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From: David Diec
To: Carol Gallagher; Evangeline Ngbea
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October 30, 2006 (10:35am)

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ADJUDICATIONS STAFF

Van,

Pls docket the incoming from NEI.

Carol,

Pls post it on the web for FFD rulemaking as soon as it is available in ADAMS.

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>>> "ROE, Jack" <jwr@nei.org> 10/25/2006 12:16 PM >>>
Gentlemen,

Please find attached a draft of NEI 06-11 Managing Fatigue at Power Reactors. It is a work in progress. We will continue to make changes based on industry meetings and public meetings with the NRC.

We will discuss this document at the public meeting on November 9.

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NEI 06-11

Managing Fatigue at Power Reactor Sites

October 2006

ACKNOWLEDGEMENTS

This document, *Managing Fatigue at Power Reactor Sites*, NEI 06-11, was developed by members of the NEI Work Hours Task Force. These industry professionals, experts on access authorization programs, drawing upon practical lessons learned during the application of the previous requirements, provided valuable insights to update the program. The changes provide a more efficient and effective program. NEI also wishes to acknowledge the extensive review and comment by those industry representatives who shaped the final form of this document:

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MANAGING FATIGUE AT POWER REACTOR SITES

1 INTRODUCTION

Reference: 10 CFR Part 26, Subpart I

This guide provides an approach to meeting 10 CFR Part 26, Subpart I requirements related to managing fatigue at power reactor sites. Implementation of the drug and alcohol portion of the fitness for duty program are addressed in NEI 03-01, *Nuclear Power Plant Access Authorization Program* and NEI 03-04, "Guideline for Plant Access Training."

Licensees have a number of programs in place to promote worker alertness and reduce the potential for human performance errors. In 1982 the Regulatory Commission issued Generic Letter 82-12, *Nuclear Power Plant Staff Working Hours*, providing guidelines for managing the hours worked for individuals performing safety related work. The current rule was driven, in part, by the variation in approaches used across the industry to meet these guidelines. To meet the requirements in Subpart I a detailed process for managing and documenting hours worked is required.

The goals of this guide are to provide the tools needed to meet regulatory requirements while:

- Maintaining reasonable assurance of industrial and nuclear safety.
- Recognizing that a wide variety of work situations exist across the industry.
- Supporting management flexibility and decision making when unplanned work is required.
- Avoiding unnecessary administrative burden in documenting hours worked.
- Providing the records needed to allow the required performance evaluations to be performed efficiently.
- Clarifying the rights and responsibilities of licensees and workers.

This guide addresses a number of challenges on the level of detail needed in the program.

This guide addresses the content of training and the comprehensives examination that is required by Part 26 for the following new knowledge and abilities (KAs):

(1) Knowledge of the contributors to worker fatigue, circadian variations in alertness and performance, indications and risk factors for common sleep disorders, shift work strategies for obtaining adequate rest, and the effective use of fatigue countermeasures; and

(2) Ability to identify symptoms of worker fatigue and contributors to decreased alertness in the workplace.

The training for other KAs associated with FFD is addressed in NEI 03-01 and NEI 03-04.

2 PURPOSE AND APPLICABILITY

Reference: 10 CFR Part 26.201

2.1 PURPOSE

The purpose of this guide is to provide the tools needed by licensees to have an effective program for meeting the requirements of 10 CFR Part 26 Subpart I related to managing fatigue. The goal is to provide management processes, record keeping processes and monitoring tools that ensures compliance while providing guidance for flexibility for day to day operations.

2.2 APPLICABILITY

This guide applies to licensees who are authorized to operate a nuclear power reactor (under Sec. 50.57) and holders of a combined license after the Commission has made the finding under Sec. 52.103.

This guide applies to the following individuals, with exceptions noted:

(a) All covered individuals who are granted unescorted access to nuclear power reactor protected areas.

(b) All persons who are granted unescorted access to nuclear power reactor protected areas and who do not perform covered work, except work hour controls.

(c) All persons who are required by a licensee to physically report to the licensee's Technical Support Center or Emergency Operations Facility by licensee emergency plans and procedures, except work hour controls.

(d) Work hour controls only apply to covered individuals.

This guide does not apply to the following individuals because they are not subject to the rule:

(a) Contractor/vendors conducting work off site.

(b) Emergency response personnel who not in the protected area and are not required by a licensee to physically report to the licensee's Technical Support Center or Emergency Operations Facility by licensee emergency plans and procedures.

3 DEFINITIONS

Reference: 10 CFR Part 26.5

The following definitions are used in this guide. Definitions from 10 CFR 26.5 are all in **bold.**

A day off means a calendar day in which an individual does not start a work shift.

Acute fatigue means fatigue from causes (e.g., restricted sleep, sustained wakefulness, task demands) occurring within the past 24 hours.

Alertness means the ability to remain awake and sustain attention.

Break is defined as an interval of time that falls between successive work periods, during which the individual does not perform any duties for the licensee other than one period of shift turnover at either the beginning or end of a shift but not both.

Circadian variation in alertness and performance means the increases and decreases in alertness and cognitive/motor functioning caused by human physiological processes (e.g., body temperature, release of hormones) that vary on an approximately 24-hour cycle.

Contractor/vendor (C/V) means any company, or any individual not employed by a licensee or other entity specified in § 26.3(a) through (c), who is providing work or services to a licensee or other entity covered in § 26.3(a) through (c), either by contract, purchase order, oral agreement, or other arrangement.

Covered individual means an individual subject to work hour controls. Any individual granted unescorted access to a nuclear power plant protected areas who performs duties within the following job duty is a covered individual subject to work hour controls:

- Operating or on-site directing of the operation of systems and components that a risk-informed evaluation process has shown to be significant to public health and safety;
- Performing maintenance or on-site directing of the maintenance of structures, systems, and components (SSCs) that a risk-informed evaluation process has shown to be significant to public health and safety;
- Performing Health Physics or Chemistry duties required as a member of the on-site emergency response organization minimum shift complement;

- Performing the duties of a Fire Brigade member who is responsible for understanding the effects of fire and fire suppressants on safe shutdown capability; and

- Performing security duties as an armed security force officer, alarm station operator, response team leader, or watchperson, hereinafter referred to as security personnel.

Cumulative fatigue means the increase in fatigue over consecutive sleep-wake periods resulting from inadequate rest.

Directing means the exercise of control over a work activity by an individual who is directly involved in the execution of the work activity, and either makes technical decisions for that activity without subsequent technical review, or is ultimately responsible for the correct performance of that work activity.

Eight (8)-hour shift schedule means a schedule that averages not more than 9 hours per workday over the entire shift cycle.

Fatigue means the degradation in an individual's cognitive and motor functioning resulting from inadequate rest.

Increased threat condition means an increase in protective measure level, relative to the lowest protective measure level applicable to the site during the previous 60 days, as promulgated by an NRC advisory.

Onsite means within the protected area of the nuclear power plant.

Nap means a brief period of sleep of at least one half hour.

Protected area has the same meaning as in 10 CFR 73.2(g): an area encompassed by physical barriers and to which access is controlled.

Risk informed evaluation process means an evaluation based on a probabilistic risk analyses approach.

Security personnel means armed security force officer, alarm station operator, response team leader, or watchperson.

Shift cycle means a series of consecutive work shifts and days off that is planned by the licensee to repeat regularly, thereby constituting a continuous shift schedule.

Ten (10)-hour shift schedule means a schedule that averages more than 9 hours, but not more than 11 hours, per workday over the entire shift cycle.

Twelve (12)-hour shift schedule means a schedule that averages more than 11 hours, but not more than 12 hours, per workday over the entire shift cycle.

Work hours means the amount of time an individual performs duties for the licensee. This includes all work hours, with the following exceptions:

- Shift turnover time;
- Within-shift break and rest periods in which there is a reasonable opportunity and accommodation for restorative sleep;
- Unannounced emergency preparedness exercises and drills; and
- Incidental duties performed while off-site provided the total duration of the work does not exceed a nominal 30 minutes during any single break period.

Unit outage means that the reactor unit is disconnected from the electrical grid.

Work hour controls means the regulatory requirements in 10 CFR 26.205.

4 IMPLEMENTATION

The guidance in this document shall be implemented as follows:

1. Normal operations - one year from the publication of the final rule in the *Federal Register*.
2. Refueling outage – the first refueling outage scheduled to start at least one year from the publication of the final rule in the *Federal Register*.

5 POLICY AND PROCEDURES

Reference: 10 CFR Part 26.203 General Provisions

5.1 POLICY

The licensee program shall establish a policy for the management of fatigue for all individuals who are subject to the licensee's FFD program and incorporate the guidance into the site or corporate written FFD policy.

Appendix E provides a model policy.

5.2 PROCEDURES

The licensee program shall develop, implement, and maintain procedures that:

- Describe the process to be followed when any individual covered by the FFD program makes a self-declaration that he or she is not fit to safely and competently perform his or her duties for any part of a working tour as a result of fatigue. The procedure shall:
    - Describe the individual's and licensee's rights and responsibilities related to self-declaration;
    - Describe requirements for establishing controls and conditions under which an individual may be permitted or required to perform work after that individual declares that he or she is not fit due to fatigue;
    - Describe the process to be followed if the individual disagrees with the results of a fatigue assessment that is required under;
    - Describe the process for implementing the controls required for covered individuals;
    - Describe the process to be followed in conducting fatigue assessments; and
    - Describe the sanctions that the licensee may impose on an individual following a fatigue assessment, and the conditions and considerations for taking those sanctions.

Appendix E provides a model procedure.

6 INDIVIDUALS SUBJECT TO WORK HOUR CONTROLS

Reference: 10 CFR Part 26.4

6.1 COVERED INDIVIDUALS

Any individual who performs duties within the following job duty is a covered individual subject to work hour controls:

- Operating or on-site directing of the operation of systems and components that a risk-informed evaluation process has shown to be significant to public health and safety;
- Performing maintenance or on-site directing of the maintenance of structures, systems, and components (SSCs) that a risk-informed evaluation process has shown to be significant to public health and safety;
- Performing Health Physics or Chemistry duties required as a member of the on-site emergency response organization minimum shift complement;
- Performing the duties of a Fire Brigade member who is responsible for understanding the effects of fire and fire suppressants on safe shutdown capability; and
- Performing security duties as an armed security force officer, alarm station operator, response team leader, or watchperson, hereinafter referred to as security personnel.

The licensee program shall clearly define when an individual is subject to work hour controls. The Maintenance Rule, Requirements for monitoring the effectiveness of maintenance at nuclear power plants, § 50.65 (a) (4), ("...the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety."), for structures, systems, and components (SSCs) can be considered a risk-informed evaluation process has shown to be significant to public health and safety. The licensee has the option of using other risk-informed evaluation processes.

6.2 DIRECTING

Directing means the exercise of control over a work activity by an individual who is directly involved in the execution of the work activity, and either makes technical

decisions for that activity without subsequent technical review, or is ultimately responsible for the correct performance of that work activity.

The licensee program shall clearly define when an individual is directing and subject to work hour controls. Considerations should include all of the following:

- Is the individual on-site?
- Is the work in the field?
- Is the individual the first line supervisor/foreman/leader?
- Is the individual actively and directly involved in the execution of the work activity?
- Is the individual making technical decisions for that activity without subsequent technical review?
- Is the individual ultimately responsible for the correct performance of that work activity? (For the purpose of this guide, ultimately refers to first level of leadership accountability for the performance of the task.)

The following personnel are examples of generally considered NOT directing work in the field:

- Engineers not conducting covered work.
- Supervision in the plant of the maintenance on a non-covered SSC.
- Second level supervision
- Work Control Center documentation activities
- Writing a work procedure.
- Preparing a work or modification package.
- Senior Management Review of work plans.
- Training of personnel.
- Vendors and engineers providing advice on test performance, component and system operation, or other similar technical inputs,
- Review and approval of documents.
- Non-licensed STA advice to control room staff.

7 WORK HOUR SCHEDULING

Reference: 10 CFR Part 26.205

This section covers the normal long range schedule used for covered individuals. It does not address the process for scheduled or unscheduled overtime needed to support work activity.

7.1 WORK HOURS SCHEDULING

Licensees shall schedule the work hours of covered individuals consistent with the objective of preventing impairment from fatigue due to the duration, frequency, or sequencing of successive shifts. Licensees should have a policy on establishing schedules.

When establishing non-outage schedules the following should be considered:

- Duration of scheduled work period (not to exceed 12 hours)
- Duration of break period (normally about 12 hours or more)
- Consistent start/stop times for work periods
- Consistent rotation (e.g., if working a 5-week shift rotation, the scheduled work days and days off are repeated every 5 weeks)
- Stable 24 hour shift rotation (e.g., 3 X 8's, 2 X 12's, 2 X 10's with 4 hours unstaffed)
- Rotating schedules provide suitable transition between shifts (days/nights, days/swings/nights) 8-hour shift rotations rotate forward or provide more than (24) hours between work weeks to adjust circadian rhythm; 12-hour shift rotations provide 34 hours off during day/night transitions.
- When assigning individuals to the schedule that meets the above criteria, to assist in fatigue mitigation long range predictability is a key aspect (e.g., every attempt should be made to allow the individual to remain on a stable shift schedule for long periods of time).
- Training requirements.

