



REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 5.73

(New Regulatory Guide—Issued for Comment as DG-5026)

FATIGUE MANAGEMENT FOR NUCLEAR POWER PLANT PERSONNEL

A. INTRODUCTION

This guide describes a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for complying with the Commission's regulations for managing personnel fatigue at nuclear power plants.

The regulations promulgated by the NRC in Title 10, Part 26, "Fitness for Duty Programs," of the *Code of Federal Regulations* (10 CFR Part 26) (Ref. 1) establish requirements for ensuring that personnel are fit to safely and competently perform their duties. Subpart I, "Managing Fatigue," of 10 CFR Part 26 establishes requirements for managing personnel fatigue at nuclear power plants. The regulations in Subpart I provide a comprehensive and integrated approach to fatigue management, taking into account the multiple causes and effects of worker fatigue. The Commission recognizes that the potential for excessive fatigue is not solely based on extensive work hours but can result from other factors, such as stressful working conditions, sleep disorders, accumulation of sleep debt, and the disruptions of circadian rhythms associated with shift work. The requirements of Subpart I reflect these considerations to ensure that licensees effectively manage worker fatigue and provide reasonable assurance that workers are able to safely and competently perform their duties.

The requirements of Subpart I of 10 CFR Part 26 are organized in six sections as follows:

1. By means of reference to 10 CFR 26.3, "Scope," 10 CFR 26.201, "Applicability," requires that licensees authorized to operate a nuclear power reactor under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities" (Ref. 2), and certain holders of a combined license under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants" (Ref. 3), must implement the requirements of Subpart I before those licensees

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This guide was issued after consideration of comments received from the public.

Regulatory guides are issued in 10 broad divisions—1, Power Reactors; 2, Research and Test Reactors; 3, Fuels and Materials Facilities; 4, Environmental and Siting; 5, Materials and Plant Protection; 6, Products; 7, Transportation; 8, Occupational Health; 9, Antitrust and Financial Review; and 10, General.

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receive special nuclear material in the form of fuel assemblies. In addition, Subpart I requires certain combined license holders and applicants, as well as construction permit applicants and holders and certain early site permit holders, to comply with the requirements of Subpart I no later than the time of receipt of special nuclear material in the form of fuel assemblies.

Subpart I also applies to contractors/vendors who implement fitness-for-duty (FFD) programs or program elements to the extent that licensees and other entities who are subject to Subpart I rely on those contractors/vendors to meet the requirements of 10 CFR Part 26.

2. 10 CFR 26.203, “General Provisions,” establishes fatigue management requirements for licensees’ FFD programs. This section includes requirements for a fatigue management policy, procedures, training, recordkeeping, reporting, and auditing of the program.
3. 10 CFR 26.205, “Work Hours,” establishes controls on the work hours and rest-break periods of select categories of workers (referred to in this regulatory guide as “covered groups” or “covered workers”) who perform duties that directly affect safety and security (referred to as “covered work”). The provisions in this section address maximum work hours and minimum rest breaks for operating and outage conditions and increased threat conditions. This section incorporates, with limited modifications, work-hour guidelines in Generic Letter 82-12, “Nuclear Power Plant Staff Working Hours,” dated June 15, 1982 (Ref. 4), and includes additional requirements regarding minimum days off (MDO) and the calculation and review of work hours and rest-break periods.
4. 10 CFR 26.207, “Waivers and Exceptions,” specifies the conditions under which licensees are permitted to waive the work-hour and rest-break requirements in 10 CFR 26.205. The regulation also permits exceptions from the requirements of 10 CFR 26.205 under specified circumstances, such as force-on-force tactical exercises evaluated by the NRC and work hours necessary to protect the common defense and security or address plant emergencies.
5. 10 CFR 26.209, “Self-declarations,” establishes the requirements for licensee actions in response to an individual’s self-declaration of fatigue. All individuals who have unescorted access to protected areas in nuclear power plants, and are therefore subject to the requirements of 10 CFR Part 26, may self-declare if they believe they are not fit for duty because of fatigue. However, the requirements in 10 CFR 26.209 impose more stringent requirements on licensees for addressing self-declarations by workers who are performing or being assessed for work under a waiver of the requirements in 10 CFR 26.205.
6. 10 CFR 26.211, “Fatigue Assessments,” specifies the conditions under which licensees shall conduct fatigue assessments. It also includes specific provisions regarding the scope of the assessments and the associated documentation requirements placed on licensees.

This regulatory guide includes two appendices and a glossary. For convenience, Appendix A contains selected text of the Part 26 final rule, including the entire text of Subpart I. Appendix B contains the public comments received on “Draft Regulatory Guide DG-5026, Fatigue Management for Nuclear Power Plant Personnel” (Ref. 5) and the NRC staff’s responses to those comments. The glossary provides selected definitions of terms used in this regulatory guide.

This regulatory guide contains information collection requirements covered by 10 CFR Part 26 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0146. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number.

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B. DISCUSSION

1. Background

The Nuclear Energy Institute (NEI) submitted to the NRC a guidance document, NEI 06-11, Revision 1, “Managing Personnel Fatigue at Nuclear Power Reactor Sites,” issued October 2008 (Ref. 6), which provides information and describes methods applicable to implementing the requirements of Subpart I of 10 CFR Part 26. The guidance document describes the processes and procedures that licensees may use to manage personnel fatigue with an emphasis on procedures for implementing the work-hour and rest-break requirements of 10 CFR 26.205. The guidance presented in Revision 1 of NEI 06-11 is also intended to ensure the establishment of uniform fatigue management practices across the commercial nuclear power industry.

Through this regulatory guide, the NRC staff is endorsing, with certain clarifications, additions, and exceptions, Revision 1 of NEI 06-11. This regulatory guide includes clarifications and additions to NEI 06-11 and two substantive exceptions, as listed in Section C, “Regulatory Position.” One notable clarification pertains to the cross-references to NEI 03-04 (Revision 5, December 2008), “Guideline for Plant Access Training,” included in NEI 06-11. Because NEI 03-04 is not publicly available and the NRC staff has not reviewed the document, the staff has not determined that NEI 03-04 provides acceptable means for meeting the training requirements of 10 CFR Part 26. The bases for the other clarifications and additions to NEI 06-11 are the staff’s responses to the public comments received on “Draft Regulatory Guide DG-5026, Fatigue Management for Nuclear Power Plant Personnel” (Ref. 5), which are presented in Appendix B to this regulatory guide. For each regulatory position listed in Section C that describes an area of substantive disagreement with the guidance contained in NEI 06-11 or a clarification or addition to the guidance, a cross-reference to the relevant public comment and the staff’s response in Appendix B is provided.

The NRC staff identified two substantive issues related to guidance in NEI 06-11 for implementation of the work-hour controls established in Subpart I of 10 CFR Part 26. These issues concern the MDO requirements in 10 CFR 26.205(d)(3) through (d)(6). The MDO requirements ensure that individuals who perform certain duties have sufficient days off to mitigate the effects of cumulative fatigue. The concept of cumulative fatigue refers to the increase in an individual’s level of fatigue resulting from inadequate rest over consecutive sleep-wake periods. Cumulative fatigue can occur when an individual accumulates a sleep debt from the long periods of limited sleep associated with working multiple days of long shifts. Without the MDO provisions, licensees could require individuals who perform duties that directly affect safety and security to work sequential 72-hour weeks, allowing only 1 day off in every 9 days. The MDO requirements in 10 CFR 26.205(d)(3) through (d)(6) provide licensees with considerable flexibility in scheduling work and days off for covered individuals, while limiting the potential for cumulative fatigue.

The NRC staff’s exceptions to the MDO guidance in NEI 06-11 address (1) the applicability of the MDO requirements to occasional periods of increased work hours (i.e., NEI’s concept of “periodic overtime”), and (2) acceptable methods for implementing the MDO requirements described in 10 CFR 26.205(d)(4) during unit outages at multiunit facilities. Section C, “Regulatory Position,” of this regulatory guide outline the staff’s specific exceptions to NEI 06-11 associated with these issues. The Regulatory Positions also include guidance for meeting Part 26’s MDO requirements that the staff would find acceptable.

2. Periodic Overtime

The implementation guidance in Section 7.1, “Periodic Overtime,” of NEI 06-11 introduces the concept of “periodic overtime.” This concept is not included in Part 26, and is not necessary because the requirements of 10 CFR 26.205(d) allow flexibility for individuals to work more hours on some days and during some weeks than others to perform unscheduled work. As permitted by 10 CFR 26.205(d)(1), individuals may work as many as 16 hours in any 24-hour period, as many as 26 hours in any 48-hour period, and as many as 72 hours in any 7-day period.

The “periodic overtime” guidance in NEI 06-11 would permit licensees to establish a schedule for a shift duration (e.g., 8-hour shifts) that includes sufficient days off to meet the MDO requirements for that shift duration, but would allow licensees to assign or permit unscheduled work hours that could result in individuals working shift lengths (e.g., 10- or 12-hour shifts) that would require a greater number of days off under 10 CFR 26.205(d)(3). Although the guidance in Section 7.1 of NEI 06-11 describes a quarterly review process to address this concern, the NRC does not consider implementation of a quarterly review process as meeting the requirements of 10 CFR 26.205(d)(3). Specifically, the process would allow work hours for emergent work to be excluded from consideration in the determination of the MDO requirements. In addition, by allowing deviations from the MDO requirements to be controlled through quarterly reviews, the process would circumvent the waiver requirements in 10 CFR 26.207.

The NRC designed the MDO requirements in 10 CFR 26.205(d)(3) to minimize the potential for cumulative fatigue, while accommodating variations in workload that result from emergent work. For example, the MDO requirements for maintenance personnel on 8- and 10-hour shifts allow, on average, an extra day of work per week above a nominal 40-hour work week. The MDO requirements for maintenance personnel on 12-hour shifts allow, on average, an extra 1.5 workdays per week. In addition, Subpart I allows the MDO requirements to be met based on average daily work hours over a period of up to 6 weeks. As a result, licensees have the flexibility to distribute these extra workdays as necessary to accommodate emergent work. As discussed in the *Federal Register* notice for the final rule (Ref. 7), 10 CFR 26.205(d)(3) “accommodates a wide range of scheduling practices and short-term fluctuations in workload.” Because the requirements were intended to accommodate fluctuations in workload within limits that minimize the potential for cumulative fatigue, the NRC does not endorse the guidance in NEI 06-11 that would permit these limits to be exceeded through the exclusion of work hours for emergent work.

As stated in 10 CFR 26.205(d)(3), “licensees shall ensure that individuals have, at a minimum, the number of days off specified in this paragraph.” The NRC staff considers the appropriate means of deviating from this requirement to be the waiver process described in 10 CFR 26.207. The staff notes that Part 26 permits licensees to grant a waiver of the work-hour controls in 10 CFR 26.205(d)(1) through (d)(5)(i), including the MDO requirements of 10 CFR 26.205(d)(3). The waiver requirements in 10 CFR 26.207 are intended to ensure that deviations from the work-hour controls, including the MDO requirements, are limited to circumstances necessary to prevent or mitigate conditions adverse to safety or security. The process described in NEI 06-11 would circumvent the waiver requirements in 10 CFR 26.207 by allowing deviations from the MDO requirements to be controlled through quarterly reviews and by using criteria unrelated to safety or security.

Accordingly, the NRC does not endorse the guidance related to the concept of “periodic overtime” in NEI 06-11. Regulatory Positions 4, 5 and 6 in Section C, “Regulatory Position,” of this guide include methods that the staff would find acceptable for applying Subpart I’s MDO requirements for occasional periods of increased work hours.

3. Outages

The implementation guidance in Section 8.3, “Work Hour Controls During Outages, Security System Outages, or Increased Threat Conditions,” of NEI 06-11 under the heading, “Workers Not Eligible to Work Outage Hours,” would permit some licensed reactor operators and senior operators assigned to an operating unit at a multiunit site with one or more units in an outage to work on the operating unit under the relaxed work-hour limits applicable to individuals “while working on outage activities,” as described in 10 CFR 26.205(d)(4). The NRC staff believes that, at a minimum, those individuals composing the minimum shift complement of operators, including the operator at the controls and the senior operator in the control room, as specified in 10 CFR 50.54, “Conditions of Licenses” (Ref. 2) for the operating unit at a multiunit site, should not work the longer work hours that Subpart I permits for outages because these individuals’ primary duties are to ensure the safe operations of the operating unit.

The NRC staff’s position is based on the rules and guidance associated with the minimum crew complement, including the operator at the controls and the senior operator in the control room (i.e., 10 CFR 50.54(k) and 10 CFR 50.54(m)(2)(iii)). These individuals’ primary responsibility is to ensure that the unit is operating safely. They must be prepared to respond to and mitigate any operational problems. As described in “NRC’s Policy Statement on the Conduct of Nuclear Power Plant Operations,” dated January 24, 1989 (54 FR 3424) (Ref. 8), “the operator at the controls and the immediate supervisor must be continuously alert to plant conditions and ongoing activities affecting plant operations...” and “licensed operators must be alert and attentive to instruments and controls...using all their senses,...to prevent or mitigate any operational problems.” Further, Regulatory Guide 1.114, Revision 2, “Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit” (Ref. 9), states, “The operator must be alert to ensure that the unit is operating safely and must be capable of taking action to prevent any progress toward a condition that may be unsafe.”

