identified? ☐ How is the data exploited to reduce risk in the operation?
Notes	☐ As with all safety data, only with timely, complete and accurate data can fatigue hazards be identified. Effective and efficient data collection and monitoring practices reduce the likelihood of fatigue hazards remaining unnoticed or undetected. ☐ Discuss all data collection and privacy controls with the organization's Chief Technology Officer (CTO) or designated individual. ☐ Smaller and resource-limited organizations may consider simpler data collection processes when complex technological solutions are not available. Emphasis should be placed on effective data collection utilizing the most efficient methods for size and scope of the operation.
Development	☐ Identify what data will be collected from the operation and how exactly this data will be monitored. It is recommended this table should include the following specific characteristics about the data:

- **Type**. Examples: duty start and end times, flight start and end times, schedule-based fatigue level, alertness check result, other safety performance indicators
- **Source**. Examples: scheduling software application, specialized software for estimating fatigue levels, fatigue reports from workers, software dashboard displaying results from worker alertness assessments
- **Destination**: Where the collected data will be stored
- **Sampling frequency**: How often the data will be collected and saved to the storage destination
- **Monitoring details**: What system or which individual role will review the data and how often the data will be reviewed

☐ Ensure compliance with data privacy requirements (e.g., HIPAA, PII). De-identify personally identifiable information where appropriate. It is recommended to follow guidelines detailed in SMS Part 5, Subpart F, Documentation and Record Keeping,

Implementation

☐ Implement a system that will serve as the access point for the collected data. Perform system integration as required to streamline data collection and ensure data quality. Examples of systems that are commonly integrated are:

- **Human resources**: worker names, roles, start dates, end dates
- **Scheduling**: duty periods, overtime, paid time off
- **Flight tracking**: off-block times, on-block times
- **Specialized fatigue risk management software**: estimates of schedule-based fatigue level, fatigue reporting, notifications, risk control assignment
- SMS
- QMS

☐ Identify the specific individuals and disciplines in the FRMP organizational chart that require access to the data to perform their duties in accordance with the responsibility matrix (section C.1). Enable system access credentials for these individuals in accordance with

established directives and protocols from the Chief Technology Officer (CTO) and Chief Information Officer (CIO), if applicable.

☐ Commence monitoring data for fatigue hazards in accordance with the FRMP implementation plan (section G.1) and in alignment with the SMS and QMS.

Demonstrate data management practices including the collection, analysis, and secure storage of collected operational data. Demonstrate how data flows into parallel systems through purpose-built system integrations.

D.2 Predictive Fatigue Hazard Identification

Question	☐ How can fatigue hazards be predicted when monitoring data from operations and other sources?
Notes	☐ Work schedules can be a source of fatigue when they involve long duty periods, night work, circadian phase misalignment, or insufficient rest opportunity between duty periods. ☐ In a more complex solution, biomathematical modeling based on machine learning and predictive analytics can be used to estimate fatigue hazards associated with the work schedule. If utilized, models shall be validated and calibrated to the specific population (e.g., helicopter crew) and operation, with ongoing monitoring of model accuracy.
Development	☐ Review business process flow diagrams from operational disciplines within the scope of the FRMP and identify processes related to work scheduling. Below are examples: • Planning future duty periods • Making changes to an established duty schedule within 24 hours (due to illness, unforeseen operational conditions, etc.) • Shift trades amongst workers • Call-outs

- Holdovers or extended hours
- Circadian swaps (i.e., changing from predominantly daytime duty periods to predominantly nighttime duty periods, or vice-versa)

☐ For each scheduling-related process identified above and those not listed, select one or more rules from the Rules Matrix (section C.2) that will be applied to the process. To help select the optimal set of rules, consult with representatives from operational disciplines.

Implementation

☐ Activate the selected rules in the applicable scheduling-related business processes in accordance with the FRMP implementation plan (section G.1).

☐ Ensure the individuals directly involved in the scheduling-related business processes receive training in and show proficiency with:

- Which rules have been activated in the process they manage
- What risk controls (section D.5) may be applied in response to elevated fatigue risk states
- How the process will change with such risk controls applied

Demonstrate the practical use of rules and associated notifications.

D.3 Proactive Fatigue Hazard Identification

Question

☐ Does your organization assess individual fatigue states relative to readiness as a proactive measure; whether utilizing technology solutions or traditional analogue methods such as surveys, peer-to-peer check-ins, etc.?

Note

☐ Non-operational factors, also known as individual factors, are an important source of fatigue risk. They include individual biological traits such as susceptibility to fatigue stress, personal sleep need, and chronotype (i.e., morning person vs. evening person). Sleep disorders,

medications, and medical conditions can also contribute to elevated fatigue while on duty. Finally, behavioral factors can create impediments to obtaining enough sleep during off-duty time, resulting in impaired alertness at work.

☐ Rules applied to scheduling-related business processes (see previous section) have no visibility of off-duty activities and cannot capture non-operational factors. For this reason, objective assessments of alertness and self-reported readiness surveys—key forms of proactive fatigue hazard identification—are essential to managing overall fatigue risk.

Consult FAA AC 117-3 for guidelines on fitness for duty standards.

Development

☐ Cross-reference existing fitness for duty (FFD) requirements set forth in the SMS and/or Operations Manual with specific references to the requirement to be reliably alert while reporting for and remaining on duty. Define the alertness standard in terms of objective and subjective measures validated by science. Examples of such measures include:

- Psychomotor Vigilance Test (PVT)
- Karolinska Sleepiness Scale (KSS)
- Samn-Perelli Fatigue Scale (SPS)

☐ If a technical solution is available, create a procedure (Readiness Check) for workers to assess their alertness for duty. If not, utilize available resources to develop a customized readiness check, which may include but is not limited to surveys, co-worker face-to-face check in, crew briefing with acknowledgement of readiness state, etc.

☐ The Readiness Check should be simple to administer and quick to complete; through a software application native for mobile devices (e.g., Apple iPhone® or iPad®, Android® smartphone, etc.). In addition to assaying the fatigue and alertness measures listed above, Readiness Check should include survey questions that collect additional context for the assessment. Examples of survey questions include:

	• Are you sufficiently alert to discharge your duties safely and reliably for the remainder of your duty period? • Did you obtain at least four to six hours of sleep in the last 24 hours? ☐ Align the Readiness Check with existing FFD verification procedures in the SMS. ☐ Establish when Readiness Checks should be performed. Consider three distinct kinds of Readiness Checks: • **Scheduled** Readiness Checks are part of a standard operating procedure (e.g., required at the start of a duty period) • **Rule-Based** Readiness Checks are triggered (assigned as part of a mitigating workflow) when a rule calculation yields an elevated risk state • **Ad Hoc** Readiness Checks are voluntary and may be initiated by a worker at any time ☐ Consult the Rules Configuration Tables (section C.2) for specific details on when rule-based Readiness Checks are required. ☐ Amend operational discipline-specific procedures to include scheduled Readiness Checks. Below are examples of when a scheduled Readiness Check may be appropriate for each of the operational disciplines: • Pilot(s): pre-flight mission planning • Flight Crew Members: prior to commencing duties in support of a flight, when working overtime or extended shift period • Aviation Maintenance Technicians: beginning of a shift, prior to pre-determined complex maintenance tasks • Communication Specialists: during a designated break period, during night duty or when working overtime
Implementation	☐ Create and implement a training program focused on the adopted proactive fatigue risk mitigation tools and tech-based or analogue solutions

☐ Document in the Procedures section of the FRMP Manual:

- the specific fatigue and alertness measures and survey questions selected to comprise a Readiness Check
- timing specifications for when a Readiness Check should be performed by operational disciplines

☐ Develop automated processes for analyzing Readiness Check results data. The outputs from such data analyses can be used as safety performance indicators (section 0) and support FRMP performance evaluation (section F.2).