When establishing an outage schedule the following criteria should be considered:

- Duration of work period
- Duration of break period
- Scheduled work hours are within limits
- Stable 24 hour shift rotation (e.g., 3 X 8's, 2 X 12's, 2 X 10's with 4 hours unmanned)

Staffing levels should be sufficient so that on average, over non-outage periods, for the covered individuals staffing can be maintained based on vacation and emergent training demand without relying on excessive work hours. It is expected and allowed that normal variation in the vacation demand and training demand may occasionally require additional work hours to be used. Management is responsible for understanding the total vacation, training, and work loads, and for maintaining sufficient staff to get the work done.

Appendix B provides a series of shift schedules that meet the criteria of this section.

7.2 NORMAL OPERATIONS DAYS AND OUTAGE DAYS

During a calendar day, the unit can be going into an outage or coming out of an outage. A normal operations day for a shift is a day when the unit is not in an outage when the shift starts. An outage day for a shift is a day when the unit is in an outage when the shift starts.

7.3 DUAL UNIT SITES

A dual unit site may have one unit in an outage and one unit in operation. Different work hour controls apply to a unit in operation and to a unit in an outage. If a covered individual is engaged in both covered work for the unit in operation and covered work for a unit in an outage, the licensee may elect to use either work hour controls for any covered individual.

8 MANAGING HOURS WORKED

Reference: 10 CFR Part 26.205

This section addresses what the expectations are relative to the short term limits and what records are needed to document compliance. Management and covered individuals should be equally responsible for properly managing work hours.

8.1 CALCULATING HOURS WORKED

The concepts for this section are:

- Licensees shall establish the accounting practices to be used in monitoring hours worked. In many cases this will parallel the established system for compensation. Work periods should be rounded consistently.
- Work hour records should show hours worked on a day by day basis, not an hour-by-hour basis. Work period start and stop times should be recorded and documented in a consistent manner.

The licensee shall calculate the work hours of covered individuals subject to this section as the amount of time the individuals perform duties for the licensee. The calculated work hours must include all time performing duties for the licensee, including all within-shift break times and rest periods during which there are no reasonable opportunities or accommodations appropriate for restorative sleep. The licensee may exclude the following as discussed below:

- Shift Turnover
- Within-shift break and rest periods
- Unannounced emergency preparedness exercises and drills
- Incidental duties performed off-site.

Shift turnover.

Licensees may exclude either oncoming or off going shift turnover from the calculation of an individual's work hours. Shift turnover includes only those activities that are necessary to safely transfer information and responsibilities between two or more individuals between shifts. Shift turnover activities may include, but are not limited to, discussions of the status of plant equipment, and the status of ongoing activities, such as extended tests of safety systems and components. Licensees may not exclude work hours worked during turnovers between individuals within a shift period due to rotations or relief within a shift. Activities that licensees may not exclude from work hours calculations also include, but are not limited to, shift holdovers to cover for late arrivals

of incoming shift members; early arrivals of individuals for meetings, training, or pre-shift briefings for special evolutions; and holdovers for interviews needed for event investigations.

Within-shift break and rest periods.

Licensees may exclude from the calculation of an individual's work hours only that portion of a break or rest period during which there is a reasonable opportunity and accommodations for restorative sleep (e.g., a nap).

Unannounced emergency preparedness exercises and drills.

Licensees may exclude from the calculation of an individual's work hours the time the individual works unscheduled work hours for the purpose of participating in the actual conduct of an unannounced emergency preparedness exercise or drill.

Incidental duties performed off-site.

Licensees may exclude from the calculation of an individual's work hours unscheduled work performed off-site (e.g., technical assistance provided by telephone from an individual's home) provided the total duration of the work, which is requested by the licensee, does not exceed a nominal 30 minutes during any single break period. For the purposes of compliance with the minimum break requirements and the minimum day off requirements, such duties do not constitute work periods or work shifts.

Beginning or resuming duties subject to work hour controls.

If an individual begins or resumes performing for the licensee any covered work during the calculation period, the licensee shall include in the calculation of the individual's work hours all work hours worked for the license, including hours worked performing duties that are not covered work and control the individual's work hours in accordance with the requirements of this document.

When considering work hour extensions for individuals performing covered work, all hours worked by the individual shall be included. For example, if an individual has performed 15 hours of work not covered work, and the individual is needed to perform additional work that extends beyond 16 hours in a 24 hour period, then a work hour extension shall be approved prior to the individual exceeding the 16 hour limit.

On the other hand, if the individual has performed 14 hours of covered work, and is needed to perform additional non-covered work, then the programmatic approvals of this document do not apply. However, the additional work hours are included in consideration of any other limits if the individual subsequently performs covered work.

Designated lunches and breaks are included in work hours counted toward limits.

8.2 WORK HOUR CONTROLS

Licensees shall control the work hours of covered individuals as follows:

(1) Except as permitted by waivers and exceptions, licensees shall ensure that any individual's work hours do not exceed the following limits:

(i) 16 work hours in any 24-hour period;

(ii) 26 work hours in any 48-hour period; and

(iii) 72 work hours in any 7-day period.

(2) Licensees shall ensure that individuals have, at a minimum, the rest breaks specified below. A break is defined as an interval of time that falls between successive work periods, during which the individual does not perform any duties for the licensee other than one period of shift turnover at either the beginning or end of a shift but not both. Except as permitted by waivers and exceptions, licensees shall ensure that individuals have, at a minimum,

(i) A 10-hour break between successive work periods, or an 8-hour break between successive work periods when a break of less than 10 hours is necessary to accommodate a crew's scheduled transition between work schedules or shifts (call ins inside of the 10-hour break are considered to be an extension of a work period and the limits in (1) above apply); and

(ii) A 34-hour break in any 9-calendar day period.

(3) Licensees shall ensure that individuals have, at a minimum, the number of days off specified below. For the purposes of breaks, a day off is defined as a calendar day in which an individual does not start a work shift. For the purposes of calculating the average number of days off, the duration of the shift cycle may not exceed 6 weeks.

(i) Individuals who are working 8-hour shift schedules shall have at least 1 day off per week, averaged over the shift cycle;

(ii) Individuals who are working 10-hour shift schedules shall have at least two days-off per week, averaged over the shift cycle;

(iii) Covered individuals, except security personnel, who are working 12-hour shift schedules shall have at least 2.5 days off per week, averaged over the shift cycle; and

(iv) Security personnel who are working 12-hour shift schedules while performing covered work, shall have at least 3 days off per week, averaged over the shift cycle.

(4) During the first 60 days of a unit outage, licensees need not meet the requirements of minimum days off for covered individuals, except security personnel, while those individuals are working on unit outage activities. During the first 60 days of a unit outage, covered individuals, except security personnel, shall have at least 3 days off in each successive (i.e., non-rolling) 15-day period;

(5) During the first 60 days of a unit outage, security system outage, or increased threat condition, licensees shall control the hours worked by security personnel as follows:

(i) During the first 60 days of a unit outage or planned security system outage, licensees need not meet the requirements of minimum days off for security personnel, however security personnel shall have at least 4 days off in each successive (i.e., non-rolling) 15-day period.

(ii) During the first 60 days of an unplanned security system outage or increased threat condition, licensees need not meet any requirements for minimum days off.

(6) The 60-day periods may be extended for each individual in 7-day increments for each non-overlapping 7-day period in which the individual has worked not more than 48 hours during the unit or security system outage or increased threat condition, as applicable; and

(7) When an individual works for a licensee during two or more nuclear unit outages and the interval(s) between successive outages is less than 2 weeks, the requirements in paragraphs (i) through (iii) above must be based upon the number of days that have elapsed since the first unit outage in the series began.

(8) Contractor/vendors are responsible for tracking and reporting their hours between outages.

(9) The daylight saving time change extra hour shall be excluded from work hour calculations.

8.3 WAIVERS

Reference: 10 CFR Part 26.207

This guide provides a recommended, but not mandatory, form for completing Waivers.

The process for granting waivers includes the following distinct steps:

1. Identification by the job supervisor that a waiver is needed:

- Name of the individual for which a waiver is to be requested. If multiple individuals are involved in the work, a separate waiver is required for each individual.
- Date and time request initiated.
- Limits for which a waiver is required.
- Date and time waiver would start.
- Duration of the waiver requested. For example, how many hours beyond 16?
- Description of the work to be performed. This should be in adequate detail to support the supervisory fatigue assessment.
- Circumstances that caused the job extension.

2. Review and approval by the operations shift manager or security shift manager.

- Basis for approval
- Name, signature, date, and time.

3. Supervisory evaluation (Note: shall be completed within 4 hours before start of waiver period.)

- Work history for past 14 days as reported by the individual for whom the waiver is requested.
- Statement of check box that the following were considered:
  - Potential for acute fatigue—time since last 10 hour break.
  - Potential for cumulative fatigue—review work history above.
  - Circadian factors-time of day and recent work cycle.
  - Observation and statements of the individual.
  - Nature of work to be performed.
- Are controls and conditions on work required? If yes describe.
- Name, signature, date, time review completed.

4. Closeout. In many cases waivers are generated as a contingency for a job and not used. The information in this section is to support the periodic reviews that are required.

- Hours actually worked, beyond limits, under this waiver.
- Did the individual perform satisfactorily?
- Name, Signature and date of job supervisor or individual for whom waiver was granted.

8.4 GRANTING WAIVERS

Licensees may grant a waiver of the work hour controls as follows:

In order to grant a waiver, the licensee shall meet both of the following requirements:

An operations shift manager determines that the waiver is necessary to mitigate or prevent a condition adverse to safety, or a security shift manager determines that the waiver is necessary to maintain site security, or a site senior-level manager with requisite signature authority makes either determination; and

A supervisor assesses the individual face to face and determines that there is reasonable assurance that the individual will be able to safely and competently perform his or her duties during the additional work period for which the waiver will be granted. The supervisor performing the assessment shall be trained in accordance with the requirements of §§ 26.29 and 26.203(c) and shall be qualified to direct the work to be performed by the individual. If there is no supervisor on site who is qualified to direct the work, the assessment may be performed by a supervisor who is qualified to provide oversight of the work to be performed by the individual. At a minimum, the assessment must address the potential for acute and cumulative fatigue considering the individual's work history for at least the past 14 days, the potential for circadian degradations in alertness and performance considering the time of day for which the waiver will be granted, the potential for fatigue-related degradations in alertness and performance to affect risk-significant functions, and whether any controls and conditions must be established under which the individual will be permitted to perform work.

To the extent practicable, licensees shall rely upon the granting of waivers only to address circumstances that could not have been reasonably controlled.

Licensees shall ensure that the timing of the required face-to-face supervisory assessment supports a valid assessment of the potential for worker fatigue during the time the individual will be performing work under the waiver. Licensees may not perform the face-to-face assessment more than four hours before the individual begins performing any work under the waiver.

Licensees shall document the bases for individual waivers. The documented basis for a waiver must include a description of the circumstances that necessitate the waiver, a statement of the scope of work and time period for which the waiver is approved, and the bases for the required determinations.

Appendix C provides a sample form for completing waivers.

9 EXCEPTIONS

Reference: 10 CFR Part 26.207

The license may use the following exceptions to work hour controls:

Force-on-force tactical exercises

For the purposes of compliance with the minimum day off requirements, licensees may exclude shifts worked by security personnel during the actual conduct of force-on-force tactical exercises when calculating the individual's number of days off.

Common defense and security

Licensees need not meet the work hour requirements when informed in writing by the NRC that these requirements, or any subset thereof, are waived for security personnel in order to assure the common defense and security, for the duration of the period defined by the NRC.

Plant emergencies

Licensees need not meet the requirements of paragraphs work hour scheduling and work hour controls during declared emergencies, as defined in the licensee's emergency plan.

10 FATIGUE ASSESSMENTS

Reference: 10 CFR Part 26.211

10.1 REQUIRED ASSESSMENTS

(a) Licensees shall ensure that fatigue assessments are conducted for all individuals in the FFD Program under the following conditions:

(1) For-cause. In addition to any other test or determination of fitness that may be required, a fatigue assessment must be conducted in response to an observed condition of impaired individual alertness creating a reasonable suspicion that an individual is not fit to safely and competently perform his or her duties, except if the condition is observed during an individual's break period. If the observed condition is impaired alertness with no other behaviors or physical conditions creating a reasonable suspicion of possible substance abuse, then the licensee need only conduct a fatigue assessment. If the licensee has reason to believe that the observed condition is not due to fatigue, the licensee need not conduct a fatigue assessment;

(2) Self-declaration. A fatigue assessment must be conducted in response to an individual's self-declaration to his or her supervisor that he or she is not fit to safely and competently perform his or her duties for any part of a working tour because of fatigue, except if, following the self-declaration, the licensee permits or requires the individual to take a break of at least 10 hours before the individual returns to duty;

(3) Post-event. A fatigue assessment must be conducted in response to events requiring post-event drug and alcohol testing. Licensees may not delay necessary medical treatment in order to conduct a fatigue assessment; and

(4) Followup. If a fatigue assessment was conducted for cause or in response to a self-declaration, and the licensee returns the individual to duty following a break of less than 10 hours in duration, the licensee shall reassess the individual for fatigue as well as the need to implement controls and conditions before permitting the individual to resume performing any duties. If no break occurs, only one assessment is required.