The NRC staff also recognizes that the regulations, standard technical specifications, and licensees’ administrative procedures addressing control room staffing permit some flexibility. For example, except for the operator at the controls required by 10 CFR 50.54(k) and the senior operator in the control room required by 10 CFR 50.54(m)(2)(iii), licensed reactor operators and senior operators assigned to an operating unit often perform work at locations other than the licensee-designated control room area during a shift. As another example, Standard Technical Specification 5.2.2.b permits licensees to operate for short periods (not to exceed 2 hours) with a shift crew composition less than the minimum requirements established in 10 CFR 50.54 to accommodate unexpected absence of on-duty shift crew members, provided that immediate action is taken to restore the shift crew composition to within the minimum requirements. Consistent with this recognized need for flexibility, the NRC staff finds it acceptable for reactor and senior operators who make up the minimum shift complement on the operating unit to perform outage-related activities for the licensee in locations other than the control room, except for the operator at the controls required by 10 CFR 50.54(k) and the senior operator in the control room required by 10 CFR 50.54(m)(2)(iii). The staff also finds it acceptable for operators who have been working outage hours to provide short-term relief (not to exceed 2 hours) for the operator at the controls or the senior operator in the control room of an operating unit, if an appropriately qualified operator who has been working nonoutage hours is not immediately available or no other qualified operator is immediately available who has been working outage hours and has had 2 days off in the past 7-day period. If it is necessary for an operator who has not met the MDO requirements for the operating crew’s shift schedule to provide longer term relief (more than 2 hours) for the operator at the controls or the senior operator in the control room of an operating unit, licensees may permit an operator who has been working outage hours to provide longer term relief under a waiver, as described in 10 CFR 26.207.

Accordingly, the NRC does not endorse the guidance in Section 8.3 of NEI 06-11 under the heading, “Workers Not Eligible to Work Outage Hours.” Regulatory Position 11 in Section C, “Regulatory Position,” of this guide describes methods that the staff would find acceptable for implementing the MDO requirements contained in 10 CFR 26.205(d)(4) during unit outages at multiunit facilities.

C. REGULATORY POSITION

The NRC staff considers conformance with the guidance in Revision 1 of NEI 06-11 to be an acceptable approach to meeting the requirements of 10 CFR Part 26 related to managing fatigue at nuclear power plants, subject to the following clarifications, additions, and exceptions:

1. The second sentence of the first paragraph of Section 1, “Introduction,” of NEI 06-11 refers to NEI 03-04, “Guideline for Plant Access Training,” as does the first paragraph in Section 12.1, “Conditions for Conducting Fatigue Assessments.” Section 14, “Training and Examination,” also references NEI 03-04 in several places. Because it has not reviewed NEI 03-04, the staff has not determined that NEI 03-04 provides an acceptable means for meeting the training requirements of 10 CFR Part 26.

(See also comment 9 in Appendix B to this guide.)

2. In Section 6.2, “Work Hour Controls for Covered Individuals,” after the lead-in which states, “Work hour controls do not apply to the following individuals and activities,” replace the third bullet with the following text:

Predictive maintenance activities that do not result in a change of condition or state of a structure, system, or component (SSC) that a risk-informed evaluation process has shown to be significant to public health and safety may be excluded from covered maintenance activities. Examples of activities that may be excluded if they do not change the state or condition of these SSCs include, but are not limited to, nondestructive examination (NDE), thermography, vibration analysis, and data collection and analysis.

(See also comments 1 and 12 in Appendix B to this guide.)

3. Replace the last bullet in Section 6.2 with the following text:

Emergency Response Personnel who do not perform health physics or chemistry duties required as a member of the onsite emergency response organization minimum shift complement.

(This clarification has been added to distinguish the emergency response organization minimum shift complement from the minimum shift complement of operators discussed in comment 6 of Appendix B to this guide.)

4. In Section 7, “Work Hours Scheduling,” replace the last paragraph that precedes Section 7.1, “Periodic Overtime,” with the following:

Staffing levels should be sufficient so that schedules for the covered individuals can be maintained based on vacation and training demand without relying on waivers. It is expected and allowed that normal variation in vacation and training demands may occasionally require additional work hours to be used. Management is responsible for understanding the total vacation, training, and workload demands, and for maintaining sufficient staff to do the work.

(See also comments 2 and 21 in Appendix B to this guide.)

5. Rename Section 7.1, “Periodic Overtime,” as “Unscheduled Work Hours and Minimum Days Off.” Replace the text in Section 7.1 with the following:

Periodically, workers and supervisors may need to work unscheduled hours to meet station needs. These unscheduled hours will be worked while meeting all work hour rules, for both time at work, break requirements, and minimum days off (MDO), consistent with the individual's shift schedule. An accumulation of unscheduled work hours over a shift cycle may affect the MDO requirement that applies to individuals or crews.

An individual’s actual hours worked determine which MDO requirement is applicable, as follows: Over a shift cycle, individuals who average not more than 9 hours per workday are subject to the MDO requirement applicable to an 8-hour shift. Over a shift cycle, individuals who average more than 9 hours per workday and not more than 11 hours per workday, are subject to the MDO requirement applicable to a 10-hour shift. Over a shift cycle, individuals who average more than 11 hours per workday shall meet the MDO requirement applicable to a 12-hour shift.

Because the applicable MDO requirement is based on the average hours an individual works per day over a shift cycle, the MDO requirements allow the flexibility for individuals to work more hours on some days and during some weeks than others. As permitted by 10 CFR 26.205(d)(1), individuals may work as many as 16 hours in any 24-hour period, as many as 26 hours in any 48-hour period, and as many as 72 hours in any 7-day period. In addition, the following guidance applies:

- Over a shift cycle, a covered individual may work an average of as many as 9 hours per workday if he or she has, on average, a minimum of 1 day off per week.
- Over a shift cycle, a covered individual may work an average of as many as 11 hours per workday if he or she has, on average, a minimum of 2 days off per week.
- Over a shift cycle, an individual who is performing the operations, health physics, chemistry, or fire brigade duties described in 10 CFR 26.4(a)(1) through (a)(3) may work an

average of as many as 13 hours per workday if he or she has, on average, a minimum of 2.5 days off per week.

- Over a shift cycle, an individual who is performing the maintenance duties described in 10 CFR 26.4(a)(4) may work an average of as many as 13 hours per workday if he or she has, on average, a minimum of 2 days off per week.
- Over a shift cycle, an individual who is performing the security duties described in 10 CFR 26.4(a)(5) may work an average of as many as 13 hours per workday if the individual has, on average, a minimum of 3 days off per week.

(See also comment 2 in Appendix B of this guide.)

6. Replace the text in Section 7.2, “Transitions Between Schedules,” with the following:

Licensees may change individuals’ work hours during the shift cycle. The following guidance applies: For work-hour transitions, licensees should calculate the average duration of the shifts worked and to be worked during a period of not more than 6 weeks, which encompasses the schedule transition, to determine the applicable MDO requirement. If the average hours worked per shift is not more than 9 hours, then the MDO requirement for an 8-hour shift schedule applies. If the average hours worked per shift is more than 9 hours but not more than 11 hours, then the MDO requirement for a 10-hour shift applies. If the average hours worked per shift is more than 11 hours, then the MDO requirement for a 12-hour shift applies.

Licensees may transition individuals or crews between shift schedules by ending a shift cycle and starting a new shift cycle with a different shift schedule. The following guidance applies: For shift cycles that the licensee terminates, the licensee should ensure that the individuals met the MDO requirement applicable to the shift schedule that the individuals were working before it was terminated. In these instances, for the purpose of determining compliance with the MDO requirements, the licensee may average the individuals’ work hours over a period immediately preceding the transition that is equal in length to the shift cycle the individuals were working before the transition (e.g., 6 weeks, if the shift cycle was 6 weeks in length). The licensee should then ensure that the individual meets the applicable MDO requirement for the new shift schedule going forward from the beginning of the new shift cycle. A shift cycle may be as short as 1 week.

(See also comment 2 in Appendix B to this guide.)

7. In Section 7.3, “Transitioning Onto a Shift or Between Covered Groups or Into a Covered Group,” replace the last bullet before the examples with the following:

- A minimum of 2 days off in the preceding 7-day period is acceptable for operators at a multiunit site with one or more units

in an outage, if the operators have been working outage hours on 10- or 12-hour shifts before they transition to an operating unit as members of the minimum shift complement described in Section 8.3.

(See also comment 4 in Appendix B to this guide.)

8. In Section 8.1, “Calculating Hours Worked,” under the heading, “Shift Turnover,” replace the sentence that states, “Turnover may include time necessary to prepare for specific job requirements for example arming and disarming times for security guards or donning or un-donning of protective clothing for radiation workers as necessary to support turnover,” with the following:

Turnover may include the time required for security personnel to arm and disarm.

(See also comment 8 in Appendix B to this guide.)

9. In Section 8.1, in the second paragraph under the heading, “Incidental duties performed off site,” revise the first sentence to read:

After-hours study time that is not required by the licensee may be excluded from work-hour calculations.

(See also comment 22 in Appendix B to this guide.)

10. In Section 8.3, “Work Hour Controls During Outages, Security System Outages, or Increased Threat Conditions,” under the heading, “Transitioning Into/Out of an Outage, Security System Outages, or Increased Threat Conditions,” replace the last paragraph with the following:

Licensee employees and contractor/vendor personnel may go from an outage at one site to an outage at another site. When a licensee employee or contractor/vendor performs covered work for a licensee during two or more unit outages or security system outages (or a combination thereof), and the interval(s) between successive outages is less than 9 days, the receiving licensee should determine that the individual has had a 34-hour break period within the 9 days that precede the day on which the individual begins working for the receiving licensee. In addition, when the individual begins work for the receiving licensee, the licensee should ensure that individual’s hours worked did not and will not exceed the following limits:

1. 16 work hours in any 24-hour period
2. 26 work hours in any 48-hour period
3. 72 work hours in any 7-day period

(See also comment 11 in Appendix B to this guide.)

11. In Section 8.3, under the heading, “Workers Not Eligible to Work Outage Hours,” revise the guidance as follows:

Replace the first bulleted paragraph with the following three paragraphs and table:

At a multiunit site when one or more units is in an outage, those licensed operators composing the minimum shift complement of operators required under 10 CFR 50.54(m) for the operating unit, including the operator at the controls specified in 10 CFR 50.54(k) and the senior operator in the control room required under 10 CFR 50.54(m)(2)(iii), are not eligible for the MDO requirements permitted by 10 CFR 26.205(d)(4). However, nothing in Subpart I of 10 CFR Part 26 prohibits these individuals from performing outage activities.

An operator who has been working outage work hours and has had 2 days off in the previous 7-day period may provide relief to the operator at the controls or the senior operator in the control room, if an appropriately qualified operator who has been working nonoutage work hours is not immediately available to provide relief. If an operator who has been working outage work hours and has had 2 days off in the previous 7-day period is not immediately available, an operator who has been working outage hours may provide (1) short-term relief (up to 2 hours) for the operator at the controls or the senior operator in the control room without a waiver or (2) longer term relief (more than 2 hours) under a waiver of the MDO requirement that is applicable to the shift schedule (i.e., 8-, 10-, or 12-hour shifts) for personnel assigned to the operating unit.

The following table details the number of reactor operators and senior operators who should have the operating reactor as their primary responsibility and should not be permitted to work outage hours. Consistent with 10 CFR 50.54(m), the numbers in the table differ according to the design of the control rooms at a multiunit site where one or more unit is in an outage.

Minimum Number of Individuals Per Shift Working Nonoutage Schedules for Onsite Staffing of Operating Nuclear Power Units during Outages								
Number of operating nuclear power units ¹	Position	Two-unit site		Three-unit site				
		One Control Room	Two Control Rooms	Two control rooms				Three Control Rooms
				Single Control Room Unit in Outage	Single Control Room Unit and One Unit Served by Dual Control Room in Outage	One of the Two Units Served by Dual Control Room in Outage	Two Units Served by Dual Control Room in Outage	
One	Senior Operator	2	2		2		2	2
	Operator	2	2		2		2	2
Two	Senior Operator			2		3		3
	Operator			3		4		4

¹ For the purpose of this table, a nuclear power unit is considered to be operating when it is connected to the grid.

After the sentence that states, “Following are examples of Covered Workers that may be affected by outage work hour limitations,” revise examples 1, 4 and 9 as follows:

Example 1—A maintenance or operations worker at a multiunit site who has responsibilities for outage activities, except if the operations worker is a member of the minimum shift complement for an operating unit, as described in this section. The maintenance worker and the operations worker who is not a member of the minimum shift complement for an operating unit, as described in this section, are eligible for outage work-hour limitations.

Example 4—An operator at a multiunit site with responsibilities for activities on the operating unit, outage unit, and common systems, who is not a member of the minimum shift complement for an operating unit, as described in this section. This operator is eligible for outage work-hour limitations.

Example 9—An operator at a multiunit site who is performing activities on the outage unit and is following outage work-hour requirements who is assigned to activities on an operating unit, except if the operator is a member of the minimum shift complement for an operating unit, as described in this section. The operator who is on outage work-hour limitations should not provide relief to the operator at the controls or the senior operator in the control room for an operating unit, unless another operator who has been on nonoutage work hours is not immediately available and the operator has had 2 days off in the preceding 7-day period. If the operator has not had 2 days off in the preceding 7-day period and no other operator who has had 2 days off is immediately available, the operator may provide short-term relief (up to 2 hours) to the operator at the controls or the senior operator in the control room for

an operating unit or long-term relief (more than 2 hours) under a waiver of the MDO requirement that is applicable to the shift schedule (i.e., 8-, 10-, or 12-hour shifts) for personnel assigned to the operating unit.