D.4 Reactive Fatigue Hazard Identification

Question

☐ Are reactive hazard identification processes and protocols established with the SMS?

Development

☐ Develop a set of questions and fatigue and alertness performance measures that will comprise a Fatigue Report relative to an event or incident. Recommend consulting with a subject matter expert in fatigue risk management and data collection. These questions are in compliment to the proactive tools discussed in Section D.3.

☐ Alight with the incident reporting policy in the SMS and/or FOM to include the requirement to submit a Fatigue Reports. Delineate specific circumstances when a Fatigue Report is required, such as:

- After the occurrence of a reportable incident
- After the identification of a fatigue hazard that is assessed at an Elevated risk safety level
- Any time a worker feels their level of fatigue is excessive and incapable of safely conducting operational tasks without elevated risk
- Any time a supervisor or manager determines it is desired in support of complimenting an investigation, risk assessment, root cause initiative, etc.

☐ Create a procedure for analyzing submitted Fatigue Reports. This procedure should include the following elements:

- Identify the specific reason and circumstances associated with the submitted Fatigue Report
- Perform a root cause analysis of the fatigue hazard or safety incident being reported, in accordance with the SMS, considering both individual factors (e.g., poor sleep habits) and operational factors (e.g., high operations tempo)
- Classify the risk level of the fatigue hazard or safety incident being reported using a risk assessment matrix from the SMS, or ICAO (Doc.9859, Ed.4)
- Share findings with the Safety Committee and organization leadership, as required

☐ Determine scope and scale of risk and need for corrective actions or immediate containment actions to limit continued impact of unmitigated risk (e.g., isolated vs systemic hazard, failed process, or behavior).

Implementation

☐ Develop or utilize existing systems and processes that will enable workers to submit Fatigue Reports.

☐ Perform system integration to:

- Enable Fatigue Reports to be appended to incident reports in the SMS
- Capture all available fatigue and alertness performance data associated with a safety incident and save this data SMS in accordance with SMS processes
- Communicate key Fatigue Report data (e.g., dashboard, spreadsheet graphics, email narrative) for safety managers in a reasonable time after the Fatigue Report is submitted

- ☐ Publish the augmented incident reporting policy in an update to the SMSSMS Manual.
- ☐ Publish the Fatigue Report validation and analysis procedure in the FRMP Manual.
- ☐ Train individuals in operational disciplines within the scope of the FRMP on how to access and submit Fatigue Reports.
- ☐ Initiate the Fatigue Reporting capability and Fatigue Report validation and analysis procedure in accordance with the FRMP implementation plan (section G.1).

Demonstrate the process of creating and submitting a fatigue report. Demonstrate how a submitted fatigue report is accessed, validated, and risk assessed.

D.5 Mitigating Risks

Questions

- ☐ Which risks of fatigue should be mitigated?
- ☐ What controls can be used to mitigate fatigue risk?
- ☐ Does your organization define acceptable levels of risk in regard to FRMP?

Notes

- ☐ Due to resource limitations, it is not possible to mitigate all fatigue risks. Each operation should set its own risk tolerance threshold, and
  - Pursue mitigations for fatigue risks assessed above this threshold and continuously monitor, and
  - Accept fatigue risks assessed below this threshold.
- ☐ The notification and workflow details set forth in Rules Configuration Tables (section C.2) are directly tied to the risk tolerance threshold set by the organization.

Development	☐ Establish the organization's risk tolerance threshold. For example, in a four-level safety risk classification scheme (Nominal, Moderate, Elevated, High), it is common to set the threshold at the Moderate risk level, i.e., fatigue hazards assessed at a Moderate risk level or higher require mitigation. Align the chosen threshold with the SMS. ☐ Establish the mitigating workflows corresponding to each safety risk level. Tailor the workflows to each operational discipline covered by the FRMP. Depending on the safety risk level, mitigating workflow examples may include: • Checking in with a supervisor • Taking additional steps to verify the level of risk underlying the fatigue hazard (e.g., completing a Readiness Check) • Implementing one or more risk controls • Follow up with peers and/or supervisor to ensure risk controls were effective in mitigating the fatigue hazard ☐ Identify the available risk controls in the operation. Certain risk controls may be applicable across the operation while others are unique to operational disciplines. Listed below are examples of risk controls tied to operational disciplines in an air operation: • Pilot(s): flight duty restriction (i.e., no flights for a specified time period) • Flight Crew: flight-related workload limits • Aviation Maintenance Technicians: complex maintenance task restriction (i.e., no maintenance of propulsion systems, flight controls, or drive train components) • Communications Specialists: short rest period to allow for an established timed rest period

Implementation	☐ Document available risk controls in the Procedures section of the FRMP Manual. Use the name of each operational discipline as a heading and then list the risk controls that pertain to that discipline. ☐ Align with the SMS ensuring the risks with the highest safety risk rating should be prioritized (mitigated first), followed by risks with lower safety risk ratings. Containment of all newly identified or evolving hazards and associated risks shall always be considered as a part of the mitigation strategy.

Demonstrate the activation of a mitigating workflow following receipt of notification of an elevated risk level triggered by a rule.

Subpart E – Safety Promotion

E.1 Safety Culture

Questions	☐ How does the organization foster a culture of safety, open communication, and professional competence to help guard against fatigue risk? ☐ Is there an established Just Culture within the organization?
Development	☐ Align the FRMP with the foundational principles in the SMS specifically addressing the concept of shared responsibility for safe operations: • It is the organization's responsibility to create duty schedules and break opportunities that enable workers to obtain sufficient rest while off duty • It is each individual worker's responsibility to be aware of their own fatigue level and take charge of their fitness for duty ☐ Ensure the organization promotes a just culture strategy to reporting safety-related issues including fatigue risk. An explicit non-punitive reporting policy (section C.3) is a best practice. ☐ Review the organization's policy on personnel competency requirements (usually found in the Operations Manual). Confirm that competency includes the required skills and training in maintaining fitness and readiness for duty.

A strong communication strategy (see Section E.2) will support the successful introduction, adoption, and long-term sustainability of the program within the organization's workforce. Aligning with existing SMS promotional communications will reinforce the organization's overall safety culture.

Implementation	☐ Complement the policies in the SMSSMS as needed to ensure the concept of shared responsibility for fatigue risk management is included.

☐ Foster greater awareness of fatigue as an occupational hazard by adding the following content to safety training materials:

- Basic science of fatigue
- Basic concepts of fatigue risk management
- Understanding of the organization's FRMP
- Best practices and techniques to mitigate fatigue on and off duty

☐ Amend the organization's personnel competency requirements to include the concept of fitness and alertness for duty.

- Introduce into the organization's occupational health screening process a review of any increasing trend in failed Readiness Checks that cannot be explained by operational factors.