(b) Either a supervisor or a staff member of the FFD program, who is trained, shall conduct the fatigue assessment face to face with the individual whose alertness may be impaired.

(1) In the case of a fatigue assessment conducted for cause, the individual who observed the condition of impaired alertness may not conduct the fatigue assessment.

(2) In the case of a post-event fatigue assessment, the individual who conducts the fatigue assessment may not have

(i) Performed or directed (on-site) the work activities during which the event occurred;

(ii) Performed, within 24 hours before the event occurred, a fatigue assessment of the individuals who were performing or directing (on-site) the work activities during which the event occurred; and

(iii) Evaluated or approved a waiver of the limits for any of the individuals who were performing or directing (on-site) the work activities during which the event occurred, if the event occurred while such individuals were performing work under that waiver.

(c) A fatigue assessment must provide the information necessary for management decisions and actions in response to the circumstance that initiated the assessment.

(1) At a minimum, the fatigue assessment must address the following factors:

(i) Acute fatigue;

(ii) Cumulative fatigue; and

(iii) Circadian variations in alertness and performance.

(2) Individuals shall provide complete and accurate information that may be required by the licensee to address the required factors. Licensees shall limit any inquiries to obtaining from the subject individual only the personal information that may be necessary to assess the required factors.

(d) The licensee may not conclude that fatigue has not or will not degrade the individual's ability to safely and competently perform his or her duties solely on the basis that the individual's work hours have not exceeded any of the work hour limits or that the individual has had the minimum breaks or minimum days off, as applicable.

(e) Following a fatigue assessment, the licensee shall determine and implement the controls and conditions, if any, that are necessary to permit the individual to resume performing duties for the licensee, including the need for a break.

(f) Licensees shall document the results of any fatigue assessments conducted, the circumstances that necessitated the fatigue assessment, and any controls and conditions that were implemented.

10.2 ASSESSMENT PROCESS

A fatigue assessment is evaluating an individual's ability to perform any assigned duties within the scope of the fitness for duty rule. It is not limited to covered individuals.

The process for conducting a fatigue assessment includes the following steps:

1. Identification condition requiring a fatigue assessment:

- Name of the individual.
- Date and time.
- Type of evaluation: For-Cause, Self-declaration, Past-event, Follow-up
- Narrative supporting the type of evaluation
- For Cause—Description of observed behavior
- Self-declaration—description of current job duties, time in a duty status, and scheduled end of tour.
- Post-event—describe the event and individuals involvement.
- Follow-up—length of rest period, reason for early return, and expected duties
- Name, date, time, signature of individual completing this section.

2.. Supervisory

- Work history for past 14 days as reported by the individual
- Statement of check box that the following were considered;
- Potential for acute fatigue—time since last 10 hour break.
- Potential for cumulative fatigue—review work history above.
- Circadian factors-time of day and recent work cycle.
- Observation and statements of the individual.
- Nature of work to be performed.
- Results of evaluation
    - Individual is not fatigued—return to full work status.
    - Individual is fatigued—provide a 10 hour break.
    - Individual is returned to duties with the following restrictions (Describe)
- Name, date, signature of supervisor.

11 SELF-DECLARATIONS

Reference: 10 CFR Part 26.209

Site procedures should clearly identify how a self-declaration is to be made and leave no room for confusion. A casual statement to a supervisor that an individual is tired is not a self-declaration. The process shall leave no confusion that a declaration was made and when it was made. It should also be clear that an assessment is not needed if the supervisor agrees with the individual and provides a rest break of at least 10 hours.

Any individual covered by the FFD program can self declare.

Self-declarations during extended work hours.

If an individual is performing, or being assessed for, work under a waiver of the requirements and declares that, due to fatigue, he or she is unable to safely and competently perform his or her duties, the licensee shall immediately stop the individual from performing any covered work, except if the individual is required to continue performing those duties under other requirements of the regulations. If the subject individual must continue performing the covered work until relieved, the licensee shall immediately take action to relieve the individual. Following the self-declaration or relief from performing covered work, as applicable, the licensee:

(1) May reassign the individual to duties other than covered work, but only if the results of a fatigue assessment indicate that the individual is fit to safely and competently perform those other duties; and

(2) Shall permit or require the individual to take a break of at least 10 hours before the individual returns to performing any covered work.

12 TRAINING AND EXAMINATION

Reference: 10 CFR Part 26.203(c)

Licensees shall add the following KAs to the content of the training that is required in § 26.29(a) and the comprehensive examination required in § 26.29(b):

(1) Knowledge of the contributors to worker fatigue, circadian variations in alertness and performance, indications and risk factors for common sleep disorders, shiftwork strategies for obtaining adequate rest, and the effective use of fatigue countermeasures; and

(2) Ability to identify symptoms of worker fatigue and contributors to decreased alertness in the workplace.

This section defines the level of training to meet the requirements of 10 CFR 26 Subpart I.

Upon completion of this training, students should be aware of the trustworthiness and reliability requirements for unescorted access to the protected area, the importance of being fit for duty, understand the potential consequences of substance abuse, and work in compliance with the station access authorization and fitness-for-duty policies.

Workers should be able to:

- State the basic fatigue management requirements for covered workers.
- Recognize the personal, public health, and safety hazards associated with fatigue.
- State the company fatigue management policy.
- State individual roles and responsibilities under the company fatigue management policy.
- Demonstrate knowledge of the contributors to worker fatigue, circadian variations in alertness and performance, indications and risk factors for common sleep disorders, shiftwork strategies for obtaining adequate rest, and the effective use of fatigue countermeasures
- Demonstrate understanding of identifying symptoms of worker fatigue and contributors to decreased alertness in the workplace.
- State the methods used to implement the company fatigue management policy.
- State the consequences of not following the company fatigue management policy.
- State individual rights regarding the company fatigue management policy.

An example of a training package is provided in appendix F.

13 REVIEWS

Reference: 10 CFR Part 26.205(e)

Licensees shall evaluate the effectiveness of their control of work hours of individuals who are subject to this section. At a minimum, licensees shall conduct the reviews twice per calendar year. The two reviews need not cover periods of equal duration but must collectively cover the entire calendar year. If any plant or security system outages or increased threat conditions occurred since the licensee completed the most recent review, the licensee shall include in the review an evaluation of the control of work hours during the outages or increased threat conditions. Licensees shall complete the review within 30 days of the end of the review period.

Licensees shall:

(1) Review the actual work hours and performance of covered individuals for consistency with work hours scheduling requirements. Review of performance means compliance with the work hours scheduling requirements and licensee scheduling policy. At a minimum, this review must address:

(i) Individuals whose actual hours worked during the review period exceeded an average of 54 hours per week in any shift cycle while the individuals' work hours are subject to the non-outage days off requirements;

(ii) Individuals who were granted more than one waiver during the review period; and

(iii) Individuals who were assessed for fatigue during the review period;

(2) Review individuals' hours worked and the waivers under which work was performed to evaluate staffing adequacy for all jobs subject to the work hour controls of this section;

(3) Document the methods used to conduct these reviews and the results of the reviews; and

(4) Record, trend, and correct, under the licensee's corrective action program, any problems identified in maintaining control of work hours consistent with the specific requirements and performance objectives of this part.

14 RECORDS

Reference: 10 CFR Part 26.203(d)

Licensees shall retain the following records for at least 3 years or until the completion of all related legal proceedings, whichever is later:

(1) Records of work hours for individuals who are subject to the work hour controls;

(2) Records of shift schedules and shift cycles of individuals who are subject to the work hour controls;

(3) The documentation of waivers including the bases for granting the waivers;

(4) The documentation of work hour reviews; and

(5) The documentation of fatigue assessments.

15 REPORTING

Reference: 10 CFR Part 26.203(e)

Licensees shall include the following information in a standard format in the annual FFD program performance report required under § 26.717:

(1) A summary for each nuclear power plant site of all instances during the previous calendar year in which the licensee waived the work hour controls specified in § 26.205(d)(1) through (d)(4) for individuals described in § 26.4(a). The summary shall include only those waivers under which work was performed. If it was necessary to waive more than one work hour control during any single extended work period, the summary of instances shall include each of the work hour controls that were waived during the period. For each category of individuals specified in § 26.4(a), the licensee shall report:

(i) The number of instances in which each work hour control specified in § 26.205(d)(1)(i) through (d)(1)(iii), (d)(2)(i) and (d)(2)(ii), and (d)(3)(i) through (d)(3)(iv) was waived for individuals not working on outage activities;

(ii) The number of instances in which each work hour control specified in § 26.205(d)(1)(i) through (d)(1)(iii), (d)(2)(i) and (d)(2)(ii), (d)(3)(i) through (d)(3)(iv), and (d)(4)(i) and (d)(4)(ii) was waived for individuals working on outage activities; and

(iii) A summary that shows the distribution of waiver use among the individuals within each category of individuals identified in § 26.4(a) (e.g., a table that shows the number of individuals that received only one waiver during the reporting period, the number of individuals that received a total of two waivers during the reporting period, etc.).

(2) A summary for each nuclear power plant site of instances of fatigue assessments that were conducted during the previous calendar year for any individual identified in § 26.4(a) through (c). The summary shall include:

(i) The conditions under which each fatigue assessment was conducted (i.e., self-declaration, for cause, post-event, followup);

(ii) A statement of whether or not the individual was working on outage activities at the time of the self-declaration or condition resulting in the fatigue assessment;

(iii) The category of duties the individual was performing, if the individual was performing the duties described in § 26.4(a)(1) through (a)(5) at the time of the self-declaration or condition resulting in the fatigue assessment; and

(iv) The management actions, if any, resulting from each fatigue assessment.

A sample format for the standard report is provided in appendix G.

16 AUDITS

Reference; 10 CFR Part 26.203(f)

Licensees shall audit the management of worker fatigue as required by § 26.41.

Conduct of audits. Audits shall focus on the effectiveness of the FFD program element, Fatigue Management and shall be conducted by individuals who are qualified in the subject(s) being audited. The individuals performing the audit of the program shall be independent from both the subject FFD program's management and from personnel who are directly responsible for implementing the FFD program.

Audit results. The result of the audits, along with any recommendations, shall be documented and reported to senior corporate and site management. Each audit report shall identify conditions that are adverse to the proper performance of the FFD program, the cause of the condition(s), and, when appropriate, recommended corrective actions. The licensee or other entity shall review the audit findings and take corrective actions, including re-auditing of the deficient areas where indicated, to preclude, within reason, repetition of the condition. The resolution of the audit findings and corrective actions shall be documented.

Timing of Audits. Audits shall be conducted each twenty four months in accordance with the license's audit program.

APPENDIX A

References

1. 10 CFR Part 26, Fitness For duty, dated XXXX

2. EPRI NP-6748, Control-Room Operator Alertness and Performance in Nuclear Power Plants, February 1990

3. NUREG/CR-4248, Recommendations for NRC Policy on Shift Scheduling and Overtime at Nuclear Power Plants, July 1985

APPENDIX B

Example Work Hour Schedules

The following nominal schedules have been reviewed and meet the performance based scheduling criteria of 10 CFR Part 26.

To be provided

APPENDIX C

Waiver Checklist
(See model procedure)

AUTHORIZATION TO WAIVE INDIVIDUAL WORK HOUR LIMITS

Sheet 1 of 3

NOTE

Break – The time from which an individual leaves the site until the time the individual returns to the site. If an individual resides in a recreational vehicle that is parked on site, then the time spent away from the work area in the recreational vehicle is considered a break. If weather or other conditions require the individual to remain at the site, the time for which the individual is not performing job duty functions and is resting is considered a break.

Shift Turnover Time - time used to turnover those projects or support activities that require working two or more shifts.. Shift turnover may only be counted at the end or beginning of shift, not both.

Individual's Name (Multiple individuals may be listed but each individual SHALL be considered on an individual basis.)	Place check mark in the limit that will be exceeded (more than one limit may be exceeded)								
	>16 hours in any 24 hour period	>26 hours in any 48 hour period	>72 hours in any 7 day period	<10 hour break between work periods	<34 hour (consecutive hours) break in previous 9 days	**Breakers Closed Only**			**Breakers Open Only**
						Average <one day off per week if working 8-hour shift	Average < 2 days off per week if working 10-hour shift	Average < 2.5 days off per week if working 12-hour shift	Less than 3 days off every 15 days (non-rolling)
	Does not include Shift Turnover Time					Includes Shift Turnover Time Shift turnover			

Unit Outage _____ Non-Outage _____ (check one)

[1] Evaluation of the need to exceed working hour limits. Consider the effectiveness of the individual as he/she is performing the task.