(See also comments 6 and 36 in Appendix B to this guide.)

12. In Section 9, “Waivers,” in numbered item 3 titled “Supervisory assessment,” replace the first bullet in the list with the following:

- Work history for the past 14 days as reported by the individual for whom the waiver is requested and, if the individual has worked for a licensee who is subject to Subpart I of Part 26 over the past 14 days, as documented by that licensee.

(See also comment 25 in Appendix B to this guide.)

13. In Section 9, under the heading “Granting Waivers,” replace the phrase “qualified to oversee the work” with the phrase “qualified to direct the work” in the second sentence of numbered item 2. Replace “qualified to oversee” with “qualified to direct” in the first sentence of numbered item 3.

(See also comment 26 in Appendix B to this guide.)

14. Replace numbered paragraphs 1 and 2 of Section 15, “Reviews,” with the following paragraph and renumber the subsequent paragraphs accordingly:

1. Review the actual work hours and performance of covered individuals during the entire review period, including any plant or security system outages or increased threat conditions, for consistency with the work-hours scheduling requirement objective of preventing impairment from fatigue due to the duration, frequency, and sequencing of hours worked. The review should be based on information in, but not limited to, the corrective action program. At a minimum, this review should address the following:
 - a. 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 were subject to the nonoutage day-off requirements.
 - b. Individuals who were granted more than one waiver during the review period.
 - c. Individuals who were assessed for fatigue during the review period.

(See also comment 7 in Appendix B.)

15. The examples included throughout NEI 06-11 to supplement the guidance may not apply to all circumstances for all licensees or other entities subject to Subpart I of 10 CFR Part 26. A licensee or other entity should ensure that an example is applicable to its particular circumstances

and is consistent with the requirements of the rule before implementing the guidance in an example.

Use of Other Methods

Licensees and other entities subject to Subpart I of 10 CFR Part 26 may use methods other than those described in NEI 06-11, as clarified by this regulatory guide, to meet the requirements of the regulations in 10 CFR Part 26. The NRC will determine the acceptability of other methods on a case-by-case basis. Methods and solutions that differ from those set forth in this regulatory guide may be deemed acceptable if they are accompanied by a sufficient basis for the findings required for issuance or continuance of a permit or license by the Commission.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance.

In some cases, applicants or licensees may propose or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for license applications, license amendment applications, and amendment requests.

GLOSSARY

Circadian Rhythm	The variation in human physiological processes that repeat on an approximate 24-hour cycle.
Cumulative Fatigue	The increase in fatigue over consecutive sleep-wake periods resulting from inadequate rest.
Fatigue	The degradation in an individual's cognitive and motor functioning resulting from inadequate rest.
Maintenance	For the purposes of 10 CFR 26.4(a)(4), maintenance includes the following onsite activities: modification, surveillance, postmaintenance testing, and corrective and preventive maintenance.
Sleep Debt	The difference between the amount of sleep an individual needs and the amount of sleep that the individual actually obtains.

REFERENCES

1. 10 CFR Part 26, "Fitness for Duty Programs," U.S. Nuclear Regulatory Commission, Washington, DC.
2. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," U.S. Nuclear Regulatory Commission, Washington, DC.
3. 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," U.S. Nuclear Regulatory Commission, Washington, DC.
4. GL 82-12, "Nuclear Power Plant Staff Working Hours," U.S. Nuclear Regulatory Commission, Washington, DC, June 15, 1982.
5. 73 FR 56618, "Draft Regulatory Guide DG-5026, Fatigue Management for Nuclear Power Plant Personnel," *Federal Register*, Volume 73, p. 56618, September 29, 2008.
6. NEI 06-11, Revision 1, "Managing Personnel Fatigue at Nuclear Power Reactor Sites," Nuclear Energy Institute, Washington, DC, October 2008. (ADAMS Accession No. ML083110161)
7. 73 FR 16988, "10 CFR Part 26, Fitness for Duty Programs, Final Rule," *Federal Register*, Volume 73, p. 16988, March 31, 2008.
8. 54 FR 3424, "NRC's Policy Statement on the Conduct of Nuclear Power Plant Operations," *Federal Register*, Volume 54, p. 3424, January 24, 1989.
9. Regulatory Guide 1.114, "Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Unit," U.S. Nuclear Regulatory Commission, Washington, DC.

APPENDIX A

SELECTED TEXT OF 10 CFR PART 26

§ 26.3 Scope

- (a) Licensees who are authorized to operate a nuclear power reactor under 10 CFR 50.57, and holders of a combined license under 10 CFR Part 52 after the Commission has made the finding under 10 CFR 52.103(g) shall comply with the requirements of this part, except for subpart K of this part. Licensees ... shall implement the FFD program before the receipt of special nuclear material in the form of fuel assemblies.
- (d) Contractor/vendors (C/Vs) who implement FFD programs or program elements, to the extent that the licensees and other entities specified in paragraphs (a) through (c) of this section rely on those C/V FFD programs or program elements to meet the requirements of this part, shall comply with the requirements of this part.

§ 26.4 FFD program applicability to categories of individuals

- (a) All persons who are granted unescorted access to nuclear power reactor protected areas by the licensees in § 26.3(a) and, as applicable, (c) and perform the following duties shall be subject to an FFD program that meets all of the requirements of this part, except subpart K of this part:
 - (1) Operating or onsite directing of the operation of systems and components that a risk-informed evaluation process has shown to be significant to public health and safety;
 - (2) Performing health physics or chemistry duties required as a member of the onsite emergency response organization minimum shift complement;
 - (3) Performing the duties of a fire brigade member who is responsible for understanding the effects of fire and fire suppressants on safe shutdown capability;
 - (4) Performing maintenance or onsite directing of the maintenance of SSCs that a risk-informed evaluation process has shown to be significant to public health and safety; and
 - (5) Performing security duties as an armed security force officer, alarm station operator, response team leader, or watchperson, hereinafter referred to as security personnel.
- (b) All persons who are granted unescorted access to nuclear power reactor protected areas by the licensees in § 26.3(a) and, as applicable, (c) and who do not perform the duties described in paragraph (a) of this section shall be subject to an FFD program that meets all of the requirements of this part, except §§ 26.205 through 26.209 and subpart K of this part.
- (c) All persons who are required by a licensee in § 26.3(a) and, as applicable (c) to physically report to the licensee's Technical Support Center or Emergency Operations Facility by licensee emergency plans and procedures shall be subject to an FFD program that meets all of the requirement of this part, except §§ 26.205 through 26.209 and subpart K of this part.

Subpart I—Managing Fatigue

§ 26.201 Applicability

The requirements in this subpart apply to the licensees and other entities identified in § 26.3(a), and, if applicable, (c) and (d). The requirements in §§ 26.203 and 26.211 apply to the individuals identified in § 26.4(a) through (c). In addition, the requirements in § 26.205 through § 26.209 apply to the individuals identified in § 26.4(a).

§ 26.203 General provisions

- (a) *Policy.* Licensees shall establish a policy for the management of fatigue for all individuals who are subject to the licensee’s FFD program and incorporate it into the written policy required in § 26.27(b).
- (b) *Procedures.* In addition to the procedures required in § 26.27(c), licensees shall develop, implement, and maintain procedures that—
- (1) Describe the process to be followed when any individual identified in § 26.4(a) through (c) 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 must—
 - (i) Describe the individual’s and licensee’s rights and responsibilities related to self-declaration;
 - (ii) 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; and
 - (iii) Describe the process to be followed if the individual disagrees with the results of a fatigue assessment that is required under § 26.211(a)(2);
 - (2) Describe the process for implementing the controls required under § 26.205 for the individuals who are performing the duties listed in § 26.4(a);
 - (3) Describe the process to be followed in conducting fatigue assessments under § 26.211; and
 - (4) Describe the disciplinary actions that the licensee may impose on an individual following a fatigue assessment, and the conditions and considerations for taking those disciplinary actions.
- (c) *Training and examinations.* 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.

- (d) *Recordkeeping.* 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 in § 26.205;
 - (2) Records of shift schedules and shift cycles of individuals who are subject to the work hour controls in § 26.205;
 - (3) The documentation of waivers that is required in § 26.207(a)(4), including the bases for granting the waivers;
 - (4) The documentation of work hour reviews that is required in § 26.205(e)(3) and (e)(4); and
 - (5) The documentation of fatigue assessments that is required in § 26.211(g).
- (e) *Reporting.* 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 when the licensee waived the work hour controls specified in § 26.205(d)(1) through (d)(5)(i) for individuals described in § 26.4(a). The summary must 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 must 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 when each applicable 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)(v) was waived for individuals not working on outage activities;
 - (ii) The number of instances when each applicable 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)(v), and (d)(4) and (d)(5)(i) 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 who received only one waiver during the reporting period, the number of individuals who received a total of two waivers during the reporting period).
 - (2) A summary of corrective actions, if any, resulting from the analyses of these data, including fatigue assessments.
- (f) *Audits.* Licensees shall audit the management of worker fatigue as required by § 26.41.

§ 26.205 Work hours

- (a) *Individuals subject to work hour controls.* Any individual who performs duties identified in § 26.4(a)(1) through (a)(5) shall be subject to the requirements of this section.
- (b) *Calculating work hours.* For the purposes of this section, a licensee shall calculate the work hours of individuals who are subject to this section as the amount of time the individuals perform duties for the licensee. Except as permitted by paragraphs (b)(1) through (b)(5) of this section, 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.
- (1) *Shift turnover.* Licensees may exclude 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.
 - (2) *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).
 - (3) *Beginning or resuming duties subject to work hour controls.* If an individual begins or resumes performing for the licensee any of the duties listed in § 26.4(a) during the calculation period, the licensee shall include in the calculation of the individual's work hours all work hours worked for the licensee, including hours worked performing duties that are not listed in § 26.4(a), and control the individual's work hours under the requirements of paragraph (d) of this section.
 - (4) *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.
 - (5) *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 does not exceed a nominal 30 minutes during any single break period. For the purposes of compliance with the minimum break requirements of paragraph (d)(2) of this section and the minimum day off requirements of paragraph (d)(3) through (d)(5) of this section, such duties do not constitute work periods or work shifts.
- (c) *Work hours scheduling.* Licensees shall schedule the work hours of individuals who are subject to this section consistent with the objective of preventing impairment from fatigue due to the duration, frequency, or sequencing of successive shifts.

- (d) *Work hour controls.* Licensees shall control the work hours of individuals who are subject to this section.
- (1) Except as permitted in § 26.207, 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 in this paragraph. For the purposes of this subpart, 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 in § 26.207, 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; and
 - (ii) A 34-hour break in any 9-day period.
 - (3) Licensees shall ensure that individuals have, at a minimum, the number of days off specified in this paragraph. For the purposes of this subpart, a day off is defined as a calendar day during which an individual does not start a work shift. For the purposes of calculating the average number of days off required in this paragraph, 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 2 days off per week, averaged over the shift cycle;
 - (iii) Individuals who are working 12-hour shift schedules while performing the duties described in § 26.4(a)(1) through (a)(3) shall have at least 2.5 days off per week, averaged over the shift cycle;
 - (iv) Individuals who are working 12-hour shift schedules while performing the duties described in § 26.4(a)(4) shall have at least 2 days off per week, averaged over the shift cycle; and
 - (v) Individuals who are working 12-hour shift schedules while performing the duties described in § 26.4(a)(5) 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 paragraph (d)(3) of this section for individuals specified in § 26.4(a)(1) through (a)(4), while those individuals are working on outage activities. However, the licensee shall ensure that the individuals specified in § 26.4(a)(1) through (a)(3) have at least 3 days off in each successive (i.e., non-rolling) 15-day period and that the individuals specified in § 26.4(a)(4) have at least 1 day off in any 7-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 individuals specified in § 26.4(a)(5) as follows:
 - (i) During the first 60 days of a unit outage or a planned security system outage, licensees need not meet the requirements of paragraph (d)(3) of this section. However, licensees shall ensure that these individuals have at least 4 days off in each successive (i.e., non-rolling) 15-day period; and
 - (ii) During the first 60 days of an unplanned security system outage or increased threat condition, licensees need not meet the requirements of either paragraph (d)(3) or (d)(5)(i) of this section.
- (6) The 60-day periods in paragraphs (d)(4) and (d)(5) of this section may be extended for each individual in 7-day increments for each non-overlapping 7-day period the individual has worked not more than 48 hours during the unit or security system outage or increased threat condition, as applicable.
- (e) *Reviews.* Licensees shall evaluate the effectiveness of their control of work hours of individuals who are subject to this section. Licensees shall conduct the reviews once per 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 individuals who are subject to this section for consistency with the requirements of § 26.205(c). 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 requirements of § 26.205(d)(3);
 - (ii) Individuals who were granted more than one waiver during the review period; and
 - (iii) Individuals who were assessed for fatigue under § 26.211 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 the review and the results of the review; 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.

§ 26.207 Waivers and exceptions

(a) *Waivers.* Licensees may grant a waiver of the work hour controls in § 26.205(d)(1) through (d)(5)(i), as follows:

- (1) To grant a waiver, the licensee shall meet both of the following requirements:
 - (i) 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
 - (ii) 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 as required by §§ 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.
 - (2) To the extent practicable, licensees shall rely on the granting of waivers only to address circumstances that could not have been reasonably controlled;
 - (3) Licensees shall ensure that the timing of the face-to-face supervisory assessment that is required by paragraph (a)(1)(ii) of this section 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 4 hours before the individual begins performing any work under the waiver; and
 - (4) 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 determinations required in paragraphs (a)(1)(i) and (ii) of this section.
- (b) *Force-on-force tactical exercises.* For the purposes of compliance with the minimum days off requirements of § 26.205(d)(3), licensees may exclude shifts worked by security personnel during the actual conduct of NRC-evaluated force-on-force tactical exercises when calculating the individual's number of days off.