E.2 Communication Plan

Question	☐ How does the organization normally communicate strategy implementation and policy changes?
Notes	☐ A communication plan for a smaller organization may be via email or even bulletin board postings, while those with broader resources may be more technology-based. Regardless, effective and efficient communication is the objective. ☐ The communication plan applies to non-urgent dissemination of information about: • Fatigue risk management policies and procedures • Responsibilities of manager roles and operational disciplines with respect to the operation of the FRMP • Findings from the investigation of reportable incidents where fatigue was found to be a contributing factor • Industry reports, best practices, and relevant scientific developments related to the management of fatigue risk

	• Results from FRMP audits, as well as SPO and SPI periodic results (e.g., monthly, quarterly) ☐ The methods for communicating information of an urgent nature, such as notifications of a high risk fatigue hazard, are addressed in Rules Configuration Tables (section C.2) and risk mitigation procedures (section D.5). These methods should be aligned with the SMS. ☐ Information about topics of a general educational nature may also be communicated as part of the Training Program (section E.3).
Development	☐ Review existing internal communication pathways in the organization to ensure FRMP content will be effectively sent and received by the intended audience ☐ For each communication, specify: • **Manager role** responsible for preparing the content to be communicated and for authorizing its distribution (if applicable) • **Timeframe** for communication (e.g., weekly, quarterly, ad hoc, as soon as possible, etc.) • **Medium** of communication (e.g., email, community portal, employee noticeboard, digital bulletin, etc.) • Whether recipients of the communication will be required to formally **acknowledge receipt** • **Examples** of specific topics that fall into the category, for reference ☐ Align the communication plan with the SMSSMS.
Implementation	☐ Establish the appropriate medium for communication for each information category in the communication plan. ☐ Publish the communication plan in the FRMP Manual. ☐ Monitor the effectiveness of the communication plan and make adjustments as needed.

Provide specific examples of safety promotion through communications of safety-related information to personnel. Demonstrate the process of a recipient acknowledging receipt of a specific communication. Show how the confirmation of receipt is tracked.

E.3 Training Program

Question	☐ Does the organization have an established training manager or program with standards of design, development, instructor selection, and assessments?
Note	☐ The training program discussed in this section is specific to the FRMP. Operators are expected to already have a general safety training program in place; the information below provides guidance on how to complement that training program with topics essential to fatigue risk management.
Development	☐ If a training program does not exist yet, develop a syllabus of learning objectives for the fatigue risk management training program. If it does exist, add specific content to meet minimum requirements. ☐ At a minimum, the syllabus should cover the following topics: • Sources of fatigue risk • Alertness and fitness for duty • Fatigue risk assessment and risk controls • Fatigue reporting processes and tools (if applicable) • Individualized fatigue risk management • Policies, procedures, and rules of the organization's FRMP • FRMP promotion processes, including ongoing education on shared responsibility and the latest scientific developments ☐ Create a learning objectives stratification table to map the learning objectives to manager roles and operational disciplines covered by the FRMP. The table should be structured as follows: • **Columns**: manager roles and operational disciplines

- **Rows**: learning objectives
- **Cells**: a checkmark or filled circle indicating that the particular learning objective is applicable to the particular role/discipline

☐ Develop the training content for each learning objective or license it from a reputable source. An effective format is short, 5- to 7-minute videos with professional narration and visual graphics. Align the training content style and delivery medium with the operation's existing training modes and methods.

☐ Supplement the standard training content with real-world scenarios from the operation.

☐ Create short, multiple-choice quizzes to follow the delivery of each training unit.

☐ Ensure compliance with the requirements of 14 CFR § 5.91 and AC 117-2, as applicable.

Implementation

☐ Publish the fatigue risk management training content and associated quizzes with the learning management system.

☐ Assign initial training to the individuals occupying manager roles and operational disciplines covered by the FRMP.

☐ Track training completion and schedule recurrent training in accordance with the organization's existing training program and SMS.

☐ Include the training curriculum and content in any internal or external audit activities, ensuring an objective assessment.

Provide documentation of the implemented training plan including curriculum, role stratification, records of completed training, and associated quiz scores.

Subpart F – Quality Assurance

F.1 Continuous Improvement

Questions	☐ Does the organization have an existing QMS? ☐ Does the organization have an existing Internal Evaluation Program (IEP)?
Note	☐ In the absence of an established QMS or IEP, the SMS should incorporate a baseline function for both if fully implemented to Part 5 Standards. In this case, FRMP continuous improvement efforts aligned with the SMS should be addressed by all items in the Development and Implementation sections below.
Development	☐ Review the QMS and/or IEP (if applicable) and add references to the FRMP to ensure fatigue risk management is encompassed by the organization's overall commitment to quality assurance. ☐ Identify external sources of information about fatigue risk management standards, regulations, and best practices to keep up to date with new developments. Examples of sources of information include: • Industry conferences and safety stand-down meetings • Advisory Circulars published by the FAA • Guidance issued by the Flight Safety Foundation • Updates to accreditation standards published by industry organizations (e.g., CAMTS) • Accident and incident analyses published by regulatory bodies • Summaries of the latest scientific research findings prepared periodically by firms offering fatigue risk management software and services • Abstracts of fatigue research papers published in scientific journals

	☐ Review safety incident reports from the SMS promptly after they are published. Isolate incidents where fatigue was determined to be a contributing factor and consider what corrective actions and preventive measures may be taken to avoid a recurrence.
Implementation	☐ Connect to sources of information about new developments in fatigue risk management.
	☐ Analyze new developments and carry any relevant findings into the process of making updates or improvements to the FRMP, following the change management process documented in the SMS.
	☐ Establish a pattern of regularly communicating new developments to workers in operational domains within the scope of the FRMP. Follow the guidance for the Other Information category in the communication plan (section E.2). The idea is to keep fatigue "top of mind" by sharing interesting facts and fascinating new research.
	☐ Implement continuous improvement processes such as Plan-Do-Check-Act (PDCA) cycles to refine FRMP procedures.
	☐ Use findings from the analysis of safety incident reports citing fatigue as a contributing factor to adjust discrete elements of the FRMP (i.e., policies, rules, procedures, risk controls, training content, etc.) as a corrective action.
	☐ Implement the corrective actions in accordance with the change management process of the SMS.
	☐ Prepare an amendment to the FRMP Manual reflecting all changes stemming from continuous improvement activities. Follow the document amendment procedure set forth in the SMS to publish the updated FRMP Manual.

Some research firms and safety management vendors specialize in fatigue risk management services and also perform scientific research. Research periodic updates on the latest scientific publications to consider training content or continuous improvement strategies.

Provide documentation supporting the performance of continuous improvement activities. Be prepared to identify specific changes made as a result of continuous improvement initiatives.

F.2 System Performance Evaluation

Question	☐ Does your organization periodically evaluate the performance of existing systems for effectiveness, efficiency, compliance, and evolving risk?
Notes	☐ The effectiveness of the FRMP should be evaluated annually by the FRMP Manager. The purpose of the evaluation is to determine how well the FRMP is achieving the organization's SPOs and to identify areas for improvement. Evaluations shall include a comparison against baseline safety levels (e.g., prescriptive limits) if the FRMP is applied to exceed them. ☐ The key elements of the FRMP that should be subject to the performance evaluation process are: • Stakeholder responsibilities (section B.2) • Safety Performance Indicators (section 0) • Rules (section C.2) • Supplemental operational policies (section C.3) • Mitigating workflows (section D.5) • Communication plan (section E.2)
Development	☐ Identify specific documents and reports that will serve as inputs to the FRMP performance evaluation. These may include: • Reports generated by the fatigue risk management processes • Time series analyses of SPIs • Feedback from personnel engaged in operations covered by the FRMP • Incident analysis reports • Minutes from meetings of the FRMP Committee or Safety Committee, if conducted separately • Information from external sources (section F.1)

	☐ Develop a series of questions that will guide the performance evaluation process. Below are examples of performance evaluation questions: • Do the established operational policies continue to be relevant to current operations? • Are all SPIs within their respective acceptable range? • Are procedures for identifying fatigue hazards adequate? • Are mitigating workflows achieving a reduction in fatigue risk levels?
Implementation	☐ Schedule an annual FRMP performance evaluation. If possible, deconflict from other performance evaluations and choose a seasonal period when the operational tempo is at a minimum, if possible. ☐ Conduct the performance evaluation and prepare a report on results. Present this report at a meeting of the Safety Committee. Provide an executive summary if not attended by the Accountable Executive. ☐ Document specific updates to be made to the FRMP based on the Safety Committee's review of the performance evaluation report. Proceed to implement the updates in accordance with the change management process of the SMS. ☐ Prepare an amendment to the FRMP Manual reflecting all changes that were made. Assign a new version number to the updated FRMP Manual and publish it. ☐ Communicate performance evaluation findings and any notable corrective actions to personnel covered by the FRMP. Follow the guidance for the Other Information category in the communication plan (section E.2).