What job will he/she perform?

_____

_____

NOTE

Examples of adverse to safety conditions (not an all inclusive list):

- Support for returning to service plant equipment required to support Technical Specification requirements or threats to sustained power generation.
- Unexpected absence of personnel requiring individuals to cover to ensure the Operations, Maintenance, Chemistry, Health Physics, or Fire Brigade (this does not include security personnel) required crew complement is maintained.

Why is the work activity considered "adverse to safety"?

_____

_____

_____

How does the work affect the plant? What are the adverse consequences of not repairing this equipment in an expedition manner?

_____

_____

_____

NOTE

When possible, equivalent resources should be utilized before requesting work hour deviations.

Why are other individuals not able to perform the job?

_____

_____

What additional controls will be added, if any, to reduce the likelihood of error?

_____

_____

[2] Will the individual be in compliance with the work hour limits when he/she returns to work on his/her next scheduled day of work? ? ☐ Yes ☐ No

If no, then a new authorization to waive the individual work hour, including a new fatigue assessment, has to be completed prior to allowing the individual to return to work.

[3] What date and time will this waiver expire? Date: _____ Time: _____

NOTES

1. The requesting Supervisor's signature acknowledges the face to face fatigue assessment (Attachments 9.2 and 9.3) has been completed and is attached to the waiver.
2. **Approval** may be obtained per telecom provided the evaluation of the need for the individual to exceed the working hour limits is completed.

Requested by: _____ _____
(Supervisor) (Date)

Approved by: _____ _____
(Operations Shift Manager or designee) (Date)

Records

Forward completed form to General Manager's office _____ (initials)

APPENDIX D

Fatigue Assessment Checklist
(See model procedure)

Assessment of _____ (Employee's name)

Reason for the Fatigue Assessment

☐ Issuance of Waiver (attach self assessment) (Shall be performed not more than 4 hours before the commencement of the extended work hour period.)
☐ For-cause (describe below in comments section)
☐ Self Declaration of Fatigue (attach self assessment)
☐ Post-Event (describe below in comments section)
☐ Follow-up (required when assessment was conducted for-cause or in response to self-declaration, when the employee returned to work with a rest break of less than 10 hours – describe in comments section.)

Comments:

_____

_____

_____

Fatigue Assessment

[1] What type of work environment (e.g., temperature, humidity, confined space, etc) is or will the individual be working in?

_____

_____

[2] If a self declaration was made, based on a review of Attachment 9.2 and any additional information (record below) is the individual:

Mentally alert? ☐ Yes ☐ No
Physically capable of working the extended hours? ☐ Yes ☐ No

_____

_____

[3] If this assessment is being performed as a for cause, post event or follow-up assessment,
then complete Attachment 9.2 as follows:

check other and describe the reason for the assessment
interview the individual using Attachment 9.2 to assess his/her acute and cumulative fatigue, as well as his/her circadian variations in alertness and performance.

[4] Are any precautions suggested to assist in managing the potential for fatigue related errors during the performance of the work activity (e.g., supervisory observation of work in progress, QC checks, or post maintenance tests)?

_____

_____

Restrictions based on Fatigue Assessment

☐ None, the individual may continue to work with no restrictions.

☐ Individual may continue to work but is limited to performing work activities that are NOT risk significant.

☐ Individual may continue current level of work with intermittent oversight as described above. (e.g., increased supervision, peer checks, or independent verifications)

☐ Individual may continue to work after a break period away from work of ____ hours.

Assessment Performed by _____ Date and Time _____

NOTE

If desired, an individual who disagrees with the fatigue assessment may initiate a grievance with the bargaining union, discuss the results with the employee concerns coordinator, or may initiate a condition report. The individual may also discuss his or her concerns with the NRC resident inspector or issue an allegation.

Individual's Acceptance or Non-Acceptance of the Fatigue Assessment

☐ I agree with the assessment.

☐ I disagree with the assessment. (Record bases for disagreement in comments section below. Requires a second assessment by another supervisor)

Individual Being Assessed _____ Date and Time _____

Comments:

_____

_____

Records

Forward to General Manager's office. _____(initials)

APPENDIX E

Example Policy

Policy to be provided

Example Procedure

Title: **Managing Fatigue and Working Hour Limits**

(Comment: this example does not include security –security will be added)

(Comment: this example does not include sanctions which will be added.)

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1.0 PURPOSE

[1] This procedure establishes [Utility's name] policy for managing fatigue in accordance with the 10 CFR 26, Subpart I, *Managing Fatigue.* The requirements of the procedure provide reasonable assurance that the effects of fatigue and degraded alertness on the ability of individuals to safely and competently perform their duties are managed commensurate with maintaining public health and safety.

[2] This procedure establishes:

(a) the responsibilities of the individual and [Utility's name] management as related to managing fatigue;

(b) the process to schedule, track and calculate work hours;

(c) the process for making a self-declaration of fatigue;

(d) the guidance for performing a supervisory fatigue assessment;

(e) the guidance and process used to authorize a waiver of working hour limits;

(f) sanctions; and

(g) the periodic review requirements.

[3] All individuals who are granted unescorted access or who are required to physically report to the Technical Support Center or Emergency Operations Facility, in accordance with the licensee's emergency plans and procedures, are subject to the fatigue management program.

[4] The work hour controls apply to individuals who perform duties within the following job duty groups:

(a) Operating or on-site directing (see definitions) of the operation of systems and components that a risk-informed evaluation process has shown to be significant to public health and safety;

(b) Maintenance or on-site directing (see definitions) the maintenance of structures, systems and components (SSCs) that a risk-informed evaluation process has shown to be significant to public health and safety;

(c) Performing Health Physics or Chemistry duties required as a member of the on-site emergency response organization minimum shift complement;

(d) Performing the duties of a Fire Brigade member who is responsible for understanding the effects of fire and fire suppressants on safe shutdown capability;

(e) Performing security duties as an armed security force officer, alarm station operator, response team leader, or watchperson, (i.e., security personnel) (Note: Work hours for security personnel are cover by [procedure #]); and

(f) Other personnel outside the above defined groups who may be directing (see definitions) activities of the defined job duty groups.

[5] This procedure is applicable to upper level management personnel if the upper level management person assumes the responsibilities of directing the operations or maintenance activities that a risk-informed evaluation process has shown to be significant to public health and safety.

[6] This procedure is applicable to all [Utility's name] and site contract personnel who are performing or directing any of the job functions listed in 1.0 [4].

[7] The working hour controls do not apply:

(a) during declared plant emergencies as defined by the plant's emergency plan (i.e., an emergency class declaration of Notification of Unusual Event or higher). (From 10 CFR 26.207(d));

(b) when participating in the actual conduct of an unannounced emergency preparedness exercises and drills (From 10 CFR 26.205(b)(4));

(c) when an individual's work hours are unscheduled work performed off-site (e.g., technical assistance provided by telephone from an individual's home) provided the total duration of the work does not exceed a nominal 30 minutes during any single break period. The time associated with the unscheduled off-site work activity does not constitute a work period or work shift. (From 10 CFR 26.205(b)(5)).

2.0 REFERENCES

[1] 10 CFR 26, Fitness for Duty Program

[2] Federal Register August 26, 2005 (RIN 3150-AF12) pages 50442 through 50677

3.0 DEFINITIONS

A day off means a calendar day in which an individual does not start a work shift.

Acute fatigue means fatigue from causes (e.g., restricted sleep, sustained wakefulness, task demands) occurring within the past 24 hours.

Alertness means the ability to remain awake and sustain attention.

Break is defined as an interval of time that falls between successive work periods, during which the individual does not perform any duties for the licensee other than one period of shift turnover at either the beginning or end of a shift but not both.

Circadian variation in alertness and performance means the increases and decreases in alertness and cognitive/motor functioning caused by human physiological processes (e.g., body temperature, release of hormones) that vary on an approximately 24-hour cycle.

Contract/vendors means contractors and vendors performing work on-site.

Covered individual means an individual subject to work hour controls. Any individual granted unescorted access to a nuclear power plant protected areas who performs duties within the following job duty is a covered individual subject to work hour controls:

- Operating or on-site directing of the operation of systems and components that a risk-informed evaluation process has shown to be significant to public health and safety;
- Performing maintenance or on-site directing of the maintenance of structures, systems, and components (SSCs) that a risk-informed evaluation process has shown to be significant to public health and safety;
- Performing Health Physics or Chemistry duties required as a member of the on-site emergency response organization minimum shift complement;
- Performing the duties of a Fire Brigade member who is responsible for understanding the effects of fire and fire suppressants on safe shutdown capability; and
- Performing security duties as an armed security force officer, alarm station operator, response team leader, or watchperson, hereinafter referred to as security personnel.

Cumulative fatigue means the increase in fatigue over consecutive sleep-wake periods resulting from inadequate rest.

Directing means the exercise of control over a work activity by an individual who is directly involved in the execution of the work activity, and either makes technical decisions for that activity without subsequent technical review, or is ultimately responsible for the correct performance of that work activity.

Eight (8)-hour shift schedule means a schedule that averages not more than 9 hours per workday over the entire shift cycle.

Fatigue means the degradation in an individual's cognitive and motor functioning resulting from inadequate rest.

Increased threat condition means an increase in protective measure level, relative to the lowest protective measure level applicable to the site during the previous 60 days, as promulgated by an NRC advisory.

Onsite means within the protected area of the nuclear power plant.

Security personnel means armed security force officer, alarm station operator, response team leader, or watchperson.

Shift cycle means a series of consecutive work shifts and days off that is planned by the licensee to repeat regularly, thereby constituting a continuous shift schedule.

Ten (10)-hour shift schedule means a schedule that averages more than 9 hours, but not more than 11 hours, per workday over the entire shift cycle.

Twelve (12)-hour shift schedule means a schedule that averages more than 11 hours, but not more than 12 hours, per workday over the entire shift cycle.

Work Hours means the amount of time an individual performs duties for the licensee. This includes all work hours, with the following exceptions:

- Shift turnover time;
- Within-shift break and rest periods in which there is a reasonable opportunity and accommodation for restorative sleep;
- Unannounced emergency preparedness exercises and drills; and
- Incidental duties performed off-site provided the total duration of the work does not exceed a nominal 30 minutes during any single break period.

Unit outage means that the reactor unit is disconnected from the electrical grid.

4.0 RESPONSIBILITIES

[1] The Operations Shift Manager or a site senior level manager with requisite signature authority - is responsible for determining that a work hour waiver is necessary to mitigate or prevent a condition adverse to safety.

[2] The General Manager, Plant Operations (GM) - is responsible to ensure that a semi-annual review is performed to monitor overtime hours worked and ensure that excessive hours have not been assigned.

[3] The Manager or Supervisor of the individual who will be issued a waiver to exceed the working hour limits established in this procedure is responsible for: (This responsibility may be performed by any manager or supervisor who is qualified to provide oversight of the work to be performed by the individual (From 10 CFR 26.207(1)(ii)), if the individual's supervisor or manager is not on site.)

(a) Evaluating the employee's fitness to work the extended hours before granting the waiver by performing a face-to-face assessment.

(b) Evaluating the employee's performance and continued Fitness For Duty (FFD) while working extended hours.

[4] Each Department Head - is responsible for:

(a) Providing guidelines for the overtime selection process as required by the union contract and the fitness for duty requirements outlined in [Utility's procedure #], *Fitness for Duty Program.*

(b) Communicating the requirements of this procedure to appropriate personnel within his/her department.

(c) Maintaining a record of the shift schedules and shift cycles used for at least the past 3 years or longer, if legal proceedings are ongoing, for those individuals who are subject to work hour controls (Step 5.4) (From 10 CFR 26.203(d)(2))

[5] Each Requesting Supervisor - is responsible for ensuring authorization for issuance of a waiver to exceed working hour limits is obtained prior to allowing an individual to exceed these limits.

[6] Each Employee ([Utility] or Contract) - is responsible for:

(a) Evaluating his/her personal fitness to work based on impairment from fatigue.

(b) Making a self-declaration of fatigue and discussing his/her concerns with supervision or management in cases when he/she feels his/her performance may be impaired.

(c) Verifying his/her working hours are correctly documented regardless of whether he/she is paid for the hours worked. (From 10 CFR 26.203(d)(1))

(d) Reporting concerns related to other individuals' fitness to work based on impairment from fatigue.

(e) Being available at work for a face-to-face fatigue assessment.

(f) Being aware of the total hours worked in the previous 14 days and notifying management if working hour limits will be exceeded if asked to work additional work hours beyond the normal scheduled hours.