- (c) *Common defense and security.* When informed in writing by the NRC that the requirements of § 26.205, or any subset thereof, are waived for security personnel to ensure the common defense and security, licensees need not meet the specified requirements of § 26.205 for the duration of the period defined by the NRC.
- (d) *Plant emergencies.* Licensees need not meet the requirements of § 26.205(c) and (d) during declared emergencies, as defined in the licensee's emergency plan.

§ 26.209 Self-declarations

- (a) If an individual is performing, or being assessed for, work under a waiver of the requirements contained in § 26.205(d)(1) through (d)(5)(i) 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 duties listed in § 26.4(a), except if the individual is required to continue performing those duties under other requirements of this chapter. If the subject individual must continue performing the duties listed in § 26.4(a) until relieved, the licensee shall immediately take action to relieve the individual.
- (b) Following a self-declaration, as described in paragraph (a) of this section, the licensee—
 - (1) May reassign the individual to duties other than those listed in § 26.4(a), but only if the results of a fatigue assessment, conducted under the requirements of § 26.211, 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 duties listed in § 26.4(a).

§ 26.211 Fatigue assessments

- (a) Licensees shall ensure that fatigue assessments are conducted under the following conditions:
 - (1) For cause. In addition to any other test or determination of fitness that may be required under §§ 26.31(c) and 26.77, 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 rest 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 as specified in § 26.31(c). 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.

- (b) Only supervisors and FFD program personnel who are trained under §§ 26.29 and 26.203(c) may conduct a fatigue assessment. The fatigue assessment must be conducted 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 specified in § 26.205(d)(1) through (d)(5)(i) 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 factors listed in paragraph (c)(1) of this section. Licensees shall limit any inquiries to obtaining from the subject individual only the personal information that may be necessary to assess the factors listed in paragraph (c)(1) of this section.
- (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 limits specified in § 26.205(d)(1) or that the individual has had the minimum breaks required in § 26.205(d)(2) or minimum days off required in § 26.205(d)(3) through (d)(5), 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.
- (g) Licensees shall also prepare an annual 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). Each summary must include—
 - (1) The conditions under which each fatigue assessment was conducted (i.e., self-declaration, for cause, post-event, followup);
 - (2) 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;
 - (3) 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
 - (4) The management actions, if any, resulting from each fatigue assessment.

APPENDIX B

Response to Public Comments on Draft Regulatory Guide DG-5026, “Fatigue Management for Nuclear Power Plant Personnel” New Regulatory Guide 5.73

The U.S. Nuclear Regulatory Commission (NRC) published a notice in the *Federal Register* (73 FR 56618) on September 29, 2008, that Draft Regulatory Guide (DG)-5026 (proposed new Regulatory Guide 5.73) was available for public comment. The public comment period ended on October 31, 2008. Fourteen organizations submitted comments, which are available in the NRC’s Agencywide Documents Access and Management System (ADAMS). The NRC has combined the comments, and the following table summarizes the NRC staff’s disposition of them.

Comments were received from the following individuals and organizations:

<p>Douglas J. Walters, Senior Director Nuclear Energy Institute (NEI) 1776 I Street, N.W., Suite 400 Washington, DC 20006-3708 ADAMS Accession No. ML083110161 and ADAMS Accession No. ML090080138</p>	<p>NEI comments also endorsed by: Entergy Nuclear Operations, Inc. ADAMS Accession No. ML083100592 Public Service Electric & Gas Co. ADAMS Accession No. ML083100591</p>	<p>Donna Alexander, Nuclear Regulatory Affairs Progress Energy 411 Fayetteville Street Mall P.O. Box 1551 Raleigh, NC 27602 ADAMS Accession No. ML083100594</p>
<p>NEI comments endorsed by: Southern Nuclear Operating Co. ADAMS Accession No. ML083050619 Northern States Power Co. (Xcel Energy) ADAMS Accession No. ML083050184 Dominion Resources Services, Inc. ADAMS Accession No. ML083220199</p>	<p>Florida Power & Light ADAMS Accession No. ML083100589 Strategic Teaming and Resources Sharing (STARS) ADAMS Accession No. ML083190386</p>	<p>C.L. Funderburk Dominion Resources Services, Inc. 500 Dominion Boulevard Glen Allen, VA 23060 ADAMS Accession No. ML083220199 David Lochbaum, Director Nuclear Safety Project Union of Concerned Scientists 1825 K Street, N.W., Suite 800 Washington, DC 20006 ADAMS Accession No. ML090080163</p>
<p>Edwin D. Hill, International President International Brotherhood of Electrical Workers (IBEW) 900 Seventh Street, N.W. Washington, DC 20001 ADAMS Accession No. ML082960428</p>	<p>Mark H. Ayers, President Building and Construction Trades Dept., AFL-CIO 815 16th Street, N.W., Suite 600 Washington, DC 20006 ADAMS Accession No. ML083100595</p>	<p>AFL-CIO comment letter cosigned by: Iz Cakrane, President Associated Maintenance Contractors 510 Carnegie Center Princeton, NJ 08540 ADAMS Accession No. ML083100595</p>

Comment from	Comment	NRC Staff Disposition
<p data-bbox="277 1318 310 1900">Nuclear Energy Institute (NEI) Comments</p> <p data-bbox="329 1711 459 1837">1 NEI and supporters, Progress Energy</p>	<p data-bbox="329 1094 391 1690"><u>Regulatory Position 1—Definition of Predictive Maintenance</u></p> <p data-bbox="431 947 695 1690">In DG-5026, the staff proposed revising NEI 06-11, Revision E, Section 6.2, to read as follows, ‘Predictive maintenance activities that are not required by technical specifications or do not result in a change of condition or state of a structure, system, or component (SSC) are excluded from covered maintenance activities. These predictive maintenance activities include nondestructive analyses (NDE), thermography, vibration analysis, and data collection and analysis.’</p> <p data-bbox="732 978 794 1690">Progress Energy expressed three concerns with the proposed wording:</p> <ol data-bbox="833 957 1398 1671" style="list-style-type: none"> 1. Adding the words, ‘... that are not required by technical specifications ...’ is unnecessary and confusing. The source document requiring the predictive maintenance activity does not change the risk. Including technical specifications requirements as a qualifier increases the complexity of the implementation guidance without benefit. This will introduce inconsistency in application. Technical specifications vary from plant to plant. It is possible one plant would have a maintenance task as covered work while another plant with the same task would not include it as covered work simply due to the version of technical specification that the station has incorporated. These type of differences would lead to regulatory and inspection inconsistencies. 2. Adding the words, ‘... that are not required by technical specifications...’ also implies that all activities performed 	<p data-bbox="329 201 862 934">The NRC staff agrees that inconsistencies between technical specifications at different sites could result in inconsistencies in the implementation of the requirements in Subpart I, “Managing Fatigue,” of Title 10 Part 26, “Fitness for Duty [FFD] Programs,” of the <i>Code of Federal Regulations</i> (10 CFR Part 26). The NRC staff also acknowledges that the wording of Regulatory Position 1 in DG-5026 could be interpreted to mean that all predictive maintenance activities required by technical specifications would be covered maintenance activities. The staff agrees that predictive maintenance activities other than nondestructive examination (NDE), thermography, vibration analysis, and data collection and analysis may not result in a change of condition or state of a covered SSC. The staff further agrees that starting or stopping a covered SSC would be performing work under the operating category.</p> <p data-bbox="899 201 1130 934">However, the NRC staff believes that the definition, proposed by NEI, of maintenance activities that may be performed by individuals who are not subject to the work-hour controls required in 10 CFR 26.205, “Work Hours,” lacks precision and would be difficult to implement. Therefore, Regulatory Position 2 in the final regulatory guide clarifies the definition of excluded predictive maintenance activities as follows:</p> <p data-bbox="1167 212 1398 934">“Predictive maintenance activities that do not result in a change of condition or state of a structure, system, or component (SSC) that a risk-informed evaluation process has shown to be significant to public health and safety may be excluded from covered maintenance activities. Examples of activities that may be excluded if they do not change the state or condition of these SSCs include, but are not limited to,</p>

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	<p>per technical specifications should be considered covered work. This could include such categories as performance of reactor engineering calculations required by technical specifications, system engineering walkdowns that are performed using a preventive maintenance work order, or analyzing and trending predictive maintenance data such as pump vibration or thermography. These maintenance activities are data gathering or calculation activities ... that are non-intrusive and do not pose significant risk to public health and safety from a worker fatigue error.</p> <p>3. Predictive maintenance is not easily defined. The staff's proposed wording removed the words, 'such as,' from the NEI 06-11, Revision E wording. Removal of these words implies that only the listed activities can be excluded and are not simply examples of work activities that can be excluded from covered work. Other activities such as lube oil analysis could be considered predictive maintenance.</p> <p>Based on discussion at the October 16 public meeting on the fatigue management rule, the industry revised NEI 06-11 to clarify that activities that have not historically been defined as maintenance, that are non-intrusive, and pose low risk to the health and safety of the public are excluded from covered work.</p> <p>Industry Position: The industry's position is included in NEI 06-11, 'Managing Personnel Fatigue at Nuclear Power Reactor Sites,' Revision 1, Section 6.2 and is below.</p> <p>Work hour controls do not apply to the following individuals and activities:</p>	<p>nondestructive examination (NDE), thermography, vibration analysis, and data collection and analysis.”</p>

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	<p>Maintenance, as defined per Part 26, does not include activities that have not historically been defined as maintenance, that are non-intrusive, and pose low risk to the health and safety of the public, such as calculations, non-destructive analysis (NDE), thermography, vibration analysis, data collection and analysis.</p> <p>Note: At times an activity requires starting or stopping a piece of equipment. The worker starting or stopping the equipment would be performing covered work under the operating category; however, the data collection activity would not be considered a covered work activity.</p>	
<p>2 NEI and supporters, Progress Energy</p>	<p><u>Regulatory Position 2—Periodic Overtime</u></p> <p>NEI revised its guidance on Periodic Overtime in Section 7.1 of NEI 06-11 in response to feedback from the October 16 public meeting on the fatigue management rule. The document now states that licensees will perform at minimum a quarterly review comparing actual work hours for covered workers to the 54-hour per week average per shift cycle criterion. Each station will document any issues it discovers during these reviews in its Corrective Action Program. (NEI).</p> <p>Progress Energy and other commenters endorsing NEI’s changes requested that NRC endorse NEI 06-11, Revision 1, Section 7.1, “Periodic Overtime.”</p> <p>The commenters explained that the rule uses the shift schedule of the worker to determine minimum days off (MDO) but does not provide a precise definition of shift schedule. They stated, “NRC’s guidance in DG-0526 would implement a running average of hours worked during a work cycle to calculate minimum days off for that work cycle. This method could have unintended consequences on the continuity of supervision and emergent work activities.” The commenters argued that</p>	<p>The NRC reviewed the guidance in NEI 06-11, Revision 1, “Managing Personnel Fatigue at Nuclear Power Reactor Sites,” Section 7.1, “Periodic Overtime.” As described in DG-5026, the implementation guidance in Section 7.1 of NEI 06-11 introduces the concept of “periodic overtime.” The rule does not include this concept, and it is not necessary to do so. Therefore, the final regulatory guide includes an exception to the concept of “periodic overtime,” as described in NEI 06-11, Revision 1.</p> <p>The implementation guidance in Section 7.1 of NEI 06-11, Revision 1, would permit licensees to establish a schedule for a shift duration (e.g., 8-hour shifts) that includes sufficient days off to meet the minimum days off (MDO) requirements for that shift duration but would allow licensees to assign or permit unscheduled work hours that could result in individuals working shift lengths (e.g., 10- or 12-hour shifts) that would require a greater number of days off under 10 CFR 26.205(d)(3). Although the guidance in Section 7.1 of NEI 06-11, Revision 1, describes a quarterly review process to address this concern, the NRC staff does not consider implementation of that process as meeting the requirements of the rule. Specifically, the process would allow work hours for</p>

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	<p>the revisions to NEI 06-11, Revision 1, will address NRC's concerns with the excessive use of periodic overtime and will provide transparency to the regulator through the corrective action program.</p> <p>Industry Recommendation: The NRC is requested to endorse the guidance provided in NEI 06-11, 'Managing Personnel Fatigue at Nuclear Power Reactor Sites,' Revision 1, Section 7.1, Periodic Overtime.</p>	<p>emergent work to be excluded from consideration in the determination of the applicable MDO requirements. In addition, by allowing deviations from the MDO requirements to be controlled through quarterly reviews, the process would circumvent the waiver requirements in 10 CFR 26.207, "Waivers and Exceptions."</p> <p>The MDO requirements in 10 CFR 26.205(d)(3) are designed to prevent cumulative fatigue while accommodating variations in workload that result from emergent work. For example, the MDO requirements for maintenance personnel on 8- and 10-hour shifts allow, on average, an extra day of work per week above a nominal 40-hour workweek. The MDO requirements for maintenance on 12-hour shifts allow, on average, an extra 1.5 days per week. In addition, the requirements allow licensees to meet the MDO requirements as an average over a period of up to 6 weeks. As a result, licensees have the flexibility to distribute these extra workdays as necessary to accommodate emergent work. As noted in the FR notice for the final rule (73 FR 16988; March 31, 2008), 10 CFR 26.205(d)(3) "accommodates a wide range of scheduling practices and short-term fluctuations in workload." Because the requirement was intended to accommodate fluctuations in workload within limits that prevent cumulative fatigue, the NRC staff does not endorse the guidance in Section 7.1 of NEI 06-11, Revision 1, which would permit these limits to be exceeded through the exclusion of work hours for emergent work.</p> <p>As stated in 10 CFR 26.205(d)(3), "Licensees shall ensure that individuals have, at a minimum, the number of days off specified in this paragraph." The staff considers the appropriate means of deviating from this requirement to be the waiver process described in 10 CFR 26.207. In this regard, the staff notes that the rule permits licensees to grant waivers of</p>

