

COS-3-10

GUIDANCE FOR DEVELOPING A FATIGUE RISK MANAGEMENT PROGRAM

FIRST EDITION | MAR 2024



**SEMS AUDIT &
CERTIFICATIONS**



**GOOD PRACTICE
DEVELOPMENT**



**DATA COLLECTION,
ANALYSIS & REPORTING**



**SHARING INDUSTRY
KNOWLEDGE**

SPECIAL NOTES

This document is an interim, voluntary guide that is intended to identify issues for possible consideration. It is not intended as a recommended practice or industry standard, as an API standard is currently being developed pursuant to the consensus process found in API's Procedures for Standards Development. Recommendations found in the document reflect a mix of good practices found in other sources and "should" statements within should not describe or establish duties of care, but are meant to be informational in nature. Users of the document are strongly encouraged to conduct their own, independent analysis of the applicability of the practices found in the document to their operations.

Center for Offshore Safety (COS) and American Petroleum Institute (API) publications necessarily address topics of a general nature. Local, state, and federal laws and regulations should be reviewed to address particular circumstances.

COS, API, and their respective employees, members, subcontractors, consultants, committees, or other assignees make no warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. COS, API, and their respective employees, members, subcontractors, consultants, or other assignees do not represent that use of this publication would not infringe upon privately owned rights.

COS publications may be used by anyone desiring to do so. Every effort has been made to assure the accuracy and reliability of the data contained in them; however, the COS and API make no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaim any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

COS publications are published to facilitate the broad availability of offshore safety information and good practices. These publications are not intended to obviate the need for applying sound judgment regarding when and where these publications should be utilized. The formulation and publication of COS publications is not intended in any way to inhibit anyone from using any other practices. Questions or requests for clarification regarding this document may be directed to the Center for Offshore Safety/API, 15377 Memorial Drive, Suite 250, Houston, TX 77079 and Global Industry Services Department, American Petroleum Institute, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001.

Questions concerning the interpretation of the content of API RP 75 or comments and questions concerning the procedures under which API Recommended Practice 75 was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001.

Requests for permission to use in other published works or translate all or any part of the material published herein should be addressed to Global Industry Services Department, American Petroleum Institute, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001.

TABLE OF CONTENTS

1. INTRODUCTION	1
2. DEFINITIONS	1
3. GUIDANCE	2
4. ELEMENT: EDUCATION & KNOWLEDGE	2
5. ELEMENT: ENVIRONMENTAL CONSIDERATIONS	3
6. ELEMENT: FATIGUE RISK MANAGEMENT PROGRAM AND FATIGUE REPORTING	4
7. ELEMENT: DATA COLLECTION FOR AND PERFORMANCE MEASUREMENT OF THE FATIGUE RISK MANAGEMENT PROGRAM	5
8. ELEMENT: PROGRAM SUSTAINABILITY	6
9. ELEMENT: HEALTH AND WELLNESS PROGRAMS	7
10. ELEMENT: TRAVEL	8
11. ELEMENT: DUTY HOURS	9
12.ELEMENT: SLEEP STRATEGIES/HYGIENE	10

1. INTRODUCTION

The Center for Offshore Safety (COS) and its members (oil and gas Operators and Contractors) have been working to educate industry on prevention and management of fatigue risks in the offshore industry. As in any 24/7 industry or operations, workers are regularly exposed to risk factors that may cause or exacerbate fatigue. Fatigue is a health and safety concern. To reduce the likelihood of fatigue-related accidents, organizational management and risk mitigation is essential.

Management of fatigue is a shared responsibility between employers and workers, requiring actions by both parties to facilitate fatigue reduction and management. Work structure (shift lengths, day lengths, rotations, and travel logistics) affects how the workers interact within the organization, and personal health and behaviors influence how personnel manage their fatigue. Taking a proactive approach to fatigue prevention and management will reduce the risk of fatigue-related accidents. This guidance document is provided to help companies develop a Fatigue Risk Management Program by taking a comprehensive, customized approach to addressing fatigue within a company, including policies and practices that address a wide range of fatigue risk factors and mitigation measures. This program should be developed in coordination with existing Health and Safety, Human Resources, and Operations management systems as applicable.

This guide is tailored to the unique operational and environmental challenges of offshore operations. However, the guide is not intended to be a “one-size-fits-all” approach.