5.0 DETAILS

5.1 PRECAUTIONS AND LIMITATIONS

None

5.2 BACKGROUND

An individual's ability to safely and competently perform his or her duties is not solely based on the individual's work hours or that the individual has had adequate rest breaks. Fatigue can be caused by numerous things including such things as long hours of work, inadequate rest between work periods, sleep disorders, sedentary lifestyle, work problems or dissatisfaction, home finances and relationships, inadequate nutrition, emotional stress, physical stress, prescription drugs, and mental or physical illness. Fatigue may lead to decreased alertness. When an individual is alert, he or she may be more focused and better able to pay attention. Fatigue and decreased alertness can substantively degrade an individual's ability to safely and competently perform his or her duties. Fatigue management is part of [Utility's] overall fitness for duty (FFD) program.

The responsibility for ensuring that each individual is fit to safely and competently perform his or her duties is shared between [Utility] management and the individuals and their co-workers who perform duties on behalf of [Utility].

5.3 INDIVIDUALS SUBJECT TO MANAGING FATIGUE

[1] All persons who are granted unescorted access to nuclear power reactor protected areas and all persons who are required to physically report to the Technical Support Center or Emergency Operations Facility, in accordance with the site Emergency Plan and procedures shall be subject to Managing Fatigue. (From 10 CFR 26.4 (b))

[2] Each individual described in 5.3[1] may make a self declaration that he/she is not fit to safely and competently perform his/her duties because of fatigue.

[3] Each individual described in 5.3[1] is subject to the fatigue assessment process for the following conditions: 1) For-Cause; 2) Self-Declaration; 3) Post-event; and 4) Follow-up. (See Section 5.9 for more detail related to the Fatigue Assessments).

5.4 INDIVIDUALS SUBJECT TO WORK HOUR CONTROLS (From 10 CFR 26.4 (a))

[1] Work hour limits are applicable to any individual ([Utility] employee or contractor) who performs duties within the following job duty groups:

- Operating or onsite directing (see definitions) of the operation of systems and components that a risk-informed evaluation process has shown to be significant to public health and safety;

- Performing maintenance or on-site directing (see definitions) of the maintenance of structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety;

- Performing Health Physics or Chemistry duties required as a member of the on-site emergency response organization minimum shift complement;

- Performing duties of a Fire Brigade member who is responsible for understanding the effects of fire and fire suppressants on safe shutdown capability.

- Performing security duties as an armed security force office, alarm station operator, response team leader, or watchperson, (i.e., security personnel). (See [Utility Procedure #] for work hour controls for security personnel.)

5.5 SCHEDULING WORK HOURS (From 10 CFR 26.205(c))

[1] Work hours shall be scheduled in a manner that is consistent with the objective of preventing impairment from fatigue due to the duration, frequency, or sequencing of successive shifts. Human alertness and the propensity to sleep vary markedly through the course of a 24-hour period. These results are referred to as circadian rhythms.

[2] Suggested outage and non-outage schedules that meet these requirements are included in Attachment 9.5.

5.6 WORK HOUR CONTROLS

[1] Non-Outage Work Hour Limits

(a) An individual's work hour limits shall not exceed the following limits, without the issuance of a waiver (see Section 5.8 for the discussion on waivers): (From 10 CFR 26.205(d))

(1) 16 work hours in any 24-hour period; (From 10 CFR 26.205(d)(1)(i))

(2) 26 work hours in any 48-hour period; (From 10 CFR 26.205(d)(1)(ii))

(3) 72 work hours in any 7-day period; (From 10 CFR 26.205(d)(1)(iii))

(b) Break (see Definitions) Requirements

(1) A 10-hour break between successive work periods or an 8-hour break between successive work periods when a break of less than 10 hours is necessary to accommodate a crew's scheduled transition between work schedules or shifts (From 10 CFR 26.205(d)(2)(i));

(2) A 34-hour break in any 9-day period (From 10 CFR 26.205(d)(2)(ii));

(c) Days off (see Definitions)

(1) For those on 8-hour shifts, each individual shall have at least one (1) day off per week averaged over the shift cycle (From 10 CFR 26.205(d)(3)(i));

(2) For those on 10-hour shifts, each individual shall have an average of two (2) days off per week averaged over the shift cycle (From 10 CFR 26.205(d)(3)(ii)); and

(3) For those on 12-hour shifts, each individual shall have an average of 2.5 days off per week per week averaged over the shift cycle (From 10 CFR 26.205(d)(3)(iii)).

[2] Outage Work Hours

(a) An individual's work hour limits shall not exceed the following limits, without the issuance of a waiver (see Section 5.8 for the discussion on waivers): (From 10 CFR 26.205(d)(4))

(1) 16 work hours in any 24-hour period; (From 10 CFR 26.205(d)(1)(i))

(2) 26 work hours in any 48-hour period; (From 10 CFR 26.205(d)(1)(ii))

(3) 72 work hours in any 7-day period; (From 10 CFR 26.205(d)(1)(iii))

(b) Break (See Definitions) Requirements

(1) a 10-hour break between successive work periods or an 8-hour break between successive work periods when a break of less than 10 hours is necessary to accommodate a crew's scheduled transition between work schedules or shifts; (From 10 CFR 26.205(d)(2)(i));

(2) a 34-hour break in any 9-day period (From 10 CFR 26.205(d)(2)(ii)); and

Note

When an individual works during two or more unit outages and the interval(s) between successive outages is less than 2 weeks, the following break requirements are based upon the number of days that have elapsed since the first unit outage in the series began. (From 10 CFR 26.205(d)(4)(iv))

(c) Days Off (See definitions)

(1) During the first 60 days of a unit outage, at least 3 days off in each successive (i.e., non-rolling) 15-day period (From 10 CFR 26.205(d)(4)(i)); and

(2) The break requirements associated with the 60-day outage may be extended for each individual in 7-day increments for each non-overlapping 7-day period in

which the individual has worked not more than 48 hours during the unit outage. (From 10 CFR 26.205(d)(4)(iii))

5.7 CALCULATING WORK HOURS

[1] Individual Limits

(a) Work hours are calculated as the amount of time an individual performs any duties for [Utility], including all within-shift break times and rest periods during which there are no reasonable opportunities or accommodations appropriate for restorative sleep. Activities that shall be included in work hour calculations, but are not limited to, are shift holdovers to cover for late arrivals of incoming shift members; early arrivals of individuals for meetings, training, or pre-shift briefings for special evolutions; and holdovers for interviews needed for event investigations. (From 10 CFR 26.205(b))

(b) Shift turnover activities are not included. Shift turnover includes only those activities that are necessary to safely transfer information and responsibilities between two or more individuals between shifts. Shift turnover activities may include, but are not limited to, discussions of the status of plant equipment, and the status of ongoing activities, such as extended tests of safety systems and components. Shift turnover can only be counted one time, either at the beginning or the end of a shift. (From 10 CFR 26.205(b)(1))

(c) To ensure the individual limits are not exceeded the following guidance will be used:

(1) Work hours are considered on a rolling basis. The periods of any "24-hours," "48-hours," and "7-days" are rolling time periods. Hours worked should be evaluated to determine if any limit will be exceeded based on the work schedule by picking a future time (T) on the work schedule and asking how many hours will have been worked during the T-24 hour, T-48 hour, or T-168 hours (T-7 days) (i.e., a backwards look at the number of hours that have or will have been worked based on a time in the future). If a work hour limit will be exceeded, it shall be identified BEFORE the hours are worked. For example, if an individual is requested to work from 0700 to 1900 on Friday, the following should be considered prior to working the additional hours:

- All hours worked during the 24 hour period prior to the stop time on Friday as reflected in the request to work additional hours to determine if more than 16 hours in any 24-hour period will be exceeded.

- All hours worked during the 48 hour period prior to the stop time on Friday as reflected in the request to work additional hours to determine if more than 26 hours in any 48-hour period.

- All hours worked during the 7-days prior to the stop time on Friday (i.e., T-168 hours) as reflected in the request to work additional hours to determine if more than 72 hours in any 7-day period will be exceeded.

- The period is NOT re-zeroed, or the "clock reset" following a day off or after obtaining authorization to exceed limits.

[2] Within-Shift breaks and rest periods (From 10 CFR 26. 205(b)(2))

(a) Only that portion of a break or rest period during which there is a reasonable opportunity and accommodations for restorative sleep may be excluded.

(b) Time spent at lunch although considered non-productive time, is included in the work hour calculation.

(c) Any other break time allowed during the scheduled work day that does not allow opportunity or accommodations for restorative sleep is included in the work hour calculation.

[3] Paid Time Not Included in the Calculation

(a) Holidays Worked - Hours worked on holidays that are recorded to gain holiday pay do not count in the calculation of actual hours worked. (i.e., 21 hours of pay may be applicable if an individual works on a holiday (8 hours holiday pay, 12 hours work, 1 hour shift turnover time). Only the 12 hours actually worked is included in the calculation.

(b) Vacation time – this is time away from work and is not included in the calculation.

(c) Sick leave – this is time away from work and is not included in the calculation.

(d) Personal leave – this is time away from work and is not included in the calculation.

[4] Beginning or Resuming Duties Subject to Work Hour Controls

(a) If an individual begins or resumes performing duties within the any of the work groups included in step 5.4[2], then all of the individual's work hours worked, including hours worked performing other duties are counted when calculating his/her work hours for the purposes of monitoring compliance with the work hour limits defined in section 5.6. (From 10 CFR 26. 205(b)(3))

[5] Call-in

(a) When calculating work hours, only the time the individual is on site is counted (although he/she may be paid more hours based on the Union contract).

(b) A call-in is considered an extension of the normal work schedule.

[6] Daylight Savings Time

(a) When working during the change from daylight saving time back to standard time, a waiver should not be required.

[7] Other

(a) Unannounced emergency preparedness exercises and drills may be excluded from the calculation of an individual's work hours (From 10 CFR 26. 205(b)(4))

(b) Incidental duties performed off-site may be excluded in the work hour calculation if total duration of the work is less than a nominal 30 minutes during any single break period. This duty is not considered a work period or a work shift. (From 10 CFR 26. 205(b)(5))

5.8 WAIVERS (From 10 CFR 26.207)

[1] Waivers from the work hour controls(Section 5.6) may be granted to address those circumstances that could not have been reasonably controlled (From 10 CFR 26. 207(a)(2))as follows:

(a) Individuals who can authorize waivers (From 10 CFR 26.207(a)(1)(i))

(1) An operations shift manager determines that the waiver is necessary to mitigate or prevent a condition adverse to safety, or

(2) A security shift manager determines that the waiver is necessary to maintain the security of the facility, or

(3) A site senior-level manager with requisite signature authority makes either of the above determinations (paragraph 5.8[1](a)(1) or 5.8[1](a)(2)).

(b) Completion of Attachments 9.1, 9.2, and 9.3 is required for to authorize a waiver.

[2] A fatigue assessment shall be performed for the individual(s) who will be issued the waiver from the work hour controls (From 10 CFR 26.207 (a)(1)(ii))

(a) The individual(s) who will work extended hours shall complete Attachment 9.2.

Note
An on–shift licensed Senior Reactor Operator (SRO) may be the supervisor who performs the face to face fatigue assessment if he/she (the SRO) is qualified to provide oversight of the work to be

performed (From 10 CFR 26.207(a)(1)(ii)) and is trained in accordance with the Fitness for Duty program to identify the symptoms of worker fatigue and contributors to decreased alertness in the workplace.

(b) A supervisor, with the following qualifications (From 10 CFR 26.207(a)(1)(ii)), shall perform a face to face assessment by completing Attachment 9.3:

- qualified to direct the work to be performed by the individual, and
- who is trained in accordance with the requirements of the Fitness for Duty program and has the knowledge and ability to identify symptoms of worker fatigue and contributors to decreased alertness in the workplace.
- whether any controls and conditions should be established under which the individual will be permitted to perform the work.

(c) The supervisory face to face assessment shall be performed no more than 4 hours before the individual begins performing any work under the waiver.

[3] Waivers from the individual work hour limits are granted on an individual basis and cannot be granted for an entire on-shift staff. (From 10 CFR 26.207(a)(3))

[4] A new waiver shall be issued each day during the period of time an individual is exceeding the work hour limits. For example an individual has worked 6 12-hour days (0700-1900) (72 hours),

(a) On day 7 the individual works 12 hours (0700-1900) – a waiver is required for exceeding 72 hours in any 7-day period.

(b) On day 8 the individual works 6 hours (0700-1300) – a new waiver is required for exceeding 72 hours in any 7-day period.

(c) On day 9, 10, and 11 the individual is off work. For this example, when the individual returns to work on day 12 a waiver is not required. However, if fewer days off had been granted, a new waiver may have been required.

5.9 FATIGUE ASSESSMENTS (From 10 CFR 26.209 and 211)

[1] All fatigue assessments shall be performed face-to-face by a supervisor or staff member of the Fitness for Duty program who is trained in accordance with the Fitness for Duty program. (From 10 CFR 26.211(b))

[2] Self Declaration

(a) An individual may make a self-declaration of fatigue to his or her supervisor at anytime by completing Attachment 9.2. (From 10 CFR 26.4(b))

(1) A fatigue assessment of the individual is required unless the individual is allowed to take a rest break of 10 hours before the individual returns to duty. (From 10 CFR 26.211(a)(2))

(2) If a break is allowed, the individual shall take personal time off. Vacation or sick leave or if necessary, time-off without pay, may be required if he/she is not able to complete the scheduled number of work hours for the day.