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		<p>the work-hour controls in 10 CFR 26.205(d)(1) through 10 CFR 26.205(d)(5)(i), including the MDO requirements of 10 CFR 26.205(d)(3). The waiver requirements in 10 CFR 26.207 are intended to ensure that deviations from the work-hour controls, including the MDO requirements, are limited to circumstances necessary to prevent or mitigate conditions adverse to safety or security. By allowing deviations from the MDO requirements to be controlled through quarterly reviews, and by using criteria unrelated to safety or security, the process described in NEI 06-11, Revision 1, will circumvent the rule’s waiver requirements.</p> <p>In accordance with the staff’s view that the guidance contained in NEI 06-11, Revision 1, does not provide an acceptable means to comply with the regulation, Regulatory Positions 4, 5 and 6 in the final regulatory guide revise the guidance that depends on the concept of “periodic overtime.” Regulatory Position 4 revises a paragraph in Section 7, “Work Hours Scheduling,” of NEI 03-11, Revision 1, which discusses periodic overtime. The staff’s guidance for determining the applicable MDO requirements when covered individuals or crews work unscheduled work hours is presented in Regulatory Position 5 in the final regulatory guide. Regulatory Position 6 in the final regulatory guide presents guidance the staff finds acceptable for managing work-hours transitions during a shift cycle.</p>
3 NEI and supporters	<p><u>Regulatory Position 3—Shifts of More Than 11 Hours</u></p> <p>This position is incorporated into NEI 06-11, ‘Managing Personnel Fatigue at Nuclear Power Reactor Sites,’ Revision 1.</p> <p>Industry Recommendation: Revise DG-5026 to endorse NEI 06-11, Revision 1, and</p>	<p>The NRC staff agrees that NEI 06-11, Revision 1, incorporates the additional language recommended by the staff to address average shift durations of more than 11 hours per day. Therefore, the final regulatory guide retains the guidance NEI added in NEI 06-11, Revision 1, in Regulatory Position 5.</p>

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4 NEI and supporters	<p>eliminate this position.</p> <p><u>Regulatory Position 4—Transitions</u></p> <p>This position has been incorporated into NEI 06-11, “Managing Personnel Fatigue at Nuclear Power Reactor Sites,” Revision 1.</p> <p>Industry Recommendation: Revise DG-5026 to endorse NEI 06-11, Revision 1, and eliminate this position.</p>	<p>The NRC staff considers Section 7.3, “Transitioning onto a Shift or Between Covered Groups or into a Covered Group,” of NEI 06-11, Revision 1, to be acceptable, except for the last bullet that reads, “A minimum of 2 days off in the preceding 7-day period is acceptable for operators who have been working outage hours on 10- or 12-hour shifts before they transition to the non-outage unit as one of the two required operators working non-outage minimum days off. This does not preclude short-term relief of the non-outage unit operators as described in Section 8.3.” For the reasons discussed with respect to Comment 6 in this table, the staff does not agree that only two operators on an operating unit should remain on nonoutage work hours at a multiunit site with one or more units in an outage. Therefore, Regulatory Position 7 in the final regulatory guide clarifies the last bullet before the examples in that section as follows:</p> <p>“A minimum of 2 days off in the preceding 7-day period is acceptable for operators at a multiunit site with one or more units in an outage, if the operators have been working outage hours on 10- or 12-hour shifts before they transition to an operating unit as members of the minimum shift complement described in Section 8.3.”</p>
5 NEI and supporters	<p><u>Regulatory Position 5—Unplanned Outages, Increased Threats</u></p> <p>This position has been incorporated into NEI 06-11, “Managing Personnel Fatigue at Nuclear Power Reactor Sites,” Revision 1.</p> <p>Industry Recommendation: Revise DG-5026 to endorse NEI 06-11, Revision 1, and eliminate this position.</p>	<p>Because NEI 06-11, Revision 1, incorporates the additional language recommended by the NRC staff to address transitioning into and out of unplanned unit outages, unplanned security system outages, and increased threat conditions, the final regulatory guide does not retain Regulatory Position 5 from DG-5026.</p>
6 NEI and	<p><u>Regulatory Position 6—Eligibility for Outage Minimum</u></p>	<p>The NRC staff agrees that the 25-percent criterion for</p>

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<p>supporters, Progress Energy</p>	<p>Days Off</p> <p>The industry requests that the staff reconsiders their position on eligibility for outage minimum days off and endorses a requirement that a minimum of one reactor operator and one senior reactor operator for each operating reactor at a multi-unit station will not be eligible for outage minimum days off. Additionally, the industry will delete the 25% criteria for determining participation in outage activities from NEI 06-11.</p> <p>This position is stated in NEI 06-11, ‘Managing Personnel Fatigue at Nuclear Power Reactor Sites,’ Revision 1, as follows:</p> <p>Workers Eligible to Work Outage Hours</p> <ul style="list-style-type: none"> • Covered workers at single sites working on outage activities are eligible • Covered workers at multi-unit sites with one unit in an outage that are working on outage activities are eligible • Covered workers, due to Emergency Response Organization, Fire Brigade, or Security duties, at a multi-unit sites with a unit in an outage are eligible • Covered workers at multi-unit sites that work on both outage activities and operating unit activities are eligible, with the exception described below: <p>Workers Not Eligible to Work Outage Hours</p> <p>One reactor operator assigned to the controls and one senior reactor operator assigned to the controls for each operating unit at a multi-unit station while any unit is in an outage. This does not prevent short term relief of these licensed operators by licensed operators that are eligible for outage work hours.</p> <p>Eligibility should be established on an individual or defined group basis. Eligibility should be evaluated each 15 days for</p>	<p>determining participation in outage activities should be deleted from the final regulatory guide. However, the staff’s position remains that, at a minimum, those individuals who constitute the operator minimum shift complement, including the operator at the controls and the senior operator in the control room, as specified in 10 CFR 50.54, “Conditions of Licenses,” for the operating unit at a multiunit site should not work the longer work hours that the rule permits for outages, because these individuals’ primary duties are to ensure the safe operations of the operating unit. Regulatory Position 11 in the final regulatory guide retains the staff’s position, as described in DG-5026, with the following two additions.</p> <p>In recognition of the flexibility that the relevant regulations, standard technical specifications, and licensees’ administrative procedures permit in addressing control room staffing, the final regulatory guide clarifies that operators who are working on an operating unit and maintaining operating work hours may perform outage activities.</p> <p>The final regulatory guide also permits operators who have been working outage hours to provide short-term relief (not to exceed 2 hours) for the operator at the controls or the senior operator in the control room of an operating unit in limited circumstances. Regulatory Position 11 in the final regulatory guide includes the following guidance:</p> <p>“An operator who has been working outage work hours and has had 2 days off in the previous 7-day period may provide relief to the operator at the controls or the senior operator in the control room, if an appropriately qualified operator who has been working nonoutage work hours is not immediately available to provide relief. If an operator who has been working outage work hours and has had 2 days off in the previous 7-day period is not immediately available, an</p>

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	<p>each individual or defined group during the outage.</p> <p>The industry also requests that the statement of considerations for 10 CFR Part 26 be revised to reflect the Commission's action to remove 'solely' from the rule."</p>	<p>operator who has been working outage hours may provide (1) short-term relief (up to 2 hours) for the operator at the controls or the senior operator in the control room without a waiver or (2) longer term relief (more than 2 hours) under a waiver of the MDO requirement that is applicable to the shift schedule (i.e., 8-, 10-, or 12-hour shifts) for personnel assigned to the operating unit."</p> <p>The final regulatory guide includes additional changes to the guidance in NEI 06-11, Revision 1, in Regulatory Position 3 (i.e., a clarification that the emergency response organization's minimum shift complement differs from the minimum shift complement of operators) and Regulatory Position 11 (i.e., three of the examples) to ensure that the guidance conforms to the staff's position.</p> <p>The staff disagrees that a revision to the Statement of Considerations (SOC) for the rule is necessary.</p> <p>NUREG-1912, "Summary and Analysis of Public Comments Received on Proposed Revision to 10 CFR Part 26, 'Fitness for Duty Programs,'" (in press) discusses the Commission's direction to remove "solely" from the rule.</p>
<p>7 NEI and supporters, Progress Energy</p>	<p><u>Regulatory Position 7—Reviews</u></p> <p>NEI and other industry representatives endorsing the NEI submittal, including Progress Energy, commented that the NRC's proposed paragraph on the review of job performance data unnecessarily increases the scope of the annual review because it omits the rule's minimum list of individuals who must be subject to review. They stated, "The rule requires job performance reviews for the following:</p> <ul style="list-style-type: none"> • Individuals whose actual work hours worked during the review period exceeded an average of 54 hours per week 	<p>The NRC staff agrees that the review requirements in 10 CFR 26.205(e) specify minimum requirements for the review; therefore, this provision does not require the review of all job performance data at a station. The NRC staff also agrees that it is appropriate for the implementation guidance to include these minimum requirements. However, the staff believes that the guidance in Section 15, "Reviews," of NEI 06-11, Revision 1, numbered paragraphs 1 and 2, could be interpreted in such a way that the conduct and scope of the review would be inconsistent with the intent of the requirement. As a result, the final regulatory guide includes a clarification to provide alternate guidance that adopts the</p>

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	<p>in any shift cycle while the individuals' work hours are subject to the requirements of § 26.205(d)(3).</p> <ul style="list-style-type: none"> • Individuals that were granted more than one waiver during the review period. • Individuals that were assessed for fatigue under § 26.211 during the review period. <p>Because it does not include a minimum list of qualifiers for the review, the proposed paragraph could be interpreted as requiring annual review of all job performance data at the station with respect to the effects of duration, frequency, and sequencing of work hours on performance.”</p> <p>NEI stated that it revised its implementation guidance, based on the NRC’s feedback, to include an emphasis on worker performance in the review. NEI requested that the NRC endorse the review requirement that is included in NEI 06-11, Revision 1, “Managing Personnel Fatigue at Nuclear Power Reactor Sites:”</p> <p>Licensees shall:</p> <p>Review the actual work hours of covered individuals for consistency with work hours scheduling requirement objective of preventing impairment from fatigue due to duration, frequency, and sequencing of hours worked. The review should be based on information associated with fatigue, including but not limited to, the corrective action program. At a minimum, this review should address:</p> <ul style="list-style-type: none"> • 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. • Individuals who were granted more than one waiver during 	<p>minimum review requirements and also addresses the NRC staff’s concerns regarding the conduct and scope of the review. The following paragraphs address the staff’s specific concerns with the guidance in NEI 06-11, Revision 1, Section 15.</p> <p>NEI 06-11, Revision 1, emphasizes the review of worker performance by separating the guidance concerning review of worker job performance from the review of actual hours worked. As a result, the guidance could be interpreted to require two independent reviews. The intent of the requirement is for licensees to conduct a single review in which worker performance and actual hours worked are reviewed in an integrated assessment to identify potential correlations between actual hours worked and job performance. The objective of the review is to identify relationships between the worker’s job performance and the actual frequency, duration, or sequencing of successive shifts that might be meaningful to a licensee’s assessment of its performance regarding the performance objectives of 10 CFR 26.205(c). Accordingly, the final regulatory guide includes a clarification to NEI 06-11, Revision 1, Section 15, which replaces the guidance in numbered paragraphs 1 and 2 with a single paragraph that provides guidance consistent with the intent for a single integrated assessment.</p> <p>Further, NEI 06-11, Revision 1, limits the scope of the review of worker performance and actual work hours to “information associated with fatigue.” The NRC staff believes this guidance can be interpreted to mean that, in conducting an annual review in accordance with 10 CFR 26.205(e), a licensee need consider only information that was previously identified as contributing to or associated with fatigue (e.g., work hours or worker performance that was identified through a problem report or root cause analysis as associated with fatigue). Although the staff agrees that inclusion of such</p>