Provide documentation of a recurring performance evaluation plan. If a performance evaluation has already been completed, provide the performance evaluation report and be prepared to identify any changes or amendments introduced to the FRMP that stem its findings.

F.3 Audits

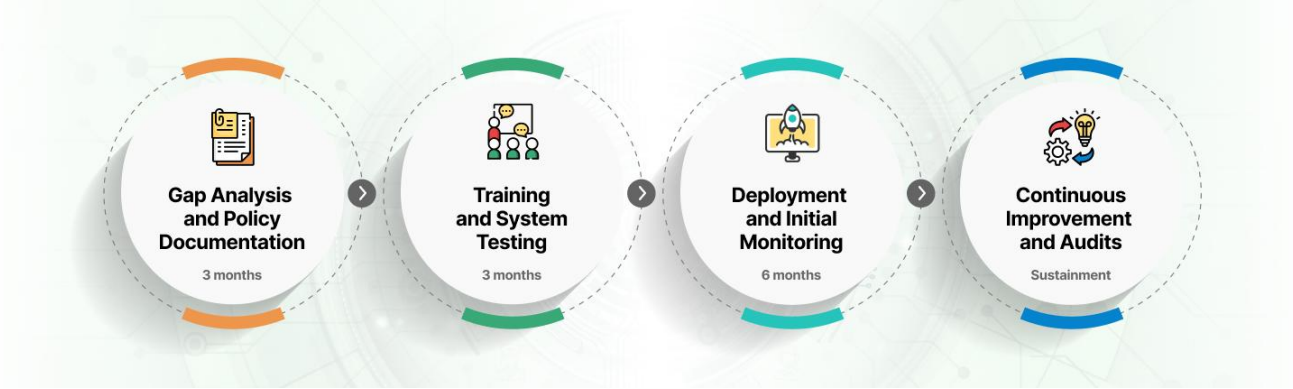
Question	☐ Does your organization conduct periodic internal audits in compliment to required external audits?
Notes	☐ Distinct from a system performance evaluation (section F.2), an FRMP audit is a structured process to determine whether the program is dependable, effective, and meets its compliance objectives, which may include prescriptive regulations or other external and internal standards (section A.3). ☐ FRMP audits may or may not be a regulatory requirement (depending upon industry), however the principles of SMS do require demonstration of hazard management and continuous improvement. ☐ A periodic SMS audit can include an FRMP audit as part of its process, and therefore protocols and processes for the former would be applied.
Development	☐ If an existing audit plan does not exist in the organization, create an audit plan that includes the information below: • **Purpose**: the specific regulation or standard against which compliance is being audited • **Scope:** the topic focus of the audit and the date range of operational data to be examined • **Personnel**: who will conduct the audit • **Schedule**: Start and end date of the audit, as well as an expected delivery date for the audit report ☐ Develop a set of checklists and flowcharts to be used to conduct the audit. ☐ Identify regulator and/or industry best practice determinants (e.g., FAA Data collection Tools (DCT), see Annex 1 - Crosswalk Matrix for multiple resources).

Implementation	☐ Follow QA and/or IEP protocols, if present ☐ Prepare for an upcoming audit by exporting a subset of operational data within the scope of the audit and making it available to the auditor in an appropriate form (i.e., machine-readable, spreadsheet, etc.). ☐ Perform an FRMP audit following the occurrence of any major incident where fatigue was determined to be a contributing factor. ☐ Analyze audit results and determine what corrective actions may be required. ☐ Implement the corrective actions in accordance with the change management process of the SMS. ☐ Present results at the appropriate level of management (e.g., Safety Committee Meeting) and at a minimum provide an executive summary to the Accountable Executive. ☐ Prepare an amendment to the FRMP Manual reflecting any changes necessitated by the corrective actions. Assign a new version number to the updated FRMP Manual and publish it.

Provide documentation of internal audit activities including auditing standards, evaluator selection, and the audit process. If an audit has already been completed, provide the audit report and be prepared to identify any changes or amendments introduced to the FRMP that stem from its findings.

Subpart G – Program Implementation

G.1 Implementation Plan



Question	☐ Does the organization have experience with implementation of strategic plans and programs?
Note	☐ Regardless of scale of the operation, the implementation plan is designed to enable organizations of all sizes small to large to establish a fully functional FRMP in a reasonable amount of time.
Development	☐ Identify what resources will be required for each implementation phase. Consider both human capital and financial investments. Listed below are examples from each category: • **Human capital**: project managers, operational discipline representatives • **Financial investments**: software tools, fatigue risk management training content, consultants with expertise in FRMP implementation ☐ Build a Gantt chart to track progress using specialized project management software or a spreadsheet. ☐ Appoint representatives from operational disciplines covered by the FRMP to an implementation committee chaired by the FRMP Manager.

☐ Develop a phased FRMP implementation plan with specific milestones. The figure above illustrates a four-phased plan with the following subtasks:

☐ Phase 1

- Perform a gap analysis of the current approach to managing fatigue risk in the operation
- Develop an FRMP Manual (section 0)
- Appoint the members of the implementation committee

☐ Phase 2

- Assign designated responsibilities under the FRMP to specific individuals and ensure they receive training in the fatigue risk management policies and procedures applicable to their role
- Procure and implement any software applications selected to support the operation of the FRMP
- Perform system integration and verify data exchanged between systems is free of errors
- Test all procedures, rules, and notifications to ensure they are working as expected
- Deliver a briefing about the FRMP to all personnel that will be covered by it

☐ Phase 3

- Formally activate the FRMP in a subset of the operation
- Monitor adherence to policies and procedures for a period of 1-3 months
- Perform adjustments as necessary and then deploy the FRMP to the rest of the targeted operations

☐ Phase 4

- Verify the FRMP is meeting compliance objectives
- Perform initial and recurring FRMP performance evaluations

- Maintain FRMP documentation and archive FRMP records

Implementation	☐ Convene the first meeting of the implementation committee to kick off the implementation project. Set up a series of recurring meetings to ensure the project is kept on track. ☐ Communicate the implementation plan and required resources to adjacent departments (e.g., Safety, HR) and brief organizational leaders to secure approval and ensure broader awareness. ☐ Provide organizational leaders with periodic briefings on the progression of the FRMP implementation

Provide all historical and current documentation associated with implementation of the FRMP as described in sections G.1 – G.7. Be prepared to demonstrate all applicable procedures and data flows.