(3) If a break is not allowed, to ensure the work activity is being performed correctly and safely, the following controls (and others, if deemed appropriate) may be established :

- Additional peer checks
- Additional stop points
- Additional supervisory oversight

(4) If upon completion of the fatigue assessment, the individual disagrees with the assessment, perform the following:

a. The individual being assessed shall document the basis for his/her disagreement on Attachment 9.3.

b. A second fatigue assessment will be performed by another qualified supervisor or a staff member of the FFD program.

c. If the second assessment results in the same conclusions as the first assessment, the individual being assessed may:

- initiate a grievance with the bargaining union,
- discuss the results with the employee concerns coordinator,
- initiate a condition report,
- discuss his or her concerns with the NRC resident inspector, or
- issue an allegation to the NRC for investigation

(b) If an individual who is performing or being assessed to work under a waiver declares that he or she is unable to safely and competently perform his or her duties, then the follow actions shall be taken: (From 10 CFR 26.209(a)).

(1) The supervisor shall immediately stop the individual from performing his or her duties unless the individual is required to continue those duties for other reasons (e.g., Operations shift complement required by 10 CFR 50.54(m) or individual is required to fill Emergency Response Organization (ERO) role). Immediate actions shall be taken to relieve the individual.

(2) Following self-declaration or relief from performing the duties, the individual:

- May be reassigned to duties other than those listed in paragraph 5.4 but only if the fatigue assessment indicates the individual is fit to safely and competently perform the other duties, and

- Shall be permitted or required to take a break of at least 10 hours before the returning to performing the duties listed in paragraph 5.4.

(3) A fatigue assessment shall be conducted unless the individual is permitted or required to take a rest break of at least 10 hours before returning to duty. (From 26.211(a)(2))

(c) If the individual has made a self declaration and was given to 10-hour break period and returns to work following a break of less than 10-hours, then the individual shall be reassessed for fatigue. If deemed necessary based on the work activity, controls similar to those listed in step 5.9[2](a)(3) may be applied. (From 10 CFR 26.211(a)(4))

[3] For Cause

(a) A fatigue assessment shall be conducted in response to an observed condition of impaired individual alertness creating a reasonable suspicion that an individual is not fit to safely and competently perform his or her duties, except if the impairment is observed during an individual's break period. (From 10 CFR 26.211(a)(1))

(b) If the observed condition is impaired alertness with no other behaviors or physical conditions creating a reasonable suspicion of possible substance abuse, then only a fatigue assessment is required. (From 10 CFR 26.211(a)(1))

(c) If there is a reasonable assurance that the observed condition is not due to fatigue, then a fatigue assessment is not required. (From 10 CFR 26.211(a)(1))

(d) The individual who observed the condition of impairment shall not conduct the fatigue assessment. (From 10 CFR 26.211(b)(1))

(e) If the individual was given to 10-hour break period and returns to work following a break of less than 10-hours, then the individual shall be reassessed for fatigue. If deemed necessary based on the work activity, controls similar to those listed in step 5.9[2](a)(3) may be applied. (From 10 CFR 26.211(a)(4))

[4] Post Event

(a) A fatigue assessment shall be conducted as soon as possible after an event involving a human error that was committed by an individual who is performing the duties defined in paragraph 5.4. The fatigue assessment may be delayed if medical treated is required. The fatigue assessment is required if the event resulted in:

(1) a significant illness or personal injury to the individual or to another individual, which within 4 hours after the event is recordable under the Department of labor standards contained in 29 CFR 1907.4 and subsequent amendments and results in death, days away form work, restricted work, transfer to another job, medical treatment beyond first aid, loss of consciousness, or other significant illness or injury as diagnosed by a physician or other licensed health care professional, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid , or loss of consciousness; or (From 10 CFR 26. 31(c)3)(i)),

(2) a radiation exposure or release of radioactivity in excess of regulatory limits; or (From 10 CFR 26. 31(c)3)(ii)),

(3) actual or potential substantial degradations of the level of safety of the plant. (From 10 CFR 26. 31(c)3)(iii)).

(b) The individual who performs the fatigue assessment shall not have (From 10 CFR 26.211(b)(2)):

(1) performed or directed the work activities during which the event occurred;

(2) performed within 24 hours before the event occurred, a fatigue assessment of the individuals who were performing or directing the work activities during which the event occurred; and

(3) evaluated or approved a waiver for any of the individuals who were performing or directing the work activities during which the event occurred, if the event occurred while the individuals were performing work under that waiver.

[5] Follow-up (From 10 CFR 26.211(a)(4))

(a) If a fatigue assessment was performed "for cause" and the individual returns to his or her job duty defined in paragraph 5.4 following a rest break of less than 10 hours, then

the individual and consideration of a need to implement controls or conditions before permitting the individual to resume work shall be reassessed.

(b) If a fatigue assessment was performed in response to a self declaration and the individual returns to his or her job duty defined in paragraph 5.4 following a rest break of less than 10 hours, then the individual and consideration of a need to implement controls or conditions before permitting the individual to resume work shall be reassessed.

[6] The fatigue assessment (Attachments 9.2 and 9.3, collectively) shall address the following factors:

(a) acute fatigue;

(b) cumulative fatigue;

(c) circadian variations in alertness and performance;

(d) the circumstances that necessitated the fatigue assessment; and

(e) implementation of controls and conditions, if any, that are necessary to permit the individual to resume performing work duties. This might include requiring the individual to take a rest break.

[7] A close out (Attachment to be provided) should be conducted and address the following:

(a) Hours actually worked, beyond limits, under this waiver.

(b) Did the individual perform satisfactorily?

(c) Name, Signature and date of job supervisor or individual for whom waiver was granted.

5.10 DOCUMENTING HOURS WORKED

[1] Each [Utility] employee is responsible for ensuring his or her working hours are documented in xx.

[2] Each site Contract employee is responsible for documenting his or her working hours regardless of whether payment is received for the hours worked and obtaining approval by an [Utility] supervisor.

[3] Time worked to accommodate shift turnover shall be documented using a separate time code from normal time or overtime worked.

5.11 SEMI-ANNUAL REVIEW

[1] A semi-annual review of working hours of applicable personnel shall be performed to ensure that excessive hours have not been assigned. At a minimum, the reviews shall be conducted twice per calendar year. The two reviews need not cover periods of equal duration but must collectively cover the entire calendar year. If any plant or security system outages or increased threat conditions occurred since the most recent review was completed , the review shall include an evaluation of the control of work hours during the outages or increased threat conditions.

[2] The review shall be completed within 30 days of the end of the review period.

[3] The General Manager, Plant Operations is responsible to ensure that the review is completed.

[4] The review is accomplished by completing a review in accordance with Attachment 9.4.

5.12 ANNUAL FFD PROGRAM PERFORMANCE REPORT

[1] An annual FFD program performance report shall be submitted to the NRC in the standard format provided in Attachment 9.6:

5.13 SCANCTIONS –To be provided

6.0 INTERFACES

None

7.0 RECORDS

[1] Completed copies of the following shall be retained for at least three years:

(a) Authorization to Waive Individual Work Hour Limits (Attachment 9.1). (From 10 CFR 26.203(d)(3))

(b) Self Assessment of Fatigue (Attachment 9.2). (From 10 CFR 26.203(d)(3))

(c) Fatigue Assessment (Attachment 9.3). (From 10 CFR 26.203(d)(3) and (d)(5))

(d) Review of Working Hours (Attachment 9.4). (From 10 CFR 26.203(d)(4))

(e) Records of individual work hours for those who are subject to work hour controls (From 10 CFR 26. 203(d)(1))

(f) Records of the shift schedules and shift cycles for those who are subject to work hour controls (From 10 CFR 26. 203(d)(2))

8.0 OBLIGATIONS AND COMMITMENTS IMPLEMENTED BY THE PROCEDURE

8.1 OBLIGATIONS AND COMMITMENTS IMPLEMENTED OVERALL

[Utility specific]

8.2 SECTION SPECIFIC OBLIGATIONS AND COMMITMENTS

[Utility specific]

8.3 SITE SPECIFIC COMMITMENTS

[Utility specific]

9.0 ATTACHMENTS

9.1 AUTHORIZATION TO WAIVE INDIVIDUAL WORK HOUR LIMITS
9.2 SELF ASSESSMENT OF FATIGUE
9.3 FATIGUE ASSESSMENT
9.4 SEMI-ANNUAL REVIEW OF WORKING HOURS
9.5 SUGGESTED WORK HOUR SCHEDULES
9.6 ANNUAL FFD PROGRAM PERFORMANCE REPORT

NOTE

Break – The time from which an individual leaves the protected area until the time the individual returns to the site. If weather or other conditions require the individual to remain at the protected area, the time for which the individual is not performing job duty functions and is resting.

Shift Turnover Time - time used to turnover those projects or support activities that require working two or more shifts. Shift turnover may only be counted at the end or beginning of shift, not both.

Individual's Name (Multiple individuals may be listed but each individual SHALL be considered on an individual basis.)	Place check mark in the limit that will be exceeded (more than one limit may be exceeded)								
	>16 hours in any 24 hour period	>26 hours in any 48 hour period	>72 hours in any 7 day period	<10 hour break between work periods	<34 hour (consecutive hours) break in previous 9 days	**Breakers Closed Only**			**Breakers Open Only**
						Average <one day off per week if working 8-hour shift	Average < 2 days off per week if working 10-hour shift	Average < 2.5 days off per week if working 12-hour shift	Less than 3 days off every 15 days (non-rolling)
	Does not include Shift Turnover Time					Includes Shift Turnover Time Shift turnover			

Unit Outage _____ Non-Outage _____ (check one)

[1] Evaluation of the need to exceed working hour limits. Consider the effectiveness of the individual as he/she is performing the task.

(a) What job will he/she perform?

_____

_____

NOTE

Examples of adverse to safety conditions (not an all inclusive list):

- Support for returning to service plant equipment required to support Technical Specification requirements or threats to sustained power generation.
- Unexpected absence of personnel requiring individuals to cover to ensure the Operations, Maintenance, Chemistry, Health Physics, or Fire Brigade (this does not include security personnel) required crew complement is maintained.

(b) Why is the work activity considered "adverse to safety"?

_____

_____

_____

(c) How does the work affect the plant? What are the adverse consequences of not repairing this equipment in an expedition manner?

_____

_____

_____

NOTE

When possible, equivalent resources should be utilized before requesting work hour deviations.

(d) Why are other individuals not able to perform the job?

_____

_____

(e) What additional controls will be added, if any, to reduce the likelihood of error?

_____

_____

[2] Will the individual be in compliance with the work hour limits when he/she returns to work on his/her next scheduled day of work? ? ☐ Yes ☐ No

(a) If no, then a new authorization to waive the individual work hour, including a new fatigue assessment, has to be completed prior to allowing the individual to return to work.

[3] What date and time will this waiver expire? Date: _____ Time: _____

NOTES

3. 1. The requesting Supervisor's signature acknowledges the face to face fatigue assessment (Attachments 9.2 and 9.3) has been completed and is attached to the waiver.
4. **2. Approval** may be obtained per telecom provided the evaluation of the need for the individual to exceed the working hour limits is completed.

Requested by: _____ _____
(Supervisor) (Date)

Approved by: _____ _____
(Operations Shift Manager or designee) (Date)

Records

Forward completed form to General Manager's office (includes Attachments 9.2 and 9.3). _____ (initials)

Check the following, as appropriate:

- ☐ Self Assessment of Fatigue being performed to obtain a waiver
- ☐ Self Declaration of Fatigue
- ☐ Other, describe _____

[1] How many hours have you worked in the last 14 days?

_____

[2] What work schedule have you worked in the last 14 days? (e.g., 3 nights (1900-0700) followed by 2 days off, 4 days (0700-1900), followed by 1 day off, 4 days (0700-1900)) (assessing circadian variations in alertness and performance)

_____

[3] How many hours have you worked since your last break period? _____

[4] How long was the last break period away from work? _____

[5] If the last break period was less than 34 hours, how many consecutive days in a row have you worked since the last 34 hour break period? _____

[6] If you performed incidental duties off-site(see definitions), how much time was associated with the activity? _____

[7] How many hours per day have you worked since your last 34 hour break period?

_____

[8] How many hours of sleep have you had in the last 24 hours (assessing acute fatigue)?

_____

[9] How many hours of sleep have you averaged each day in the last 9 days (assessing cumulative fatigue)? _____

[10] Are you scheduled to perform risk significant work activities today? ☐ Yes ☐ No

[11] Describe the task you have been asked to perform:

_____

_____

[12] Do you feel you can perform the task without oversight (e.g., intermittent or constant supervision or peer reviews or independent reviews)? ☐ Yes ☐ No

[13] If you feel oversight is needed, what level of oversight do you feel is needed? (Otherwise, N/A)_____

[14] Are you mentally alert? ☐ Yes ☐ No

[15] If working extended hours, are you physically capable of working the extended hours?