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	<p>the review period.</p> <ul style="list-style-type: none"> Individuals who were assessed for fatigue during the review period. <p>Industry Recommendation: Revise DG-5026 to endorse NEI 06-11, Revision 1, and eliminate this position.</p>	<p>information is appropriate, limiting the review to information that has been predetermined to be associated with fatigue is inconsistent with the intent of the requirement as described in the preceding paragraph. However, the NRC is also mindful of licensees' need to be efficient and effective in the conduct of such reviews. In this regard, the NRC agrees with the commenters that the rule establishes a minimum scope for the review and has incorporated these minimum criteria in Regulatory Position 14 of the final regulatory guide.</p>
8	<p>Additional Comments—Shift Turnovers</p> <p>The commenters stated, “The description of shift turnovers in NEI 06-11, ‘Managing Personnel Fatigue at Nuclear Power Reactor Sites,’ Revision E provides a constraint that is not required by the rule. The NEI guidance allowed the licensee to only exclude one period of shift turnover time from work hour calculations. As the industry has begun preparing schedules and procedures for implementing this rule, it has become apparent that some category of workers requires a shift turnover at the beginning and the end of the work period to safely and effectively transfer job positions. This has made it necessary to revise the industry guidance on shift turnovers to align with rule requirements.</p> <p>This section was changed to read:</p> <p><i>Shift turnover</i> Licensees may exclude 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</p>	<p>The NRC staff accepts the portion of NEI 06-11, Revision 1, which permits licensees to exclude the time that individuals spend on shift turnover from the calculation of individuals’ work hours and one period of shift turnover from the calculation of break times between successive work periods.</p> <p>The staff agrees that the time required for security personnel to arm and disarm may be considered shift turnover activities for the calculation of work hours. Shift turnover activities specified in 10 CFR 26.205(b)(1) include “only those activities that are necessary to safely transfer information and responsibilities between two or more individuals between shifts.” The NRC’s requirements for nuclear power plant security plans effectively mandate that many security posts at nuclear power plants be staffed 24 hours a day, 7 days a week by armed security personnel. To provide continuous staffing at these posts with armed personnel, it is necessary for security personnel to arm before the beginning of their shift and disarm following the end of their shift. Therefore, the NRC considers the arming and disarming activity to be necessary to safely transfer responsibilities between security officers. As a result, the time for arming and disarming may be considered turnover.</p> <p>The staff does not agree that the activities of donning and</p>

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	<p>and components. Turnovers for supervisors may be more extensive than for workers and will therefore may be longer. Turnover may include time necessary to prepare for specific job requirements for example arming and disarming times for security guards or donning or un-donning of protective clothing for radiation workers as necessary to support turn-over.</p> <p>Licenses may exclude either the oncoming or off going shift turnover, but not both, from the calculation of break times between successive work periods.</p> <p>Licenses 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.”</p> <p>Industry Recommendation: It is requested that the NRC endorse the revised shift turnover guidance that is included in NEI 06-11, ‘Managing Personnel Fatigue at Nuclear Power Reactor Sites,’ Revision 1.</p>	<p>doffing protective clothing for radiation workers fall within the scope of shift turnover activities specified in 10 CFR 26.205(b)(1). Although donning and doffing protective clothing are activities necessary for individuals to perform their job duties, they are typically not required to safely transfer responsibility between shifts or to continuously staff positions that are required by NRC regulations.</p> <p>Therefore, Regulatory Position 8 in the final regulatory guide clarifies the staff’s position that arming and disarming may be considered shift turnover but deletes reference to donning and doffing protective clothing, as these activities should be considered covered work and included in the calculation of individuals’ work hours.</p>
9 NEI and supporters	<p>Additional Comment—Training</p> <p>Changes have been made to NEI 06-11, ‘Managing Personnel Fatigue at Nuclear Power Reactor Sites,’ Revision 1 to provide reference to NEI 03-04, ‘Guideline for Plant Access Training,’ for specific training objectives that are a requirement of the rule. These references appear in Section 1 Introduction, Section 12 Fatigue Assessments, and Section 14 Training.</p> <p>Industry Recommendation:</p>	<p>The NRC staff has not reviewed NEI 03-04 and, therefore, has not determined that implementation of NEI 03-04 would adequately meet the training requirements of 10 CFR Part 26. Regulatory Position 1 in the final regulatory guide provides this clarification.</p>

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	It is requested that the NRC endorse these changes in NEI 06-11, 'Managing Personnel Fatigue at Nuclear Power Reactor Sites,' Revision 1.	
10 NEI and supporters	<p><u>Additional Comment—Consideration for Enforcement Discretion</u></p> <p>The industry has discussed with the NRC staff that the requirements of the fatigue rule and the implementation guidance will result in the need to increase staff. In some cases, such as security the nominal staffing increases expected across the industry is 20%. The time required in hiring and training of the new staff may result in challenges as the rule is implemented and could lead to an increase in the use of waivers. The industry asks the NRC to consider a period of 6 months of enforcement discretion following the implementation date of October 1, 2009 in order to facilitate transition to the new rule.</p>	The NRC staff will evaluate specific requests for enforcement discretion that are supported by an adequate technical basis. The general request contained in this comment does not include sufficient information for the staff to complete an evaluation of the need for enforcement discretion.
International Brotherhood of Electrical Workers (IBEW) Comments		
11 IBEW	<p><u>Labor-Sharing Agreements</u></p> <p>Reference in NEI 06-11: <i>Contractor/Vendor (C/V) means any company, or any individual not employed by a licensee who is providing work or services to a licensee, either by contract, purchase order, oral agreement, or other arrangement.</i></p> <p>IBEW Comment 1: Are licensee employees from one company that travel to work at another licensee company considered Contractor/Vendors? i.e., USA/STARS labor sharing program.</p>	Licensee employees who travel to work at another site, whether that site is operated by the individual's employer or another licensee, are not considered to be contractor/vendor (C/V) personnel under the definition of C/V in 10 CFR 26.5, "Definitions." As discussed in the SOC for 10 CFR 26.4, "FFD Program Applicability to Categories of Individuals," the applicability of the rule's requirements depends on the types of access and job duties an individual performs for a licensee or other entity who is subject to Part 26, regardless of the individual's employer. For clarification and to ensure consistency with the rule's intent, Regulatory Position 10 in the final regulatory guide includes a revision of Section 8.3 of NEI 06-11, Revision 1, as follows: "Licensee employees and contractor/vendor personnel may go

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		<p>from an outage at one site to an outage at another site. When a licensee employee or contractor/vendor performs covered work for a licensee during two or more unit outages or security system outages (or a combination thereof), and the interval(s) between successive outages is less than 9 days, the receiving licensee should determine that the individual has had a 34-hour break period within the 9 days that precede the day on which the individual begins working for the receiving licensee. In addition, when the individual begins work for the receiving licensee, the licensee should ensure that the individual's hours worked did not and will not exceed the following limits:</p> <ol style="list-style-type: none"> 1. 16 work hours in any 24-hour period 2. 26 work hours in any 48-hour period 3. 72 work hours in any 7-day period” <p>For individuals (either employees of a licensee or a C/V) who transition between sites under other circumstances, the NRC staff expects that the appropriate implementation guidance contained in Section 7.3 of NEI 06-11, Revision 1, would apply.</p>
12 IBEW	<p><u>Regulatory Position 1—Definition of Predictive Maintenance</u></p> <p>The IBEW provided three comments related to the definition of predictive maintenance in NEI 06-11, as follows:</p> <p>Reference in NEI 06-11: <i>Maintenance means, the following onsite maintenance activities: Modification, surveillance, post-maintenance testing, and corrective and preventive maintenance of SSCs that a risk-informed evaluation process has shown to be significant to public health and safety.</i></p> <p>IBEW Comment 2:</p>	<p>As discussed in the NRC staff's response to Comment 1 in this table, the staff agrees that predictive maintenance should be considered covered work when the task changes the state or condition of SSCs that a risk-informed evaluation process has shown to be significant to public health and safety. Therefore, Regulatory Position 2 in the final regulatory guide revises the guidance contained in Section 6.2, “Work Hour Controls for Covered Individuals,” of NEI 03-11, Revision 1, related to predictive maintenance.</p> <p>The staff also agrees with the commenter that (1) individuals who are directing covered predictive maintenance activities must also be subject to the work-hour controls of Subpart I of</p>

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	<p>The term ‘predictive’ should be included. This term should also include work events similar to recent 2008 reactor scrams from a worker using a digital camera with a flash, inspecting electrical circuits (Indian Point) and a chemistry lab computer upgrade (Hatch).</p> <p>Reference in NEI 06-11: <i>Work hour controls do not apply to the following individuals and activities:</i></p> <ul style="list-style-type: none"> <i>Predictive maintenance activities that do not result in a change of condition or state of a structure, system, or component (SSC) are excluded from covered maintenance activities such as, non-destructive analysis [sic] (NDE), thermography, vibration analysis, data collection and analysis.</i> <p>IBEW Comment 7: The IBEW disagrees with this definition for exemption. If these activities are performed with work controls on risk significant SSC the activity should be covered work. NDE radiography should be covered work due the utilization of controlled sources in work areas within the power block.</p> <p>Reference in NEI 06-11: <i>The following tasks are examples generally considered NOT directing:</i></p> <ul style="list-style-type: none"> <i>Any work that is not operations or maintenance on risk significant SSCs</i> <p>IBEW Comment 9: Predictive Maintenance methods should be included as risk significant SSC work.</p>	<p>10 CFR Part 26, and (2) the reactor scram events cited by the commenter illustrate the potential for certain maintenance activities to affect safe operations.</p> <p>With respect to NDE radiography, the NRC staff agrees that, if the NDE radiography requires a change in the state or condition of an SSC that a risk-informed evaluation process has shown to be significant to public health and safety, then the work would be considered covered work. However, the presence of a controlled source in the work area in itself would not fall within the scope of predictive maintenance activities that must be performed by individuals who are subject to the work-hour controls in 10 CFR 26.205. Therefore, the staff has not added this consideration to the final regulatory guide.</p> <p>The staff also has not added the term, “predictive,” to the definition of maintenance in NEI 06-11, Revision 1, because changing the definition of maintenance in the final regulatory guide would create an inconsistency with the definition of maintenance in 10 CFR 26.5, “Definitions.” Further, predictive maintenance is commonly understood within the nuclear power industry to fall within the scope of preventive maintenance activities. For example, NUMARC 93-01, “Industry Guideline for Monitoring the Effectiveness of Maintenance of Nuclear Power Plants,” includes predictive maintenance activities as one type of preventative maintenance. Therefore, the staff considers adding the term in the final regulatory guide to be both inconsistent and unnecessary.</p>
13	<p>IBEW</p> <p>Exclusion of Unpaid Union Business from Work Hours</p> <p>Reference in NEI 06-11:</p>	<p>The NRC staff agrees that “unpaid union business,” like any other activity that may occur on site that is not performed for the licensee, may be considered personal time in which an</p>

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	<p><i>Personal time in which an individual is on-site but is off duty (i.e., before or after his/her normally scheduled work period in which work activities are performed for the licensee) may be excluded. The individual may be reading the paper, in the on-site fitness center, eating breakfast, etc.</i></p> <p>IBEW Comment 3: At union represented facilities, employees may be performing union business off-duty while at the facility. ‘Unpaid union business’ should be added prior to the ‘etc.’</p>	<p>individual is on site but is not performing covered work. The staff has not added the recommended phrase to the final regulatory guide because of concerns that the examples in NEI 06-11, Revision 1, may not apply to all circumstances for all licensees or other entities subject to Subpart I of 10 CFR Part 26. Adding another example would be inconsistent with the staff’s concerns as stated in Regulatory Position 15 in the final regulatory guide.</p>
14	<p>IBEW</p> <p><u>Including Unpaid Work in Work-Hours Calculations</u></p> <p>Reference in NEI 06-11: <i>Verifying his/her working hours are correctly documented regardless of whether he/she is paid for the hours worked.</i></p> <p>IBEW Comment 4: This needs explanation; IBEW does not condone working without pay for a public rule regulatory implementation guide.</p>	<p>As discussed in the SOC for 10 CFR 26.205(b), compensation for work performed for a licensee is not a determining consideration in the calculation of an individual’s work hours under Subpart I of 10 CFR Part 26. The NRC recognizes that some personnel perform work for a licensee that falls outside their normally scheduled shift. The rule requires that these hours be included in the calculation of the individual’s work hours for the purposes of preventing and mitigating the effects of fatigue on job performance. Because the implementation guidance referenced by the commenter is consistent with the rule’s intent and requirements, the staff has not added an explanation in the final regulatory guide.</p>
15	<p><u>Reporting Fatigue-Related Concerns</u></p> <p>Reference in NEI 06-11: <i>Being aware of the total hours worked in the previous 14 days and notifying management if work hour limits will be exceeded if asked to work additional hours.</i></p> <p>IBEW Comment 5: Are fatigue concerns appropriate to document in a Behavior Observation Program (BOP)? Is it the correct vehicle?</p>	<p>The correct method for reporting fatigue concerns depends on the type of concern and the reporting procedures the licensee has established. If an individual is concerned 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 individual should follow the self-declaration procedures that licensees are required to establish under 10 CFR 26.203(b)(1). If an individual is concerned that a coworker may not be fit to safely and competently perform duties as a result of fatigue (or any other cause), 10 CFR 26.33, “Behavioral Observation,” requires the individual to report the concern to the personnel designated in the licensee’s FFD policy.</p>