G.2 Gap Analysis

Question	☐ Does the organization compare an organization's current state with its desired future state to identify performance gaps and develop actionable plans to bridge them?
Development	☐ Analyze business process flows in each operational discipline within the scope of the FRMP to identify specific safety-sensitive tasks or points in the process where elevated fatigue, if manifested, could contribute to a high risk state. Use a Bowtie or Failure Mode and Effects Analysis (FMEA) framework as a guide. Below are examples of safety-sensitive activities performed in four operational disciplines of an air operation.

	• **Flight Operations:** Duty and flight scheduling, pre-flight checks, aircraft operation, passenger transport, sensitive cargo delivery, search & rescue, etc. • **Crew Operations:** pre-flight checks, auxiliary equipment inspections and operation, CRM roles, documentation • **Aviation Maintenance:** After-hours call-ins, holdovers, field trips (travel across time zones to a temporary work location), high-intensity repairs • **Communications**: Dispatch and coordination operations, equipment operation, managing schedule dynamics ☐ Perform a risk assessment of each fatigue-related risk state identified. Consider the following elements in the risk assessment: • Contributing factors leading to the high risk state • Mitigating factors acting as barriers to the manifestation of the high risk state • Potential consequences of the high risk state if left unchecked • Automated systems acting as barriers to the occurrence of potential consequences of the high risk state ☐ Assign a safety risk level (i.e., nominal, moderate, etc.) to each fatigue-related risk state based on the outcome of the risk assessment, using the risk assessment matrix from the SMS, FAA AC, or from ICAO (Doc.9859, Ed.4) or similar approach. ☐ Note the specific risk states that were assessed at a risk safety classification above the organization's risk tolerance threshold (section D.5).
Implementation	☐ Document the tools, techniques, processes and procedures currently in use to mitigate fatigue risks. ☐ For each safety risk level finding that exceeds the organization's tolerance threshold, determine whether the existing tools, techniques, processes and procedures currently in use are effective as preventative measures.

- [ ] Address any gaps identified in the previous step with appropriate policies, procedures, rules, and controls from the USHST FRMP checklist (this document). Consult also FAA AC 120-103A, ICAO FRMS guidelines, and CAMTS accreditation requirements.
- [ ] Develop an action plan to formally implement the new policies, procedures, rules and controls identified in the previous step. Align this action plan with the FRMP implementation process and SMS change management procedures.
- [ ] Communicate the gap analysis results to applicable stakeholders (e.g., FAA) and organization leadership.

G.3 FRMP Manual

Question	☐ Does the organization have a standard for operations manuals?
Development	☐ Complete development of all elements of the FRMP as outlined in this checklist and align format with existing standard, if applicable. ☐ Document the elements of the FRMP in a comprehensive manual. The manual may be constituted as a standalone document or an appendix to the SMS Manual. Ensure the FRMP Manual includes the following items: • **Administrative details** – signature of the Accountable Executive, control and distribution of the manual, master copy location, amendment process • **Foundational principles** – management commitment, compliance objective, safety performance objectives • **Policies** – role accountability, rules matrix, special operational policies • **Procedures** – monitoring data, fatigue hazard identification, mitigating workflows, risk controls • Training and communication plan • Quality assurance principles
Implementation	☐ Publish the FRMP Manual and obtain the signature of the Accountable Executive to formally adopt it. Ensure the location of the FRMP Manual (section 0) is accessible for all workers within the scope of the FRMP. ☐ Create concise, discipline-specific summaries policies and procedures from the FRMP Manual. These summaries can serve as a quick reference guide for workers in operational domains covered by the FRMP.

☐ Disseminate the policy and procedure summaries in accordance with the communication plan (section E.2). The following modes of communication are appropriate for this purpose:

- Information bulletin
- Workplace posters
- E-newsletter
- Discussion points during planned meetings with personnel (e.g., in-person/virtual town hall, pre-recorded messaging from leadership, etc.)

G.4 Supporting Technology

Question

☐ Is the organization prepared to invest time and resources into a tech-based solution for a fully functional FRMP with timely data collection, analysis, and dashboard-style displays for immediate risk-based decisions and planning?

Notes

☐ The level of fatigue experienced by an individual at any given time is a complex function of many inputs including the duty schedule, biological factors, and behavioral factors. Tracking these inputs and estimating fatigue risk manually is not as effective as technological solutions.

☐ Modern software tools are designed to support real-time data collection and distribute fatigue risk management procedures across multiple disciplines and operating units quickly to enable real-time risk management decisions by management.

Development

☐ Identify the data collection, fatigue hazard identification, and risk assessment procedures in the FRMP that will be automated or otherwise require technology support. Create a list of specifications or requirements. Here are examples of requirements that can be met with software tools:

- Readiness Check data collection

- Predictive estimates of schedule-based fatigue level
- Rule calculations and associated notifications (i.e., real-time alerts)
- Pre-flight risk assessment (e.g., PFRA, FRAT)
- Risk control assignment
- Personal sleep, rest period, and fatigue tracking

☐ If you choose a technology-based solution, pick one or more software vendors that meet these requirements. Consult representatives from operational disciplines to confirm tool selections considering ease of use, fitness for purpose, and other unique circumstances (e.g., flight crew members may need to access software tools on mobile devices while on flight duty).If a technology-focused approach is chosen, wearable devices can deliver personalized evaluations of fatigue risk for each individual.

Using wearables to collect actigraphy data from individual workers carries important privacy and data security considerations. Consult with a domain expert in the intersection of personal data rights with operational data collection objectives.

Implementation

☐ Procure the selected technology tools, working with the organization's finance, legal, and information technology security departments as needed. Ensure the selected vendor(s) offers dedicated technical support both during the implementation stage and during the operation of the FRMP.

☐ In the absence of technology solutions and tools, implement with available resources to meet intent of the FRMP and resulting data-sourced risk management practices to mitigate effects of fatigue.

G.5 Alignment with SMS and QMS

Note

☐ 14 CFR § 5.51 requires that organizations apply a safety risk management process when implementing new systems such as an FRMP. This process is composed of describing the system, identifying the hazards, and analyzing, assessing, and controlling risk.

Development	☐ Integrate the FRMP with the SMS (SMS) per 14 CFR Part 5, ensuring fatigue and alertness performance data feeds into SMS hazard reporting and analysis procedures. Ensure FRMP safety assurance processes (e.g., SPI monitoring, corrective actions) are fully integrated into SMS continuous improvement. ☐ Align FRMP procedures with SMS requirements for hazard identification and risk controls. Ensure the safety risk level classification system (section D.5) is consistent between the FRMP and SMS. ☐ Ensure fatigue risks that require mitigation (section D.5) are integrated into SMS reporting for all operational disciplines. ☐ Align reports generated by the FRMP (section G.7) with the QMS for consistent documentation and streamlined auditing.
Implementation	☐ Create a unified data reporting display such as a dashboard that integrates applicable SMS, QMS, and FRMP data and is accessible by all stakeholders. ☐ Use the human factors analysis and classification (HFACS) framework tool to identify causal categories and the preconditions of fatigue in safety and quality investigations. Include findings of fatigue-related contributing factors in reports and corrective action strategies.