☐ Yes ☐ No ☐ N/A

Comments:

_____

_____

Performed by: _____ Signature_____ Date _____
(Print Name)

Assessment of _____ (Employee's name)

Reason for the Fatigue Assessment

- ☐ Issuance of Waiver (attach self assessment) (Shall be performed not more than 4 hours before the commencement of the extended work hour period.)
- ☐ For-cause (describe below in comments section)
- ☐ Self Declaration of Fatigue (attach self assessment)
- ☐ Post-Event (describe below in comments section)
- ☐ Follow-up (required when assessment was conducted for-cause or in response to self-declaration, when the employee returned to work with a rest break of less than 10 hours – describe in comments section.)

Comments: _____

_____

_____

Fatigue Assessment

[1] What type of work environment (e.g., temperature, humidity, confined space, etc) is or will the individual be working in?

_____

_____

[2] If a self declaration was made, based on a review of Attachment 9.2 and any additional information (record below) is the individual:

(a) Mentally alert? ☐ Yes ☐ No

(b) Physically capable of working the extended hours? ☐ Yes ☐ No

_____

_____

[3] If this assessment is being performed as a for cause, post event or follow-up assessment, then complete Attachment 9.2 as follows:

(a) check other and describe the reason for the assessment

(b) interview the individual using Attachment 9.2 to assess his/her acute and cumulative fatigue, as well as his/her circadian variations in alertness and performance.

[4] Are any precautions suggested to assist in managing the potential for fatigue related errors during the performance of the work activity (e.g., supervisory observation of work in progress, QC checks, or post maintenance tests)?

_____

_____

Restrictions based on Fatigue Assessment

☐ None, the individual may continue to work with no restrictions.

☐ Individual may continue to work but is limited to performing work activities that are NOT risk significant.

☐ Individual may continue current level of work with intermittent oversight as described above. (e.g., increased supervision, peer checks, or independent verifications)

☐ Individual may continue to work after a break period away from work of ____ hours.

Assessment Performed by _____ Date and Time _____

NOTE

If desired, an individual who disagrees with the fatigue assessment may initiate a grievance with the bargaining union, discuss the results with the employee concerns coordinator, or may initiate a condition report. The individual may also discuss his or her concerns with the NRC resident inspector or issue an allegation.

Individual's Acceptance or Non-Acceptance of the Fatigue Assessment

☐ I agree with the assessment.

☐ I disagree with the assessment. (Record bases for disagreement in comments section below. Requires a second assessment by another supervisor)

Individual Being Assessed _____ Date and Time _____

Comments: _____

_____

Records

Verify Attachment 9.2 is attached. _____(initials)

If a waiver is issued, verify Attachment 9.1 in addition to Attachment 9.2 is attached. _____(initials)

Forward to General Manager's office. _____(initials)

Review Period: _____ _____
Date

NOTE

Review shall be completed within 30 days of the end of the review period. (From 10 CFR 26. 205(e))

A review is required to ensure excessive working hours are not assigned to [Utility] and contracted personnel who perform the job functions defined in the Section 5.4 of this procedure. Other groups may be evaluated if desired.

Table 1 provides a review of the individual who were granted more than on waiver during the review period. (From 10 CFR 26.205(e)(1)(ii))

Table 2 provides a list of individuals whose actual hours worked exceeded an average of 54 hours per week in any shift cycle. (From 10 CFR 26.205(e)(1)(i))

Table 3 provides a summary of fatigue assessments that were performed for reasons other than authorization of a waiver to exceed the individual work hour limits. (From 10 CFR 26.205(e)(1)((iii))

Review Criteria

1. Does each individual listed in Table 1 have an approved authorization and fatigue assessment for each limit that was exceeded? Yes No (Circle One)

2. **IF** no approved authorization exists or if no fatigue assessment exists or if neither exist for any individual listed in Table 1, **THEN** initiate a Condition Report (CR) and list the number in the Comments section below (otherwise N/A). _____ (Initials)

3. Attach the approved waiver authorization forms and fatigue assessments for each individual listed in Table 1, unless otherwise noted in the comments section. _____ (Initials)

Comments:

_____

_____

Performed by: _____ Date: _____

4. Does the staffing level for each group remain adequate? (From 10 CFR 26. 205(e)(2)) Yes No (Circle One)

Final Review: _____ Date: _____
(General Manager or Designee)

5. When Review is complete, forward to Records for retention (Records must be retained for 3 years). _____ (Initials)

Check One: Departmental Review: _____ Site Review: _____ (If a Departmental Review, verify reviews are completed by each affected department (i.e., Operations, Maintenance, Health Physics, and Chemistry). Attach each Departmental Review to Attachment 9.4)

Check One: Non-outage period: _____ Outage Period: _____(Separate Tables are required for outage and non-outage periods)

Table 1
Individuals Who Were Granted One or More Waivers during the Review Period
(From 10 CFR 26.205(e)(1)(ii)
(Use additional pages as needed)

Individual's Name	For each individual, list the number of times the designated limit that was exceeded.						
	Applicable at all times					Applicable when breakers are closed	Applicable when breakers are open
	> 16 hours in any 24 hour period	> 26 hours in any 48 hour period	> 72 hours in any 7 day period	< 10 hour break between work periods	< 34 hours off every rolling 9 days	<Average Days off during Shift Cycle	<3 days off every 15 days

Table 2
List of Individuals Who Averaged >54 hours / week during any shift cycle (see Definitions)
(From 10 CFR 26. 205(e)(1)(i))
(Use Additional Pages as needed)

Individual's Name	Actual Hours Worked

Table 3
Fatigue Assessment Review
(Use Additional Pages as needed)

This table includes a list of those individuals for which a fatigue assessment was performed for reasons other than the issuance of a waiver. If management actions were assigned as a result of the fatigue assessment, include the actions in the comments section below (e.g., note 1, note, 2).

Individual who was assessed	Department	Check one		Check reason for assessment			
		Non-Outage	Outage	Self Declaration	For Cause	Post Event	Follow-up
Total # issued during each period and type of assessment performed.							

Comments: _____

Sheet 1 of 6

The following schedules are provided as the preferred shift rotation schedules, but are not required.

(Note these will be color coded.)

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X					X	X	N	N	N	X	X	X
B	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X
C	D	X	T	T	T	T	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D
D	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N
E	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X

Five Shift 12-Hour Rotation (Training days are 8 hours)

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	x	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X
B	X	X	N	N	N	X	X	X	x	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X
C	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	x	D	D	D	D	X	X	T	T	T	T	X	D
D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	x	D	D	D	D	X	X	T	T	T	T	X	D
E	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	x	D	D	D	D	X

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	X	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	D	X	X	X	N	N	N
B	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	D	X	X	X	N	N	N	X	T	T	T	T	X	X
C	N	N	N	N	X	X	X	X	X	X	X	D	D	D	D	X	X	X	N	N	N	X	T	T	T	T	X	X	X	D	D	D	X	X	X
D	X	X	X	X	D	D	D	D	X	X	X	N	N	N	X	T	T	T	T	X	X	X	D	D	D	X	X	X	N	N	N	N	X	X	X
E	D	X	X	X	N	N	N	X	T	T	T	T	X	X	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	X
B	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X
C	X	X	X	N	N	N	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X
D	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N
E	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	D	D	D	D	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	X	D	D	D	X
B	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X
C	X	X	N	N	N	X	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	N	N	N	N	X	X	X	X	X
D	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	N	N
E	D	D	D	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D

Six Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X
B	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X
C	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N
D	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X
E	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X
F	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D

Six Shift 12-hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W
A	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X
B	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X
C	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D
D	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S
E	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T
F	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N

Optimum Six Shift 12 Hour Rotation (if remediation is needed, support crew follows training week)

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X
B	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N
C	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X
D	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X
E	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X
F	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D

Sheet 5 of 6

Six week 8 Hour Rotation

To be provided

Suggested Outage Schedule – if desired to work six 12 hour days / nights the following guidance should be used:

- Work 6 days, schedule 1 day off; work the next 6 days, schedule 2 days off. Continue this rotation throughout the outage.
- If a crew transition between nights and days or days and nights is planned also precede the transition with 2 days off. This will ensure the 72 hour in 7-day clock is reset.

Break requirements are: three 24 hour breaks every 15 days (non-rolling) and one 34-hour break every 9 days (rolling)

Two Super Crews (A and B) 35 day outage – 12 hour shift schedule. In this example only one crew is shown.
In this example the first week of night shift starts at 1900 on Monday and ends on Sunday morning at 0700

	15 days															15 days																				
	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	D	D	D	D	D	D	x	D	D	D	D	D	D	X	X	N	N	N	N	N	N	X	N	N	N	N	N	N	X	X	D	D	D	D	D
					34 hour break also counts as one 24 hour break Leave Friday at 1900 return on Sunday at 0700								3 - 24 hour breaks, also counts as 34 hour break Leave Friday at 1900 and return Monday at 1900								34 hour break also counts as one 24 hour break Leave Sunday at 0700 return Monday at 1900								2 – 24 hour breaks also counts as 34 hour break Leave at 0700 Sunday return at 0700 Tuesday				
B	N	N	N	N	N	N	X	N	N	N	N	N	N	X	X	D	D	D	D	D	D	X	D	D	D	D	D	D	X	X	N	N	N	N	N
					34 hour break also counts as one 24 hour break Leave Saturday at 0700 return Sunday at 1900								2 – 24 hour breaks also counts as 34 hour break Leave Saturday at 0700 return Monday at 0700								34 hour break also counts as one 24 hour break Leave Saturday at 1900 return on Monday at 0700								3 - 24 hour breaks, also counts as 36 hour break Leave Saturday at 1900 and return Tuesday at 1900				

Date: _____

Plant Site: _____

List the number of waivers issued for which work hour limit that was exceeded.

Group	Work Hour Limits during **Normal Operations**				
	>16 in 24 hours	>26 in 48 hours	> 72 in 7 days	< 10 hour break	< 34 hour break in any 9-day period
Operations					
Maintenance					
Chemistry					
HP					
Security					

Group	Work Hour Limits during **Normal Operations** (Minimum days off per week)		
	8-hour Shift Rotation Average < 1 day off per week	10-Hour Shift Rotation Average < 2 days off per week	12-hour Shift Rotation Average <2.5 days off per week
Operations			
Maintenance			
Chemistry			
HP			
Security			

Group	Work Hour Limits during **Outage Operations**					
	>16 in 24 hours	>26 in 48 hours	> 72 in 7 days	< 10 hour break	< 34 hour break in any 9-day period	< 3 days off in successive 15 day period
Operations						
Maintenance						
Chemistry						
HP						
Security						

List the number of individuals who received 1, 2 or 3, etc. waivers based on number of waivers issued

# Waivers Issued to an Individual	Operations	Maintenance	Chemistry	HP	Security
1					
2					
3					
4					
5					
6					
7					

Fatigue Assessments

Normal Operations - List the number of fatigue assessments for each group and each condition.

	Self-Declaration	For Cause	Post-Event	Followup
Operations				
Maintenance				
Chemistry				
HP				
Security				

Outage Operations - List the number of fatigue assessments for each group and each condition.

	Self-Declaration	For Cause	Post-Event	Followup
Operations				
Maintenance				
Chemistry				
HP				
Security				

If any management actions were taken as a result of any of the fatigue assessments performed, list the affected group, reason for the assessment and the action taken; number each item

_____
_____
_____
_____
_____

NOTE

Break – The time from which an individual leaves the protected area until the time the individual returns to the site. If weather or other conditions require the individual to remain at the protected area, the time for which the individual is not performing job duty functions and is resting.

Shift Turnover Time - time used to turnover those projects or support activities that require working two or more shifts. Shift turnover time is limited to the following:

A maximum of one hour at the beginning of each shift for turnover discussions.

A maximum of one hour at the end of each shift for turnover discussions.

Individual's Name (Multiple individuals may be listed but each individual SHALL be considered on an individual basis.)	Place check mark in the limit that will be exceeded (more than one limit may be exceeded)									
	>16 hours straight	>16 hours in any 24 hour period)	>24 hours in any 48 hour period	>72 hours in any 7 day period	<10 hour break between work periods	<36 hour (consecutive hours) break in previous 9 days	Average < one 24-hour break (consecutive hours) per week if working 8-hour shift	Average < two 24-hour breaks (consecutive hours) per week if working 10-hour shift	Average < three 24-hour breaks (consecutive hours) per week if working 12-hour shift	Outage only – less than 3 days off every 15 days (non-rolling)
	Does not include Shift Turnover Time				Includes Shift Turnover Time					

Unit Outage _____ Non-Outage _____ (check one)

[1] Evaluation of the need to exceed working hour limits. Consider the effectiveness of the individual as he/she is performing the task.

What job will he/she perform?