Before implementing any element of this guide, companies should conduct an assessment to evaluate their specific operating environment(s) for fatigue-related risks and identify policies and procedures that are already in place to mitigate these risks. Following the risk assessment, the guide can help companies link their existing fatigue mitigation measures into a comprehensive Fatigue Risk Management Program. Some of the guide’s suggested practices may overlap with a company’s existing policies and procedures. Other suggested practices may be implemented to close a gap that a company has discovered or can be considered by a company seeking to expand its fatigue prevention efforts. Some measures discussed in the guide may not apply to a particular company’s operations. The COS Fatigue Risk Management Work Group intends the guide to be a toolbox for use by offshore operators to address their specific fatigue challenges.

Some of the primary sources consulted in the development of this guidance include relevant materials on fatigue from American Waterways Operators (AWO), National Institute for Occupational Safety and Health (NIOSH), and Centers for Disease Control and Prevention (CDC).

2. DEFINITIONS

- **Rotation** - A schedule of work and rest periods (e.g., 14-day rotation of seven night shifts and seven day shifts, followed by 14 days of rest).
- **Shift** - The scheduled hours of work in a 24-hour period (e.g., 12 hours from 06:00 to 18:00).
- **Travel** - The time spent going from one point to another for the purposes of work.
- **Journey Management** - A planned and systematic process of reducing transportation-related risks.
- **Hours of Work** - Hours engaged in activities at the direction of the company or for company benefit.

- **On-call time** - The time during a worker's scheduled period of rest on board or at a site that may be disturbed by work activities at the direction of the company or for company benefit. This is intended to cover situations such as when an employee, having to set the alarms in an unattended machinery space, retires to their bunk but has their rest disturbed by a callout to work. In such circumstances, the employee may need to make up for the rest time lost because they were called out to work.
- **Fatigue** - The state of feeling very tired, weary, or sleepy resulting from insufficient sleep, prolonged mental or physical work, or extended periods of stress or anxiety.
- **Short-change shifts** - A shorter shift and rest period used to switch from days to nights, or vice versa.

3. GUIDANCE

The Fatigue Risk Management Group has identified elements that it considers most important to address in a Fatigue Risk Management Program. Experts agree that these elements positively impact the management of fatigue risks and improve industry safety. A company looking to develop or enhance its fatigue mitigation program may consider focusing on these first four elements initially. Collectively, the elements comprise a toolkit that may be leveraged to tailor a plan specific to the needs of a company.

4. ELEMENT: EDUCATION AND KNOWLEDGE

To manage fatigue effectively, employer fatigue management education and knowledge programs should consider:

- educating workers and supervisors on fatigue and fatigue indicators;
- providing an opportunity for personnel to ask questions to ensure their understanding of fatigue and fatigue indicators; and
- maintaining records of worker training on fatigue and fatigue indicators.

Additional considerations:

- Where possible, training should be provided for all shift workers during their normal work period.
- Refresher training should be taken at defined intervals.

The following is a suggested framework for a fatigue management education and knowledge program:

- Fatigue management introduction
- Causes of fatigue
- Impacts of fatigue
- Managing of fatigue generally
- Roles and responsibilities
- Recognizing the signs of fatigue
- Importance of reporting fatigue
- Managing fatigue at work

5. ELEMENT: ENVIRONMENTAL CONSIDERATIONS

Many environmental factors can impact fatigue, including cabin assignments and associated disruptions, lighting, temperature, air movement, noise, air quality, and assessments of comfort (such as bedding). Each of these environmental factors can impact personnel's ability to fall and stay asleep over the course of their rest period. Addressing these factors in the Fatigue Risk Management Program should include design as well as operation aspects of both sleeping quarters and work environment. Day sleepers need to be considered as well as those sleeping at more traditional hours.

Facility design should consider the following:

- **Lighting** — Provide dark spaces for sleeping with little traffic through these areas to prevent light infiltration. Consider blackout shades and drapes, as well as drapes around individual beds, for managing light in the larger room. Also, consider the use of bright light to stimulate alertness and lower light levels prior to sleep in common spaces.
- **Temperature** — In general, people sleep more efficiently when they are cooler. Consider providing cool spaces for sleeping with access to temperature controls and fans in sleeping quarters. Optional bedding, including both light and heavy blankets, also helps people to be comfortable when sleeping.
- **Noise** — Consider noise reduction techniques (i.e., soundproofing) as a primary means of keeping spaces quiet. Also, consider the location of exterior noise sources like announcement systems and horns in relation to cabins, keeping in mind the need for sleepers to hear emergency alarms. Consider where cabins are in relation to the flow of people over the course of a day and locate day sleepers in places with less traffic. Consider how you will arrange personnel in cabins, either all on the same shift or opposite shifts; both options have pros and cons. A final consideration might be the use of white or pink noise for masking sounds and voices in the cabin areas.
- **Air movement and quality** — Air circulation is important; air that does not circulate can make a room “stuffy” and uncomfortable. Consider the rate of circulation in a space per hour and its impact on air quality (including the removal of odors and contaminants). Ensure that odors are managed by segregating air from bathrooms, smoking rooms, laundries, galleys, kitchens, and exercise spaces from bedrooms. Also, ensure that air quality is managed through proper housekeeping that manages mold, dust, and other contaminants brought into sleeping spaces from the workplace. Care should be taken to locate fresh air intakes away from engine, smoking, laundry, and kitchen exhaust points.
- **Bedding** — Bedding can impact sleep quality and quantity. Mattresses, sheets, pillows, and blankets should be of sufficient quality so that they are not sources of discomfort for personnel.
- **Cabin assignments** — When possible, manage traffic going in and out of the sleeping quarters to isolate it to individuals on the same schedule. Consider who sleeps in the same spaces and if coordinating their shifts makes sense for your organization, preventing disturbances from outside sounds and interruptions.

Some of the most significant impacts to sleep quality and quantity can come from the behaviors of personnel on board. Behavioral norms might include quiet hours during each sleeping period and courteous practices throughout the day. The use of alternative routes away from sleeping quarters outside of shift change hours is one example of courteous practice. Other courteous practices might include limiting hours in gyms, television hours in common rooms, and large meetings in common areas when these are next to, above, or below sleeping quarters. Visitors should be made aware of these practices upon arrival at the facility.

Regular assessments of the quality of bedrooms and the sleeping environments should be considered. Surveys or opportunities for suggestions may be helpful, as may comparison to criteria developed by personnel and/or a class society or hotelier.

6. ELEMENT: FATIGUE RISK MANAGEMENT PROGRAM AND FATIGUE REPORTING

A Fatigue Risk Management Program is the shared responsibility of personnel and the company. Personnel should be well rested and ready for duty when reporting for their rotation and shifts. The company should establish a documented fatigue monitoring and management program, including mitigating potential causes of fatigue where reasonable and practical, and providing effective opportunities to improve an individual's readiness. Team leaders are a critical part of the implementation of a Fatigue Risk Management Program and should be assigned clear roles and responsibilities within the program.

The program should include policies and procedures for personnel to report inadequate rest and/or fatigue and for empowering onshore and offshore management to make work decisions based on this information. When personnel are not rested or show signs of fatigue, mitigation strategies should be agreed upon between personnel and supervisors.

Opportunities for Fatigue Reporting

There are numerous methods of assessing fatigue levels, such as surveys and sleep debt calculations. Companies may conduct pre-rotation fatigue monitoring using some of these methods to identify poor work readiness. Personnel, working with their supervisors, should be trained to use the selected assessment methods appropriately. While on shift, personnel should regularly assess themselves and each other for signs and symptoms of fatigue. Fatigue assessments could be incorporated into pre-shift meetings, safety meetings, etc.

Personnel should be empowered to exercise stop-work authority when they believe fatigue has the potential to jeopardize safety. This would include the ability to self-report their own high level of fatigue and stop work for themselves and others.

Personnel should not be penalized for self-reporting fatigue to a supervisor. The conversation and resulting actions may be documented.

Mitigations for Fatigue and Personnel Management

The following are examples of possible mitigations that can be used when a person has reported fatigue:

- Allow the employee to go off shift and replace the employee with a rested one
- Change the task to one that is less safety-critical
- Provide additional supervision
- Work in pairs
- Encourage the use of Stop Work Authority
- Increase communication with the person
- Judiciously use caffeine
- Make snacks available

7. ELEMENT: DATA COLLECTION FOR AND PERFORMANCE MEASUREMENT OF THE FATIGUE RISK MANAGEMENT PROGRAM

As part of a Fatigue Risk Management Program, companies should set objectives for their Fatigue Risk Management Program and implement a process to regularly monitor and evaluate their practices. This will allow the Company to assess whether and how these practices are being implemented, evaluate whether they are meeting the objectives of the program, and determine whether modifications are needed.

The company should collect data and establish a baseline for evaluating and implementing changes to the program. Data may be collected based on feedback from personnel surveys and self-reports concerning instances where fatigue influenced performance, or other fatigue monitoring tools.