G.6 Implementation Considerations for Safety-Critical Roles

Note	☐ Consider all activities, environmental factors, procedures and processes, and human factors which contribute to fatigue while on duty, as well as FRM mitigation tools, technology, and techniques. Below is an example list of safety-critical roles and proactive mitigation strategies to consider.
Pilot(s)	☐ Software tools should be accessible in flight (e.g., mobile apps). ☐ Notifications should be kept to a minimum to avoid unnecessarily distracting the crew member from the primary task of operating aircraft

	☐ Fatigue risk management software must integrate with flight planning and management systems.
Flight Crew	☐ Data collected under the FRMP must align with SOPs and regulatory protocols (e.g., HIPAA-compliant data handling during air medical care). ☐ Fatigue risk monitoring (i.e., Readiness Checks) should be aligned with predetermined or resulting workflows.
Aviation Maintenance Technicians	☐ Fatigue Reports shall be able to be completed by individual workers while offline (i.e., at remote maintenance sites). ☐ It may be advisable for a Readiness Check to be incorporated into certain pre-task briefings requiring excessive physical activity, cognitive focus, or unique activities (e.g., limited personnel, AOG, overtime).
Communications Specialists	☐ Standardized or automated alerts (e.g., integrated technology) to take breaks or complete a Readiness Check may be useful to help prevent fatigue during long work hours in a sedentary position. ☐ It may be beneficial for fatigue risk notifications and Readiness Check results to be integrated with existing safety, quality, or performance reporting systems.
Safety and FRMP managers	☐ The FRMP must align with the SMS, QMS, human resources protocols, local labor regulations, and operational leadership guidance.

G.7 Documentation and Recordkeeping

Question	☐ Does the organization have established documentation and recordkeeping standards and protocols to adopt within the FRMP?
Note	☐ Documentation of the FRMP is essential as it supports audits and performance evaluations. Good documentation also eliminates

	ambiguity about the “who, what, and how” and thus helps ensure the FRMP operates smoothly and efficiently.
Development	☐ Designate the FRMP Manual (section 0) as the official document governing the operation of the FRMP, with the following controls: • The FRMP Manual has a designated master copy location (typically a tangible paper copy as well as a virtual folder in the organization’s intranet or shared workspace) • Amendments to the FRMP Manual are made in accordance with a formal process set out in the SMS Manual • Each new edition of the FRMP Manual receives a unique version number and publication date • A change log documenting updates to the FRMP Manual is maintained in an appendix • Each edition of the FRMP Manual is approved by the Safety Committee and signed by the Accountable Executive before it is published ☐ Identify the reports and artifacts generated by the operation of the FRMP that are to be archived for recordkeeping purposes. These records commonly include: • SPI reports • Fatigue reports • Rules performance reports • Minutes of meetings of the Safety Committee • System performance evaluation reports • Audit reports • Training records
Implementation	☐ Set up a network folder in the organization’s file server environment for the FRMP Manual and FRMP reports and artifacts.

- ☐ Store records securely, with role-specific access controls and a digital document management system. Work with the organization's Information Technology Security department to ensure adherence to all applicable data confidentiality, integrity, and availability protocols.
- ☐ Verify the records generated by the operation of the FRMP are successfully being saved to the target archival location.
- ☐ Align with existing recordkeeping protocols and the requirements for SMS documentation set forth in 14 CFR §§ 5.95 and 5.97. Also ensure compliance with FAA recordkeeping requirements set forth in 14 CFR §121.495.

Subpart H – Sources

eCFR: 14 CFR 121.495 -- Fatigue risk management system. (FAR 121.495)

eCFR: 14 CFR 117.7 -- Fatigue risk management system. (FAR 117.7)

AC 120-115

AC 117-2 - Fatigue Education and Awareness Training Program

AC 117-3 - Fitness for Duty

AC 120-100 - Basics of Aviation Fatigue

AC 120-103A - Fatigue Risk Management Systems for Aviation Safety

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Utilities, Patrol and Construction (UPAC) Working Group. UPAC Safety Guide for Helicopter Operators. Helicopter Association International. July 10, 2020.

International Association of Oil & Gas Producers (IOGP). Report 690 – Offshore Helicopter Recommended Practices (OHRP). October 2020.

Basic Aviation Risk Standard Foundation (BARS). Implementation Guidelines, Version 10. May 2024.

Basic Aviation Risk Standard Foundation (BARS). OHO Safety Performance Requirements, Version 6. May 2023.

Commission on Accreditation of Medical Transport Standards (CAMTS) -- 12th Ed Accreditation Standards

Managing Fatigue Risks in Aviation Operations | Aviation-SMS

Attachment 11 - Fatigue Risk Management Plan_Redacted-Rel.pdf

InFO10017SUP.pdf FATIGUE RISK MANAGEMENT PLAN (FRMP) CHECKLIST

ICAO: Fatigue Management

ICAO: Fatigue Risk Management Systems (FRMS)

ICAO: Fatigue Management Approaches

Glossary

Acronym	Meaning
AC	Advisory Circular
AOG	Aircraft on Ground
AMOA	Air Medical Operators Association
AVP	Assistant Vice President
BARS	Basic Aviation Risk Standard
CAMTS	Commission on Accreditation of Medical Transport Standards
CFR	Code of Federal Regulations
CIO	Chief Information Officer
CRM	Crew Resource Management
CTO	Chief Technology Officer
DCT	Data Collection Tool(s)
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation(s)
FFD	Fitness for Duty
FMEA	Failure Mode and Effects Analysis
FOM	Flight Operations Manual
FRAT	Flight Risk Assessment Tool
FRMP	Fatigue Risk Management Program
FRMS	Fatigue Risk Management System
HFACS	Human Factors Analysis and Classification System
HIPAA	Health Insurance Portability and Accountability Act
HR	Human Resources
HSE	Helicopter Safety Enhancement
ICAO	International Civil Aviation Organization
IEP	Internal Evaluation Program
IMC	Instrument Meteorological Conditions
IOGP	International Association of Oil & Gas Producers
KSS	Karolinska Sleepiness Scale
OHO	Offshore Helicopter Operations
OHRP	Offshore Helicopter Recommended Practices
OpsSpecs	Operations Specifications
PDCA	Plan-Do-Check-Act
PFRA	Pre-Flight Risk Assessment
PII	Personally Identifiable Information
PVT	Psychomotor Vigilance Test
QA	Quality Assurance
QMS	Quality Management System

Acronym	Meaning
RCA	Root Cause Analysis
RP	Recommended Practice
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
SME	Subject Matter Expert
SMS	Safety Management System
SOP	Standard Operating Procedure
SPO	Safety Performance Objective
SPI	Safety Performance Indicator
SPS	Samn-Perelli Fatigue Scale
SRA	Safety Risk Assessment
SVP	Senior Vice President
UPAC	Utilities, Patrol and Construction
USHST	United States Helicopter Safety Team

Annex 1

Guidance for Use of the FRMP Checklist - Continuous Improvement Crosswalk Matrix

The Continuous Improvement Crosswalk Matrix is a tool intended to assist users in identifying and referencing leading resources from the regulator, Part 135 supporting organizations, and recognized industry subject matter experts. Its purpose is to support the design and development of a Fatigue Risk Management Program that satisfies the Checklist requirements while also enabling enhancements beyond the minimum standard through continuous improvement over time.

This tool provides a comparative reference for all 85 Checklist implementation compliance items across 12 selected resources found in Subpart H - Sources, resulting in more than 1,000 cross-reference opportunities. The referenced materials have been researched and identified as among the most comprehensive and informative resources currently available; however, the list should not be considered all-inclusive, as additional relevant resources do exist.

The Crosswalk Matrix is designed to be practical, customizable, and sustainable as an internal reference document. It may also serve as supporting evidence during audits, program reviews, revisions, or continuous improvement activities.