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		<p>10 CFR 26.29(a)(10) requires licensees to train personnel on the procedures to follow to make a self-declaration of fatigue and to report a fitness concern about a coworker.</p> <p>10 CFR 26.29(a)(10) also requires licensees to ensure that individuals have the ability to initiate the appropriate actions if an individual has a concern.</p> <p>Concerns regarding licensee implementation of the fatigue management requirements of 10 CFR Part 26 should be reported and addressed through the licensee's process(es) for the identification and resolution of safety concerns or may be reported directly to the NRC through its allegations process.</p>
16	<p><u>Work-Hours Tracking Tool for Individuals</u></p> <p>Reference in NEI 06-11: <i>Being aware of the total hours worked in the previous 14 days and notifying management if work hour limits will be exceeded if asked to work additional hours.</i></p> <p>IBEW Comment 5: GENERAL NOTE: This guide should include a standardized tracking tool form (pocket size?) for covered and potential covered worker to assist in keeping adequate record for the 'awareness requirement.' Being 'sure' is much better than being 'aware' when individuals will be trained to consequences for failing the company fatigue policy.</p>	<p>Although 10 CFR Part 26 does not impose a requirement on individuals to track their work hours and days off, the NRC staff has not taken an exception to the guidance in NEI 06-11, Revision 1, that suggests individuals should maintain records of their work hours and days off. However, the staff notes that responsibility for ensuring that covered workers' work hours are controlled in accordance with the regulation rests with the licensee for whom the individual is performing covered duties. The NRC staff expects that licensees and other entities who implement this final regulatory guide will differ in the procedures and tools they develop to aid individuals in tracking the information that is required by the licensees' or other entities' fatigue management programs. Therefore, the final regulatory guide does not include a standardized tracking tool.</p>
17	<p><u>Applicability of Work-Hour Controls to Quality Control/Quality Assurance Activities</u></p> <p>Reference in NEI 06-11: <i>Work hours controls do not apply to the following individuals and activities:</i></p>	<p>The NRC staff agrees that any individual who is performing the activities specified in 10 CFR 26.4(a) must be subject to work-hour controls, including individuals who are certified to perform quality control (QC) activities. However, 10 CFR Part 26 does not currently require that individuals who are solely performing QC activities, without also performing</p>

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	<ul style="list-style-type: none"> • <i>Quality control and quality assurance activities.</i> <p>IBEW Comment 6: Individuals who are certified to do QC activities and perform rule covered work (multi-qualifications) who are a part of a work crew doing covered work, should have their work counted as covered work.</p>	<p>the work activities described in 10 CFR 26.4(a), must be covered by work-hour controls. In a staff requirements memorandum (SRM) dated April 17, 2007, the Commission directed the staff to extend the rule's work-hour requirements to cover personnel who perform QC and quality verification activities. The NRC staff is currently working to implement the SRM.</p>
18	<p><u>Escort Qualifications</u></p> <p>The IBEW provided two comments related to the technical qualifications of individuals who are escorting C/Vs, as follows:</p> <p>Reference in NEI 06-11: <i>Work-hour controls do not apply to the following individuals and activities:</i></p> <ul style="list-style-type: none"> • <i>Contractor/Vendors, who are not granted unescorted access (i.e., the individual is escorted), conducting work on a risk-significant system, structure, or component onsite</i> <p>IBEW Comment 8: Clarification requested. Is the person escorting the C/V required to be certified on the activity being performed if the licensee has such qualified individuals on-staff?</p> <p>Reference in NEI 06-11: <i>In order to grant a waiver, the licensee shall meet the following requirements:</i></p> <ol style="list-style-type: none"> 1. <i>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</i> 	<p>There is no requirement in 10 CFR Part 26 that an escort must be certified on or otherwise qualified to oversee the activities being performed by an escorted C/V. The NRC is enhancing its requirements for the technical qualifications of escorts in other rulemaking activities. Therefore, the NRC staff has not added guidance regarding the technical qualifications of escorts because it is beyond the scope of this final regulatory guide.</p> <p>Further, the activity of escorting a C/V is distinct from the activity of assessing an individual for a waiver of the work-hour controls under 10 CFR 26.207. Specifically, in the case of an escorted C/V, there is no a priori reason to believe that the individual is impaired from fatigue or may become impaired. By contrast, an individual who is being considered for a waiver of the work-hour controls will be working longer hours than the rule would otherwise permit. Therefore, there is a basis to anticipate that the individual could be subject to impairment from fatigue. Accordingly,</p> <p>10 CFR 26.207(a)(1)(ii) requires that the supervisor determine 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. If the supervisor determines that there is a potential for fatigue-related degradations in alertness and performance to affect risk-significant functions, the rule requires the supervisor to establish controls and conditions under which the individual will be permitted to perform work,</p>

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	<p><i>with the requirements of §§ 26.29 and 26.203(c) and shall be qualified to oversee the work to be performed by the individual.</i></p> <p>IBEW Comment 17: This ties back to the Pg. 12 C/V qualification concern for oversight of work performed by C/Vs. This presents a double standard in the rule if escorted C/Vs are not required to have qualified individuals overseeing the work of the C/V on risk significant SSCs.</p>	<p>such as peer review and approval of job tasks or provisions for additional rest breaks. As described in the SOC for 10 CFR 26.207(a)(1)(ii), assessing the risks associated with the tasks that the individual will be performing and establishing appropriate controls and conditions both require detailed knowledge of the tasks to be performed by the individual working under a waiver. Because the activity of escorting a C/V and conducting a supervisory assessment are fundamentally different, the NRC staff does not agree that the rule presents a double standard.</p>
19	<p><u>Role of Reactor Engineer in Fuel Movement</u></p> <p>Reference in NEI 06-11: Example 3: <i>The Reactor Engineer is required by station procedures to be present during fuel movement. The Reactor Engineer's function is to observe the fuel movement activity and provide technical recommendations to the fuel handling SRO. Is the Reactor Engineer a covered individual?</i></p> <p><i>Answer: The Reactor Engineer is not directing, they are providing technical information and observing and therefore not conducting covered work. The fuel handling SRO would be directing and is a covered individual.</i></p> <p>IBEW Comment 10: If the Reactor Engineer would be directing where fuel rods were to be located and tracking such results, the answer should be YES, the work should be subject to fatigue provisions. Observing and not interfacing with the SRO would not be directing, and therefore, not covered work.</p>	<p>The NRC staff agrees that directing nuclear fuel movement operations is covered work under the work-hour requirements. In 10 CFR 26.5, the term "directing" is defined as "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." However, 10 CFR 50.54(m)(2)(iv) reserves responsibility for directing fuel movement for a senior operator or a licensed fuel-handling senior operator. Therefore, a reactor engineer is prohibited, by regulation, from directing these activities. The NRC staff is not including this recommendation in the final regulatory guide because it would be inconsistent with the current regulations.</p>
20	<p><u>Role of Reactor Engineer in Control Room</u></p> <p>Reference in NEI 06-11:</p>	<p>The NRC staff considered the issue raised by the commenter when developing 10 CFR Part 26 and determined that performing criticality calculations, although important to</p>

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	<p>Example 4: <i>The Reactor Engineer is required by station procedures to be present during reactor startup. The Reactor Engineer’s function is to provide information to the control room supervisor on the reactivity of the reactor during the approach to criticality. Is the Reactor Engineer a covered individual?</i></p> <p><i>Answer: The Reactor Engineer is not directing, they are providing technical information and therefore not conducting covered work. The control room supervisor would be directing and is a covered individual.</i></p> <p>IBEW Comment 11: Is it good for nuclear safety for criticality calculations to be made while in the control room as a non-covered individual for fatigue as an outage is transferring to power operations based from this individual’s direct work via calculations to commence nuclear chain reactions?</p>	<p>public health and safety, is not within the scope of work activities that must be performed by individuals who are subject to the work-hour controls in 10 CFR 26.205. Therefore, the final regulatory guide does not include an exception, addition, or clarification to address this comment.</p>
21	<p>Emergent Training</p> <p>Reference in NEI 06-11: <i>Staffing levels should be sufficient so that schedules (over non-outage periods) for the covered individuals can be maintained based on vacation and emergent training demand without relying on waivers. 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 workloads, and for maintaining sufficient staff to get the work done. Normal variation in the vacation demand, training demand, and emergent or extraordinary work demands will require periodic overtime. Section 15, Reviews, addresses an annual performance based assessment of the work schedule.</i></p>	<p>The staff has not added examples of “emergent training” in the final regulatory guide because the staff does not agree with the concept of “periodic overtime” that is referenced in this paragraph of NEI 06-11, Revision 1. The basis for the staff’s exception to the concept of periodic overtime is discussed in the response to Comment 2 in this table. Regulatory Position 4 of the final regulatory guide includes a revision to this paragraph of NEI 06-11, Revision 1, which deletes the term “emergent training” from the guidance.</p>

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	<p>IBEW Comment 12: Can examples of emergent training be explained?</p>	
22	<p>Reference to “Training Weeks”</p> <p>Reference in NEI 06-11: <i>After hours study time “during training weeks” shall be excluded from work hour calculations.</i></p> <p>IBEW Comment 13: Craft training is often not on specific cyclic ‘training weeks’ as operations workers are accustomed to rotate through.</p>	<p>The NRC staff agrees with this comment and clarifies this sentence in Regulatory Position 9 in the final regulatory guide. Specifically, the NRC staff is revising the first sentence of the second paragraph under the heading, “Incidental duties performed off site,” in Section 8.1 of NEI 06-11, Revision 1, as follows:</p> <p>“After-hours study time that is not required by the licensee may be excluded from work-hour calculations.”</p>
23	<p>After-Hours Study Time</p> <p>Reference in NEI 06-11: <i>Appropriate after hours study time complements the utility provided training to ensure the learning process occurs and optimal information retention is achieved.</i></p> <p>IBEW Comment 14: Training is not defined in the definition table. Licensees may also have built-in study time on property for self study. This sentence should be removed.</p>	<p>The NRC staff agrees that NEI 06-11, Revision 1, does not define the term “training.” The staff is not adding a definition of training to the final regulatory guide because this term is defined in ANSI/ANS-3.1-1993, “Selection, Qualification, and Training of Personnel for Nuclear Power Plants,” which the staff has endorsed in Regulatory Guide 1.8, “Qualification and Training of Personnel for Nuclear Power Plants.” ANSI/ANS-3.1-1993 defines training as “an instructional program designed to develop or improve performance on the job.”</p> <p>The staff also agrees with the portion of this comment that suggests that onsite study time required by the licensee should be considered work hours for the purposes of calculating the maximum work hours permissible and the MDO requirements for covered workers under 10 CFR 26.205. After-hours self-study required by the licensee should also be considered work hours for calculation purposes, as discussed in the SOC for 10 CFR 26.205(d)(2).</p> <p>Neither training nor required study time is covered work, however. The hours spent in training or required study by a worker who otherwise performs covered duties should be</p>

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		<p>included in the calculation of the individual's work hours only if the individual participates in training or required study during a shift cycle that also includes hours worked performing covered activities (see 10 CFR 26.205(b)(3)).</p> <p>If an individual voluntarily dedicates after-hours personal time to study that is not required by the licensee, those voluntary study hours should not be considered hours worked for the purposes of calculating work hours and the MDO requirements for covered workers under the rule. As defined in 10 CFR 26.205(b), work hours are "the amount of time the individuals perform duties for the licensee." Voluntary after-hours study time does not meet this criterion. Therefore, because the sentence referenced by the commenter discusses after-hours study time that is not required by the licensee and does not conflict with the requirements for calculating work hours in 10 CFR 26.205(b)(3), the staff is not clarifying this implementation guidance in the final regulatory guide.</p>
24	<p>IBEW</p> <p>Work Performed at Home for the Licensee</p> <p>Reference in NEI 06-11:</p> <p>Example 3: <i>What "work-related" activities may be done at home on a day off without violating the "day off" intent? For example, may an individual read procedures, catch up on administrative tasks, or study for a license requalification exam for a number of hours and still count that day as a "day off"?</i></p> <p><i>Answer: "Activities initiated by the individual (not required by the licensee)" may be performed at home on a day off and not be considered "work," e.g., studying, reading work-related material, reading email.</i></p> <p>IBEW Comment 15:</p>	<p>10 CFR 26.205(b) requires licensees to include, in the calculation of an individual's work hours, the amount of time the individual performs duties for the licensee. Therefore, the NRC staff agrees that, if a licensee were to downgrade an individual if he or she does not perform an activity at home on a day off, then the activity should be considered to be required by the licensee and therefore included in the calculation of the individual's work hours. In this case, the work requirement would be implied by the licensee's employment action. However, if the licensee rewards an individual for self-initiated activities at home, the self-initiated activities would generally not be considered covered work because the licensee did not require these activities. The NRC staff is not clarifying the example referenced by the commenter in the final regulatory guide because it is consistent with the regulation.</p>

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	<p>At any such time the licensee would downgrade or reward an individual for home initiated activities on behalf of the licensee (i.e., employee evaluation) such licensee activity would be disallowed.</p>	
25	<p><u>Individuals' Work-Hours Records for a Supervisory Assessment</u></p> <p>Reference in NEI 06-11:</p> <p>3. <i>Supervisory assessment (Note: Shall be completed before start of waiver period.)</i></p> <ul style="list-style-type: none"> • <i>Work history for past 14 days as reported by the individual for whom the waiver is requested.</i> <p>IBEW Comment 16:</p> <p>A cross check should be made to the individual reported 14 day period to licensee records for the individual.</p>	<p>The NRC staff agrees that Section 9, "Waivers," of NEI 06-11, Revision 1, should include a reference to a licensee's records of the individual's work hours over the past 14 days for individuals who are being considered for a waiver of the work-hour controls in 10 CFR 26.207(a). However, the staff is aware that there may be circumstances in which the licensee does not have access to records of the individual's work history because the individual has not worked for a licensee who is subject to Subpart I of 10 CFR Part 26 within the past 14 days. Therefore, Regulatory Position 12 in the final regulatory guide replaces the bullet referenced by the commenter with the following:</p> <p>"Work history for the past 14 days, as reported by the individual for whom the waiver is requested and, if the individual has worked for a licensee who is subject to Subpart I of 10 CFR Part 26 over the past 14 days, as documented by that licensee."</p>
26	<p><u>Supervisory Qualifications for Granting Waivers</u></p> <p>Reference in NEI 06-11:</p> <p><i>In order to grant a waiver, the licensee shall meet the following requirements:</i></p> <p>1. <i>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 assessments of §§ 26.29 and 26.203(c) and shall with the requirements of §§ 26.29 and 26.203(c) and shall</i></p>	<p>The commenter has identified an inconsistency between NEI 06-11, Revision 1, and the requirements in 10 CFR 26.207(a)(1)(ii). Item 2 under the heading, "Granting Waivers," in NEI 06-11, Revision 1, Section 9, should refer to a supervisor who is qualified to "direct" the work to be performed rather than to "oversee" the work to be performed. The initial phrase in item 3 under the same heading should also refer to a supervisor who is qualified to direct the work to be performed by the individual under the waiver. To address this inconsistency, the NRC staff is incorporating a clarification under Regulatory Position 13 of the final regulatory guide. Specifically, the final regulatory guide states</p>