The Company should consider data collected pertaining to incidents and near-misses when evaluating fatigue as a contributing factor. Data such as time of day, environmental factors, hours of continuous work on shift, and individual perceptions of fatigue based on after-action reports and assessments should be considered. Data collected may also be leveraged to identify trends that may indicate increased risk of fatigue and possible approaches to improve fatigue monitoring processes.

Leadership should recognize teams or projects that effectively implement the Fatigue Risk Management Program and achieve other goals, taking into consideration the adherence to the program, regardless of their ability to stay under budget or ahead of schedule.

Personnel should be provided with up-to-date fatigue-related content and KPI progress for safety meetings and briefings on an ongoing basis. The following are examples of fatigue-related KPI:

- amount of overtime or exceptions to hours of work;
- approvals of overtime;
- percent of exception to hours of service requests granted;
- MOC related to fatigue management;
- projects finished on time (instead of early);
- self-reports;
- fatigue-related training completed;
- incidents are reviewed with fatigue in mind as a possible cause;
- number of incidents that identified fatigue as a contributing cause.

8. ELEMENT: PROGRAM SUSTAINABILITY

Integration of fatigue risk management within the management system and safety culture is key to sustainability.

Cultural considerations:

- Encourage open conversations about fatigue among workers and how fatigue can be managed.
- Use self-reporting as an opportunity for collaboration and improving safety. Self-reporting should not be penalized.
- Reinforce the company's commitment to preventing and managing fatigue during management visits to worksites.
- Encourage collaboration between management and personnel on appropriate fatigue mitigation measures.
- Include personnel in the development of the Fatigue Risk Management Program and fatigue mitigation measures.

Ensure the continued relevance of the Fatigue Risk Management Program by considering emerging best practices at regular intervals and updating the program as appropriate.

Evaluate fatigue monitoring tools for effectiveness and consider alternative approaches where opportunities for improvement are identified.

9. HEALTH AND WELLNESS PROGRAMS

Health and wellness programming is an important consideration of a Fatigue Risk Management Program and can be a key way to help employees identify possible latent health conditions and seek appropriate care. Many factors, such as lack of exercise, stress, medical conditions, medications, poor nutrition, poor sleep habits, and sleep disorders can all contribute to problems in obtaining sufficient quality and quantity of sleep.

A Fatigue Risk Management Program should consider the following health and wellness elements:

- Education regarding:
 - o the importance of uninterrupted sleep for physical and mental health;
 - o the importance of maintaining a healthy diet and regular exercise regimen in improving health and sleep;
 - o strategies and resources to manage work-related and personal stress;
 - o healthy sleep habits.
- Resources provided by the company to promote healthy behaviors, including:
 - o nutrition plans and healthy eating options and incentives;
 - o exercise opportunities and access to exercise equipment;
 - o health and wellness coaching;
 - o technological tools for personnel, such as fitness or sleep tracking devices, to incentivize healthy habits and the monitoring of sleep factors.
- Support provided by the company for proactive health management, including:
 - o medical benefits;
 - o initial and periodic comprehensive medical screenings that identify/address health concerns that may be sleep-related (e.g., insomnia, restless leg syndrome, sleep apnea) or could contribute to fatigue;
 - o periodic comprehensive medical screenings for monitoring and control of known health conditions;
 - o access to preventative mental health screenings and treatments;
 - o company-sponsored health fairs, which can be an effective approach to promoting health screenings and education;
 - o utilizing contracted medical providers to conduct medical screenings at work locations.

10. ELEMENT: TRAVEL

Travel involves the time spent going from one point to another (to/from home, heliport, boat dock, between worksites, etc.) for the purposes of work. Travel can impact sleep and be impacted by sleep. Traveling frequently, over long distances, or during normal sleep hours (e.g., between 2300 and 0600) can have a significant impact on fatigue. A Fatigue Risk Management Program should evaluate the travel times and practices of personnel, identify risks, and implement feasible risk mitigation measures. How travel is addressed in the program will vary based on the company's operations. For example, companies whose personnel return home after each shift will have a different approach to travel than companies whose personnel work on rotation.

Travel best practices to consider:

- Implement a Journey Management Policy and documented journey management plans to include total hours of work and travel allowed in a rolling 24-hour period, total hours of travel allowed in a rolling 24-hour period, and total hours of travel allowed between rest breaks.
- Travel time should be planned to provide an appropriate rest period to accommodate healthy sleep hygiene habits, taking into account eating, personal time, bathing/sleep preparation, and sleep (7+ hours)¹.
- Utilize other forms of transportation to get workers home at the end of a rotation, such as:
 - o drivers that have obtained adequate rest;
 - o group vans or carpools.
- Provide accommodations to workers to sleep before or after a hitch.
- Educate personnel and their family members about the risk relationship between travel, sleep duration, and sleep quality.