_____

_____

NOTE

Examples of adverse to safety conditions:

- Support for returning to service plant equipment required to support Technical Specification requirements or threats to sustained power generation.
- Unexpected absence of personnel requiring individuals to cover to ensure the Operations, Maintenance, Chemistry, Health Physics, or Fire Brigade (this does not include security personnel) required crew complement is maintained.

Why is the work activity considered "adverse to safety"?

_____

_____

_____

How does the work affect the plant? What are the adverse consequences of not repairing this equipment in an expedition manner?

_____

_____

_____

NOTE

When possible, equivalent resources should be utilized before requesting work hour deviations.

Why are other individuals not able to perform the job?

_____

_____

_____

What additional controls will be added, if any, to reduce the likelihood of error?

_____

_____

_____

[2] Will the individual be in compliance with the work hour limits when he/she returns to work on his/her next scheduled day of work? ? ☐ Yes ☐ No

If no, then a new authorization to waive the individual work hour, including a new fatigue assessment, has to be completed prior to allowing the individual to return to work.

NOTES

1. The requesting Supervisor's signature acknowledges the face to face fatigue assessment (Attachments 9.2 and 9.3) has been completed and is attached to the waiver.

2. Approval may be obtained per telecom provided the evaluation of the need for the individual to exceed the working hour limits is completed.

Requested by: _____ _____
(Supervisor) (Date)

Approved by: _____ _____
(Shift Operations Manager or designee) (Date)

Forward the completed form to the General Manager's office.

Check one or both of the following, if appropriate:

☐ Self Assessment of Fatigue being performed to obtain a waiver
☐ Self Declaration of Fatigue

[1] How many hours have you worked in the last 14 days? _____

[2] How many hours have you worked since your last break period? _____

[3] How long was the last break period away from work? _____

[4] If the last break period was less than 24 hours, how many consecutive days in a row have you worked since the last 24 hour break period? _____

[5] How many hours per day have you worked since your last 24 hour break period?
_____
_____

[6] Are you scheduled to perform risk significant work activities today? ☐ Yes ☐ No

[7] Describe the task you have been asked to perform:
_____
_____

[8] Do you feel you can perform the task without oversight (e.g., intermittent or constant supervision or peer reviews or independent reviews)? ☐ Yes ☐ No

[9] If you feel oversight is needed, what level of oversight do you feel is needed? (Otherwise, N/A)_____
_____

[10] Are you mentally alert? ☐ Yes ☐ No

[11] Are you physically capable of working the extended hours? ☐ Yes ☐ No

Comments:
_____
_____

Performed by: _____ Signature_____ Date _____
(Print Name)

Assessment of _____
(Employee's name)

Reason for the Fatigue Assessment:

☐ Issuance of Waiver (attach self assessment)
☐ For-cause (describe below in comments section)
☐ Self Declaration of Fatigue (attach self assessment)
☐ Post-Event (describe below in comments section)
☐ Follow-up (required when assessment was conducted for-cause or in response to self-declaration, when the employee returned to work with a rest break of less than 10 hours – describe in comments section.)

Comments: _____

_____

_____

Fatigue Assessment

[1] What type of work environment (e.g., temperature, humidity, confined space, etc) is or will the individual be working in?

_____

_____

[2] Is the individual mentally alert? ☐ Yes ☐ No

[3] Is the individual physically capable of working the extended hours? ☐ Yes ☐ No

[4] Are any precautions suggested to assist in managing the potential for fatigue related errors during the performance of the work activity (e.g., supervisory observation of work in progress, QC checks, or post maintenance tests)?

_____

_____

Restrictions based on Fatigue Assessment

☐ None, the individual may continue to work with no restrictions.

☐ The individual may continue to work but is limited to performing work activities that are NOT risk significant.

☐ The individual may continue current level of work with intermittent oversight as described above. (e.g., increased supervision, peer checks, or independent verifications)

☐ The individual may continue to work after a break period away from work of ____ hours.

Assessment Performed by _____ Date and Time _____

NOTE

If desired, an individual who disagrees with the fatigue assessment may initiate a grievance with the bargaining union, discuss the results with the employee concerns coordinator, or may initiate a condition report. The individual may also discuss his or her concerns with the NRC resident inspector or issue an allegation.

Individual's Acceptance or Non-Acceptance of the Fatigue Assessment

☐ I agree with the assessment. ☐ I disagree with the assessment.

Individual Being Assessed _____ Date and Time _____

_____
Date

A review is required to ensure excessive working hours are not assigned to [Utility] and contracted personnel who perform the job functions defined in the Section 5.3 of this procedure. Other groups may be evaluated if desired.

Table 1 provides a review of the individual limits and is required to be completed semiannually.

Table 2 provides a summary of fatigue assessments that were performed for reasons other than authorization of a waiver to exceed the individual work hour limits. Table 2 is required to be completed semiannually.

Review Criteria

1. Does each individual listed in Table 1 have an approved authorization and fatigue assessment? Yes No (Circle One)

2. **IF** no approved authorization exists or if no fatigue assessment exists or if neither exist for any individual listed in Table 1, **THEN** initiate a Condition Report (CR) and list the number in the Comments section below (otherwise N/A). _____ (Initials)

3. Attach the approved authorization forms and fatigue assessments for each individual listed in Table 1, unless otherwise noted in the comments section. _____ (Initials)

Comments:

_____

_____

Performed by: _____ Date: _____

4. Based on the review of Tables 1 and 2 does the staffing level for each group remain adequate? Yes No (Circle One)

Final Review: _____ Date: _____
(General Manager or Designee)

5. When Review is complete, forward to Records for retention (Records must be retained for 3 years). _____ (Initials)

Sheet 2 of 3

Check one: Departmental Review: _____ Site Review: _____

Table 1 – Semiannually Review
Individual Work Hour Limit Review
(Use additional pages as needed)

Individual's Name	Place check mark in the limit that was exceeded						
	Applicable at all times					Applicable when breakers are closed	Applicable when breakers are open
	> 16 hours in any 24 hour period	> 26 hours in any 48 hour period	> 72 hours in any 7 day period	< 10 hour break between work periods	< 34 hours off every rolling 9 days	<Average Days off during Shift Cycle	<3 days off every 15 days

Table 2 – Semiannually Review
Fatigue Assessment Review

This table includes a list of those individuals for which a fatigue assessment was performed for reasons other than the issuance of a waiver. If a waiver was issued the fatigue assessment was required. Additional pages may be used as needed.

Individual who was assessed	Check reason for assessment			
	Self Declaration	For Cause	Post Event	Follow-up
Total # of each type of assessment				

Sheet 1 of 6

The following schedules are provided as the preferred shift rotation schedules, but are not required.

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	N	N	N	X	X	X
B	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X
C	D	X	T	T	T	T	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D
D	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N
E	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X

Five Shift 12-Hour Rotation (Training days are 8 hours)

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	x	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X
B	X	X	N	N	N	X	X	X	x	D	D	D	D	X	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X
C	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	x	D	D	D	D	X	X	T	T	T	T	X	D
D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	x	D	D	D	D	X	X	T	T	T	T	X	D
E	X	T	T	T	T	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	x	D	D	D	D	X

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	X	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	D	X	X	X	N	N	N
B	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	D	X	X	X	N	N	N	X	T	T	T	T	X	X
C	N	N	N	N	X	X	X	X	X	X	X	D	D	D	D	X	X	X	N	N	N	X	T	T	T	T	X	X	X	D	D	D	X	X	X
D	X	X	X	X	D	D	D	D	X	X	X	N	N	N	X	T	T	T	T	X	X	X	D	D	D	X	X	X	N	N	N	N	X	X	X
E	D	X	X	X	N	N	N	X	T	T	T	T	X	X	X	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	X
B	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X
C	X	X	X	N	N	N	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X
D	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N
E	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D

Five Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	D	D	D	D	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	X	D	D	D	X
B	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X
C	X	X	N	N	N	X	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	N	N	N	N	X	X	X	X	X
D	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D	D	D	D	X	X	N	N
E	D	D	D	X	X	N	N	N	N	X	X	X	X	X	X	X	N	N	N	X	X	X	X	X	D	D	D	X	X	T	T	T	T	X	D

Six Shift 12-Hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X
B	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X
C	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N
D	X	S	S	S	S	X	X	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X
E	X	X	X	X	D	D	D	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X
F	D	X	X	N	N	N	X	X	T	T	T	T	X	X	X	D	D	D	X	X	N	N	N	N	X	X	X	X	X	S	S	S	S	X	X	X	X	X	X	D	D	D

Six Shift 12-hour Rotation

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N
B	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X
C	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X
D	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X
E	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X	X	S	S	S	S	S	X	X	T	T	T	T	X	D
F	X	S	S	S	S	S	X	X	T	T	T	T	X	D	D	D	D	X	X	X	N	N	N	N	X	X	X	X	X	X	X	D	D	D	X	X	X	X	N	N	N	X

Optimum Six Shift 12 Hour Rotation (if remediation is needed, support crew follows training week)

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X
B	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N
C	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X
D	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X
E	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D	D	X	T	T	T	T	X
F	D	X	T	T	T	T	X	X	S	S	S	S	S	X	X	N	N	N	X	X	X	X	D	D	D	X	X	X	X	X	X	X	N	N	N	N	X	X	X	D	D	D

Sheet 5 of 6

Six week 8 Hour Rotation

To be provided

Suggested Outage Schedule – if desired to work six 12 hour days / nights the following guidance should be used:

- Work 6 days, schedule 1 day off; work the next 6 days, schedule 2 days off. Continue this rotation throughout the outage.
- If a crew transition between nights and days or days and nights is planned also precede the transition with 2 days off. This will ensure the 72 hour in 7-day clock is reset.

Break requirements are: three 24 hour breaks every 15 days (non-rolling) and one 34-hour break every 9 days (rolling)

Two Super Crews (A and B) 35 day outage – 12 hour shift schedule. In this example only one crew is shown.
In this example the first week of night shift starts at 1900 on Monday and ends on Sunday morning at 0700

	15 days															15 days																				
	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
A	D	D	D	D	D	D	x	D	D	D	D	D	D	X	X	N	N	N	N	N	N	X	N	N	N	N	N	N	X	X	D	D	D	D	D
					34 hour break also counts as one 24 hour break Leave Friday at 1900 return on Sunday at 0700								3 - 24 hour breaks, also counts as 34 hour break Leave Friday at 1900 and return Monday at 1900							34 hour break also counts as one 24 hour break Leave Sunday at 0700 return Monday at 1900							2 – 24 hour breaks also counts as 34 hour break Leave at 0700 Sunday return at 0700 Tuesday				
B	N	N	N	N	N	N	X	N	N	N	N	N	N	X	X	D	D	D	D	D	D	X	D	D	D	D	D	D	X	X	N	N	N	N	N
					34 hour break also counts as one 24 hour break Leave Saturday at 0700 return Sunday at 1900								2 – 24 hour breaks also counts as 34 hour break Leave Saturday at 0700 return Monday at 0700							34 hour break also counts as one 24 hour break Leave Saturday at 1900 return on Monday at 0700							3 - 24 hour breaks, also counts as 36 hour break Leave Saturday at 1900 and return Tuesday at 1900				

APPENDIX F

Fatigue Management Training

To be provided

APPENDIX G

Standard Report Format
(See model procedure)

ANNUAL FFD PROGRAM PERFORMANCE REPORT

Sheet 1 of 2

Date: _____

Plant Site: _____

List the number of waivers issued for which work hour limit that was exceeded.

Group	Work Hour Limits during **Normal Operations**				
	>16 in 24 hours	>26 in 48 hours	> 72 in 7 days	< 10 hour break	< 34 hour break in any 9-day period
Operations					
Maintenance					
Chemistry					
HP					
Security					

Group	Work Hour Limits during **Normal Operations** (Minimum days off per week)		
	8-hour Shift Rotation Average < 1 day off per week	10-Hour Shift Rotation Average < 2 days off per week	12-hour Shift Rotation Average <2.5 days off per week
Operations			
Maintenance			
Chemistry			
HP			
Security			

Group	Work Hour Limits during **Outage Operations**					
	>16 in 24 hours	>26 in 48 hours	> 72 in 7 days	< 10 hour break	< 34 hour break in any 9-day period	< 3 days off in successive 15 day period
Operations						
Maintenance						
Chemistry						
HP						
Security						

List the number of individuals who received 1, 2 or 3, etc. waivers based on number of waivers issued

# Waivers Issued to an Individual	Operations	Maintenance	Chemistry	HP	Security
1					
2					
3					
4					
5					
6					
7					

Fatigue Assessments

Normal Operations - List the number of fatigue assessments for each group and each condition.

	Self-Declaration	For Cause	Post-Event	Followup
Operations				
Maintenance				
Chemistry				
HP				
Security				

Outage Operations - List the number of fatigue assessments for each group and each condition.

	Self-Declaration	For Cause	Post-Event	Followup
Operations				
Maintenance				

Chemistry				
HP				
Security				

If any management actions were taken as a result of any of the fatigue assessments performed, list the affected group, reason for the assessment and the action taken; number each item

_____
_____
_____
_____
_____