Step 1

Determine whether there is intent and opportunity to implement FRMP provisions that exceed the minimum Checklist implementation standards or improve previous versions of the program guidance.

Step 2

Research, review, and compare the recommended resources within the Crosswalk Matrix to determine which information, methodologies, content, or techniques should be adopted or incorporated into the organization’s customized FRMP.

Step 3

Incorporate additional information, methodologies, content, or techniques into the organization's customized FRMP. It is recommended to annotate each addition within the customized FRMP by adding to the sequential listing of the appropriate section’s Implementation section.

Step 4

Document the review process and resulting decisions regarding content adoption or incorporation by selecting the applicable boxes associated with each implementation directive and referenced resource (reference Crosswalk Matrix below). The adjacent columns in the matrix allow for detailed input documenting the actions taken. It is recommended that the completed Crosswalk Matrix be retained as an internal reference document or supported by a memorandum summarizing the actions taken and resulting outcomes.

FRMP Checklist Continuous Improvement Crosswalk Matrix						Regulatory and Industry Guidance											
#	Checklist Implementation Compliance - Item Description	Section Number Reference	Inclusion of regulatory and / or industry best practice, guidance, or technique?	If yes, explain in detail below.	Page, Section, and paragraph number from Checklist	CFR Title 14, Ch1, G-121-R § 121.495	CFR Title 14, Ch1, G-117 § 117.5 Fitness for Duty	CFR Title 14, Ch1, G-117 § 117.7	CFR Title 14, Ch1, G-117 § 117.9	FAA Advisory Circular 117-2 AC 117-2 Fatigue Education and Awareness Training Program	FAA Advisory Circular 117-3 AC 117-3 Fitness for Duty	FAA Advisory Circular 120-103A AC 120-103A FRMS for Aviation Safety	CAMTS Standards Transport Checklist 12th Ed.	IOGP Report 690	UPAC Safety Guide (HSI)	BARS Implementation Guidelines Ver. 10, May 2024	BARS OHO Safety Performance Reqts Ver. 6, May 2023
						Place a checkmark in each column below corresponding to the checklist implementation and sustainment compliance requirement, if additional information considered a best practice, or technique, is included from regulatory and industry guidance.											
1	Document the operational domains that will be covered by the FRMP in the statement of management commitment (section B.1).	A.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	Validate definitions of key terms and acronyms with discipline representatives to ensure they are clear and unambiguous.	A.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	Document the list of validated key terms and acronyms into a formal glossary. Ensure this glossary is appended to the FRMP Manual (section G.3).	A.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	Periodically update the glossary to reflect any changes in general requirements (section A.3).	A.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	Create a policy statement that identifies specific requirements that will form the compliance objective for the organization. Publish this statement to the Policies section of the FRMP Manual.	A.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	Conduct periodic compliance and conformance audits to ensure the FRMP continues to meet these requirements. If any alternate mode of compliance is used with respect to one or more specific requirements, create a safety case that encompasses the following elements at a minimum: (see pg 12 for more info)	A.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	Periodically review applicable federal regulations, industry accreditation requirements, and industry standards for changes relevant to the operation. Update the compliance objective policy statement accordingly.	A.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	Confirm with the Safety Manager (or their designee) that they understand and accept responsibility for overseeing the implementation of the FRMP.	B.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	Appoint an individual from each operational domain within the scope of the FRMP to act as a representative of their discipline in the FRMP development and implementation process. This group of individuals, together with the Safety Manager and consulting experts from a professional (see pg 14 for more info)	B.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	Obtain leadership's approval for specific budget items within the current fiscal period that cover the anticipated direct and indirect costs of implementing the FRMP.	B.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11	Estimate the annual cost of operating the FRMP once implementation is complete. Communicate this estimate to the organization's finance department to ensure it is included in future budget planning.	B.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12	Convene quarterly meetings with leadership to: (1) provide a briefing on how the FRMP implementation is progressing, and, once it is active, (2) share audit findings and measures of the effectiveness of the FRMP and (3) evaluate the degree to which the RMP is achieving the organization's strategic objectives.	B.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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13	Publish the finalized list of responsibilities for each manager role and operational discipline to the policy section of the FRMP Manual.	B.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
14	Distribute role and responsibility guidance to all personnel that perform safety-sensitive activities in the operation, especially those in operational disciplines (i.e., flight crew, medical crew, aviation maintenance technicians, and communications specialists). Such guidance includes: (see pg 19 for more info)	B.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15	Document the safety performance objectives and associated SPIs in the FRMP Manual.	B.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16	Communicate the safety performance objectives and SPIs to all stakeholders in the organization to ensure awareness of performance targets and a comprehensive understanding of the overall fatigue risk management strategy. Follow the guidance for the Other Information category in the communication plan (section E.2).	B.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
17	Evaluate the impact and relevance of established safety performance objectives on a periodic basis (i.e., annually), as part of the system performance evaluation process (section F.2). Consider changes that may have occurred in any of the following: (see pg 20 for more info)	B.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
18	Publish the organizational chart and responsibility matrix to the Policies section of the FRMP Manual.	C.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
19	Delegate authority to the FRMP Manager to enforce policies across operational domains within the scope of the FRMP, in coordination with peer-managers and applicable departments (e.g., Flight Operations, HR, etc.).	C.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20	Establish a planned activation date for each rule selected for the FRMP. Include this information in the FRMP Implementation Plan (section G.1).	C.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21	Publish the Rules Matrix and Rules Configuration Tables as appendices to the FRMP Manual.	C.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
22	Publish the supplemental operational policies to the Policies section of the FRMP Manual.	C.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
23	Communicate, in accordance with the communication plan (section E.2), the supplemental operational policies to all individuals in the operational domains within the scope of the FRMP.	C.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
24	Implement the technology systems that will serve as the access point for the collected data. Perform system integration as required to streamline data collection and ensure data quality. Retaining a professional services firm with expertise in fatigue risk management and data collection is recommended. (see pg 27 for more info)	D.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
25	Identify the specific individuals and disciplines in the FRMP organizational chart that require access to the technology systems to discharge their duties under the FRMP in	D.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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	accordance with the responsibility matrix (section C.1). Provision system access credentials for these individuals in accordance with established directives and protocols from the Chief Technology Officer (CTO) and Chief Information Officer (CIO), if applicable.																
26	Commence monitoring data for fatigue hazards in accordance with the FRMP implementation plan (section G.1) and in alignment with the Safety Management System and Quality Management System.	D.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
27	Activate the selected rules in the applicable scheduling-related business processes in accordance with the FRMP implementation plan (section G.1).	D.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
28	Ensure the individuals directly involved in the scheduling-related business processes receive training in: (see pg 29 for more info)	D.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
29	Document in the Procedures section of the FRMP Manual: the specific fatigue and alertness measures and survey questions selected to comprise a Readiness Check, and timing specifications for when a Readiness Check should be performed, by operational discipline.	D.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
30	Develop automated processes for analyzing Readiness Check results data. The outputs from such data analyses can be used as safety performance indicators (section B.3) and support FRMP performance evaluation (section F.2).	D.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
31	Procure the technology systems that will enable workers to submit Fatigue Reports.	D.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
32	Perform system integration to: (see pg 32 for more info)	D.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
33	Publish the augmented incident reporting policy in an update to the Safety Management System Manual.	D.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
34	Publish the Fatigue Report validation and analysis procedure in the FRMP Manual.	D.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
35	Deliver training on how to access and submit Fatigue Reports to individuals in operational disciplines within the scope of the FRMP.	D.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
36	Active the Fatigue Reporting capability and Fatigue Report validation and analysis procedure in accordance with the FRMP implementation plan (section G.1)	D.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
37	Document available risk controls in the Procedures section of the FRMP Manual. Use the name of each operational discipline as a heading and then list the risk controls that pertain to that discipline.	D.5				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
38	Ensure the Procedures section of the FRMP Manual stipulates that the risks with the highest safety risk rating should be prioritized (mitigated first), followed by risks with lower safety risk ratings.	D.5				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