Work Readiness

Companies should have a Journey Management Program to ensure that employees both arrive on site and back home safely and well rested. The company should promote good journey management. Companies should commit to providing adequate opportunities for individuals to rest between rotations.

¹ <https://www.cdc.gov/niosh/work-hour-training-for-nurses/longhours/mod2/08.html>

11. ELEMENT: DUTY HOURS

During rotation, overtime and emergency situations should be managed within company-defined limits on continuous hours of work and continuous hours of off time. These limits should be visible to leaders to ensure that personnel are given the opportunity for appropriate sleep even during unusual circumstances. Deviations from normal hours of work should be managed within the company's management of change program.

Short-change shifts during a rotation should be avoided when possible. When unavoidable, Companies should consider the types of operations occurring during the short-change shift and try to avoid conducting safety-critical activities.

Meals, activities, and services should be available for all shifts and schedules to allow sufficient time for sleep.

- **Hours of Work**

Hours of work are the time periods when personnel are required to be present and available to perform work tasks.

Personnel may be asked to return to work as a call-out². Personnel whose normal period of rest is disturbed by a call-out should be provided an opportunity for adequate sleep and rest.

- Call-outs that occur (start or end) within the normal rest period should be included as time worked in the closest scheduled shift, and extended limits should apply.

NOTE The time between the call-out and the adjacent shift should be included in the calculation of the hours-of-service limits.

- For call-outs that result in extended shifts, a minimum of the normal rest period (7 to 9 hours) off should be required between the completion of the extended shift and returning to work.
- For situations where an individual is called out to work multiple times throughout the same 24-hour period, the duration of call-outs should be added.

Shifts should be structured to meet the recommended 7 to 9 hours of rest.

- **Hours of Rest**

Employers have a duty of care to provide safe work schedules that permit an adequate amount of time for personnel to sleep, rest, and recover from a shift. Employers should be aware of regulations that may apply to their specific operations³.

It is the responsibility of all personnel to ensure that they are properly rested when they begin duty on site and that they obtain adequate rest when not on duty.

Employers should arrange to conduct emergency drills, such as musters, firefighting, and lifeboat drills, in a way that minimizes the disturbance to rest periods. Compensatory rest should be arranged for personnel whose normal rest is disturbed by these drills.

- **Exceptions for Emergencies**

Situations may arise in which personnel may be required to work during scheduled hours of rest. These include emergencies that threaten the safety of the work site or personnel. In these circumstances, the recommended maximum shift hours may be exceeded. Compensatory rest should be arranged for personnel whose normal rest is disturbed by the emergency, to avoid or recover from fatigue.

²The call-out discussion is based on the recommendations of API RP 755, *Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries*, Second Edition, Section 4.8.3 (2019) but has been changed to reflect the offshore environment and align with the rest of this document.

³For example, *The Merchant Shipping (Hours of Work) Regulations 2011*.

12. ELEMENT: SLEEP STRATEGIES/ HYGIENE

Behaviors during waking hours, especially before rest periods, can have a major impact on sleep. A Fatigue Risk Management Program should educate personnel on best practices for obtaining good sleep, so personnel are rested and alert when starting their rotation/shift. Personnel should aim for 7 to 9 hours of sleep per 24 hours. Both the quantity and quality of sleep obtained during a 24-hour period is important to combat fatigue and improve performance.

Personnel should follow these tips to establish healthy sleep habits⁴:

- Be consistent with sleep schedules. Try waking up and going to sleep at the same time daily, including off rotation, weekends, and vacations.
 - o When consistency is not possible, as during short-change shifts, take advantage of sleep opportunities while adjusting to the new schedule.
- Make all sleeping spaces quiet, dark, and comfortable. Cooler temperatures often aid in better sleep. For louder locations, if allowed by employers, consider earplugs or white noise applications to help reduce perceived noise.
- Limit the use of electronic devices before sleep.
- Avoid using tobacco and drinking caffeine and alcohol before going to sleep.
- Exercise regularly and maintain a healthy diet.
 - o Avoid eating heavy meals before bedtime. If hungry at night, eat a light and healthier snack.

⁴https://www.cdc.gov/sleep/about_sleep/sleep_hygiene.html