FRMP Checklist Continuous Improvement Crosswalk Matrix						Regulatory and Industry Guidance											
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39	Amend policies in the Safety Management System as needed to ensure the concept of shared responsibility for fatigue risk management is included.	E.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
40	Foster greater awareness of fatigue as an occupational hazard by adding the following content to safety training materials: basic concepts of fatigue risk management, and mention of the organization's FRMP.	E.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
41	Amend the organization's personnel competency requirements to include the concept of fitness and alertness for duty. Introduce into the organization's occupational health screening process a review of any increasing trend in failed Readiness Checks that cannot be explained by operational factors.	E.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
42	Establish the appropriate medium for communication for each information category in the communication plan.	E.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
43	Enable an efficient method of collecting acknowledgements of receipt, if applicable.	E.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
44	Publish the communication plan in the FRMP Manual.	E.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
45	Update the overall communication plan in the Operations Manual (if applicable) to align with the communication plan in the FRMP.	E.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
46	Monitor the effectiveness of the communication plan and make adjustments as needed.	E.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
47	Publish the fatigue risk management training content and associated quizzes to the learning management system.	E.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
48	Assign initial training to the individuals occupying manager roles and operational disciplines covered by the FRMP.	E.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
49	Track training completion and schedule recurrent training in accordance with the organization's existing training program and Safety Management System.	E.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
50	Retain a subject matter expert to review the training content every three years.	E.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
51	Connect to sources of information about new developments in fatigue risk management.	F.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
52	Analyze new developments and carry any relevant findings into the process of making updates or improvements to the FRMP, following the change management process documented in the Safety Management System.	F1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
53	Establish a pattern of regularly communicating new developments to workers in operational domains within the scope of the FRMP. Follow the guidance for the Other Information category in the communication plan (section E.2). The idea is to keep fatigue "top of mind" by sharing interesting facts and fascinating new research.	F.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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54	Implement continuous improvement processes such as Plan-Do-Check-Act (PDCA) cycles to refine FRMP procedures.	F.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
55	Use findings from the analysis of safety incident reports citing fatigue as a contributing factor to adjust discrete elements of the FRMP (i.e., policies, rules, procedures, risk controls, training content, etc.) as a corrective action.	F.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
56	Implement the corrective actions in accordance with the change management process of the Safety Management System.	F.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
57	Prepare an amendment to the FRMP Manual reflecting all changes stemming from continuous improvement activities. Follow the document amendment procedure set forth in the Safety Management System to publish the updated FRMP Manual.	F.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
58	Schedule an annual FRMP performance evaluation. If possible, choose a seasonal period when the operational tempo is at a minimum.	F.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
59	Conduct the performance evaluation and prepare a report on results. Present this report at a meeting of the Safety Committee attended by the Accountable Executive.	F.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
60	Document specific updates to be made to the FRMP based on the Safety Committee's review of the performance evaluation report. Proceed to implement the updates in accordance with the change management process of the Safety Management System.	F.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
61	Prepare an amendment to the FRMP Manual reflecting all changes that were made. Assign a new version number to the updated FRMP Manual and publish it.	F.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
62	Communicate performance evaluation findings and any notable corrective actions to personnel covered by the FRMP. Follow the guidance for the Other Information category in the communication plan (section E.2).	F.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
63	Prepare for an upcoming audit by exporting a subset of operational data within the scope of the audit and making it available to the auditor in an appropriate form (i.e., machine-readable, spreadsheet, etc.).	F.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
64	Perform an FRMP audit following the occurrence of any major incident where fatigue was determined to be a contributing factor.	F.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
65	Convene a meeting of the Safety Committee with the Accountable Executive in attendance to review the audit report once it has been compiled. Analyze audit results and determine what corrective actions may be required.	F.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
66	Implement the corrective actions in accordance with the change management process of the Safety Management System.	F.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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67	Prepare an amendment to the FRMP Manual reflecting any changes necessitated by the corrective actions. Assign a new version number to the updated FRMP Manual and publish it.	F.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
68	Convene the first meeting of the implementation committee to kick off the implementation project. Set up a series of recurring meetings to ensure the project is kept on track.	G.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
69	Communicate the implementation plan and required resources to adjacent departments (e.g., Safety, HR) and brief organizational leaders to secure approval and ensure broader awareness.	G.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
70	Provide organizational leaders with periodic briefings on the progression of the FRMP implementation.	G.1				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
71	Document the tools, techniques, processes and procedures currently in use to mitigate fatigue risks.	G.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
72	For each safety risk level finding that exceeds the organization's tolerance threshold, determine whether the existing tools, techniques, processes and procedures currently in use are effective as preventative measures. To help make this determination, consult with a professional services firm with expertise (see pg 48 for more info)	G.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
73	Address any gaps identified in the previous step with appropriate policies, procedures, rules, and controls from the USHST FRMP checklist (this document). Consult also FAA AC 120-103A, ICAO FRMS guidelines, and CAMTS accreditation requirements.	G.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
74	Develop an action plan to formally implement the new policies, procedures, rules and controls identified in the previous step. Align this action plan with the FRMP implementation process and Safety Management System change management procedures.	G.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
75	Communicate the gap analysis results to applicable stakeholders and organization leadership.	G.2				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
76	Publish the FRMP Manual and obtain the signature of the Accountable Executive to formally adopt it. Ensure the location of the FRMP Manual (section G.3) is accessible for all workers within the scope of the FRMP.	G.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
77	Create concise, discipline-specific summaries policies and procedures from the FRMP Manual. These summaries can serve as a quick reference guide for workers in operational domains covered by the FRMP.	G.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
78	Disseminate the policy and procedure summaries in accordance with the communication plan (section E.2). The following modes of communication are appropriate for this purpose: Information bulletin, Workplace posters, Electronic newsletter.	G.3				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
79	Procure the selected technology tools, working with the organization's finance, legal, and information technology	G.4				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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	security departments as needed. Ensure the selected vendor(s) offers dedicated technical support both during the implementation stage and during the operation of the FRMP.																
80	Create a unified data reporting display such as a dashboard that integrates applicable SMS, QMS, and FRMP data and is accessible by all stakeholders.	G.5				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
81	Use the human factors analysis and classification (HFACS) framework tool to identify causal categories and the preconditions of fatigue in safety and quality investigations. Include findings of fatigue-related contributing factors in reports and corrective action strategies.	G.5				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
82	Set up a network folder in the organization's file server environment for the FRMP Manual and FRMP reports and artifacts.	G.7				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
83	Store records securely, with role-specific access controls and a digital document management system. Work with the organization's Information Technology Security department to ensure adherence to all applicable data confidentiality, integrity, and availability protocols.	G.7				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
84	Verify the records generated by the operation of the FRMP are successfully being saved to the target archival location.	G.7				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
85	Align with existing recordkeeping protocols and the requirements for Safety Management System documentation set forth in 14 CFR §§ 5.95 and 5.97. Also ensure compliance with FAA recordkeeping requirements set forth in 14 CFR §121.495.	G.7				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