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	<p><i>be qualified to oversee the work to be performed by the individual.</i></p> <p><i>2. If there is no supervisor on site who is qualified to oversee 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. The Supervisor, if knowledgeable of the work activity, can be a second level supervisor or a manager in the chain of command.</i></p> <p>IBEW Comment 18: This is confusing for the supervisor oversight requirement in #3 after reading #2 requirements. Please provide an explanation on how #3 would be implemented if no supervisor was present as described in #2.</p>	<p>the following:</p> <p>“In Section 9, under the heading ‘Granting Waivers,’ replace the phrase ‘qualified to oversee the work’ with the phrase ‘qualified to direct the work’ in the second sentence of numbered item 2. Replace ‘qualified to oversee’ with ‘qualified to direct’ in the first sentence of numbered item 3.”</p> <p>The SOC for 10 CFR 26.207(a)(1)(ii) explains this section of the guidance. To address situations in which no supervisor qualified to direct the work is available on site, the final rule allows for a supervisor who is qualified to provide oversight of the work to make the assessment if he or she is trained in accordance with the requirements of 10 CFR 26.29, “Training,” and 10 CFR 26.203(c). Although this individual may be less familiar with the details of how the work is to be performed, this provision of the rule prevents the substantial burden of requiring a supervisor who is qualified to direct the work to report to the site to perform the assessment.</p>
27	<p><u>Bases for Disciplinary Actions</u></p> <p>The IBEW provided two comments related to implementation guidance in NEI 06-11 regarding conditions and considerations for taking disciplinary actions, as follows:</p> <p>Reference in NEI 06-11: <i>Individuals that exhibit chronic self-declaration that they are not fit for duty as a result of fatigue, absent a sound medical reason, may be subject to disciplinary action.</i></p> <ul style="list-style-type: none"> • <i>Personnel are required to be fit for duty and getting sufficient rest is required to ensure a person is not subject to fatigue.</i> • <i>Persons who make choices that result in less than the sleep necessary for that person to remain alert and avoid fatigue</i> 	<p>The NRC staff disagrees with these comments.</p> <p>10 CFR 26.27(a) requires licensees to establish a written policy and procedures to meet the general performance objectives and applicable requirements of 10 CFR Part 26.</p> <p>10 CFR 26.27(b)(8) requires the written policy to describe the consequences of violating the policy for individuals who are subject to the rule. As required by 10 CFR 26.203(b)(4), licensee procedures must identify any disciplinary actions that a licensee may impose following an individual’s fatigue assessment and the conditions and considerations for taking those disciplinary actions. The staff views both the third and fifth paragraphs of Section 10 of NEI 06-11, Revision 1, as consistent with the regulation and the NRC’s intent. The third paragraph in Section 10 appropriately conveys management expectations that may form the basis for disciplinary action in</p>

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	<p><i>are not meeting their obligation per this rule.</i></p> <p>IBEW Comment 19: Both of these bullets need to be clear that the guidance is specific to chronic fatigue based on individuals self declaring fatigue.</p> <p>Reference in NEI 06-11: <i>Facts to be considered in assessing disciplinary action shall include the employee's job assignment, past work record, and work schedule.</i></p> <p>IBEW Comment 20: Remove sentence.</p>	<p>response to individuals who frequently or repeatedly self-declare that they are not fit for duty because of fatigue without an acceptable medical explanation. The fifth paragraph in Section 10 recommends considerations for assessing disciplinary actions following a fatigue assessment. Therefore, the final regulatory guide does not include the clarification and deletion requested in the comments.</p>
28	<p><u>Time Away from Work for Fatigue Recovery</u></p> <p>Reference in NEI 06-11: <i>Personnel subject to the fatigue assessments who refuse to be assessed will be considered fatigued and unable to perform their duties. Time away from work for fatigue management recovery shall be classified as vacation, personal time (if available), or non-paid time.</i></p> <p>IBEW Comment 21: Remove second sentence of paragraph.</p>	<p>The NRC staff disagrees with this comment. As discussed in the response to the previous comment in this table, 10 CFR 26.203(b)(4) requires licensee procedures to identify any disciplinary actions that a licensee may impose related to fatigue assessments and the conditions and considerations for taking those disciplinary actions. The staff views classifying time away from work as vacation, personal time, or nonpaid time as a disciplinary action in response to a refusal to be assessed for fatigue. The staff believes that the guidance in the second sentence of the last paragraph in Section 10 of NEI 06-11, Revision 1, appropriately communicates the specific nature of the disciplinary actions licensees may take in response to an individual's refusal to be assessed. Therefore, the staff is not taking an exception to this implementation guidance in the final regulatory guide.</p>
29	<p><u>For-Cause Fatigue Assessments</u></p> <p>Reference to NEI 06-11: <i>Licensees shall ensure that fatigue assessments are applicable for all individuals in the FFD Program under the following conditions:</i></p>	<p>As required by 10 CFR 26.203(c)(2), individuals must receive training on and demonstrate, by passing a comprehensive examination, the ability to identify symptoms of worker fatigue. Further, 10 CFR 26.203(c) requires that individuals who perform fatigue assessments must also be trained and be capable of demonstrating this ability. As stated in the SOC for</p>

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	<p>1. <i>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.</i></p> <p>IBEW Comment 22: What are examples of observed conditions to consider a for cause fatigue assessment?</p>	<p>10 CFR 26.211(b), indications of fatigue may include decreased facial tone, rubbing of eyes, and slowed speech. The SOC also states that, at the extreme, workers who have acute fatigue show symptoms that are similar to those of intoxication. For example, speech may be less precise, attention may be lacking, and normal body movements and posture may be absent. The NRC staff is not adding this information to the final regulatory guide because the staff believes that Section 14, "Training and Examination," of NEI 06-11, Revision 1, adequately addresses the requirement to provide training on this topic. Specifically, the sixth bullet in the second set of bullets in Section 14 indicates that the training required under 10 CFR 26.203(c)(2) must ensure that workers are able to demonstrate an understanding of the symptoms of worker fatigue.</p>
30	<p>Forms for Fatigue Assessments</p> <p>The IBEW submitted two comments addressing documentation requirements for fatigue assessments in NEI 06-11, as follows:</p> <p>Reference in NEI 06-11: <i>A fatigue assessment must provide the information necessary for management decisions and actions in response to the circumstance that initiated the assessment.</i></p> <p>b. <i>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 only the personal information from the subject individual that may be necessary to assess the required factors.</i></p> <p>IBEW Comment 23:</p>	<p>The NRC staff agrees that a form, checklist, or other means to aid individuals in providing complete and accurate information could facilitate performing a fatigue assessment. However, the staff does not believe that use of a standardized form is necessary to comply with the fatigue assessment provisions in 10 CFR 26.211, "Fatigue Assessments." For this reason and the reasons discussed in response to Comment 16 in this table, the staff is not adding standardized forms to the final regulatory guide.</p> <p>In addition, although the staff does not object to the guidance in NEI 06-11, Revision 1, which suggests that individuals should maintain documentation of their work histories over the past 14 days, the staff did not intend to impose a recordkeeping burden on individuals in the rulemaking. The guidance in Section 12.6, "Assessment Process," of</p>

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	<p>A standardized form should be part of this potential regulatory implementation guide.</p> <p>Reference in NEI 06-11:</p> <p>2. <i>Assessment</i></p> <ul style="list-style-type: none"> • <i>Work history for past 14 days as reported by the individual.</i> <p>IBEW Comment 25:</p> <p>This should read "...as reported and documented by the individual."</p>	<p>NEI 06-11, Revision 1, which asks individuals to report (without documenting) their work histories for the past 14 days is consistent with the applicable requirement in 10 CFR 26.211(c)(2). Further, the staff is aware that some individuals who have not been subject to Subpart I of 10 CFR Part 26 may not have complete documentation of their work histories over the past 14 days because they are new to the industry or were not previously performing covered work. These individuals may not have been trained or otherwise informed by a licensee that documentation of their work histories for the past 14 days might be required. As a result, they would be unable to comply with guidance to both report and produce documentation of their work histories for the past 14 days. Therefore, the staff is not adding the suggested phrase, "and documented by the individual," to the final regulatory guide.</p>
31	<p><u>Bases for For-Cause Fatigue Assessments</u></p> <p>Reference in NEI 06-11:</p> <p>1. <i>Identification of condition requiring a fatigue assessment:</i></p> <ul style="list-style-type: none"> • <i>For Cause—description of observed behavior</i> <p>IBEW Comment 24:</p> <p>Replace 'behavior' with 'condition.' (See pg. 43 "For-Cause")</p>	<p>The NRC staff disagrees with this comment. As required by 10 CFR 26.211(a)(1), a licensee must conduct a fatigue assessment for cause if an individual is observed to be in a condition creating a reasonable suspicion of impaired individual alertness. As stated in the SOC for 10 CFR 26.211(b), behaviors such as rubbing of eyes, slowed speech, speech that is less precise, and the absence of normal body movements and posture are indications of a condition of impaired alertness that may warrant a fatigue assessment. Therefore, the staff finds the wording in NEI 06-11, Revision 1, to be acceptable and has not included the recommended clarification in the final regulatory guide.</p>
32	<p><u>Training Outcomes</u></p> <p>Reference in NEI 06-11:</p> <p><i>Workers should be able to:</i></p> <ul style="list-style-type: none"> • <i>Discuss the consequences of failing to comply with the licensee's fatigue management policy.</i> 	<p>The context of this bullet in Section 14, "Training and Examination," of NEI 06-11, Revision 1, is a discussion of the knowledge and abilities that workers must have to ensure that they understand the consequences of failing to comply with the licensee's fatigue management policy. Although the NRC staff does not disagree with the content of the commenter's</p>

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	<p>IBEW Comment 26: This consequence discussion should be well rounded and not one way. Include individual consequences from the licensee and licensee consequences from the regulator.</p>	<p>suggested modification, Subpart I of 10 CFR Part 26 does not require such a discussion. Therefore, the final regulatory guide does not include this recommendation.</p>
<p>Building and Construction Division of AFL-CIO and Associated Maintenance Contractors Comments</p>		
<p>33 AFL-CIO & AMC</p>	<p>Comment on 10 CFR Part 26, Subpart I: Reducing overtime (and therefore earning) opportunities at nuclear refueling outages will dissuade construction workers from accepting employment there if more lucrative construction opportunities within other industries are available.</p> <p>Therefore, we are concerned that the new regulations for managing personnel fatigue at nuclear power plants, set forth in Subpart I of 10 CFR Part 26, will discourage the most highly qualified and skilled workers from accepting job offers with contractors at nuclear power plants because of reduced earnings opportunities. We predict that the regulations will have the unintended effect of producing chronic low nuclear-rotatee rates, by experienced construction workers when employment in that industry becomes a third or fourth-choice option in light of other opportunities in a booming industrial construction marketplace. As a result, nuclear contractors will likely experience a lack of available skilled labor during outages at nuclear power plants, resulting in the potential for unintended consequences such as higher rates of work-related injuries, reduced work quality and longer outage durations.</p>	<p>During the rulemaking process, the NRC considered the issues this comment raises and made a number of adjustments to the provisions in the final rule to allow longer work hours for covered maintenance personnel. However, these individuals perform important functions that may directly affect public health and safety. As a consequence, the final rule retained fatigue management requirements for this group of individuals. Because 10 CFR Part 26 codifies these requirements, the final regulatory guide does not address this comment.</p>
<p>34 AFL-CIO & AMC</p>	<p>Comment on 10 CFR Part 26, Subpart I: We understand that Draft Regulatory Guide DG-5026 is designed to provide guidance on the implementation of the fatigue management rules of Subpart I of 10 CFR Part 26, and that this is not the forum for urging changes to the regulations. Nevertheless, we feel the Commission should be aware of our</p>	<p>The fatigue management provisions in 10 CFR Part 26 apply based on an individual’s job duties and whether the individual has unescorted access to nuclear power plant protected areas. These provisions are not based on job titles. Consequently, Subpart I of 10 CFR Part 26 does not call out “construction workers” by name, although the NRC staff expects some</p>

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	<p>concerns with respect to the impact of the regulations and urge the Commission to reconsider application of the regulations to construction workers hired on a temporary full-time basis to perform maintenance work at nuclear stations. In addition, for these same reasons we believe that the fatigue rules need to be reexamined to the extent they are deemed to apply to construction workers during the construction phase of new nuclear power facilities once the nuclear fuel is received on site. Alternatively, the Commission, for the above reasons, should issue an exemption from the fatigue management rules, pursuant to 10 CFR Part 26, Subpart A, Section 26.9, for such construction workers when they are performing maintenance and new construction work.</p> <p>Until there is a change in the regulations, we are requesting that the activities subject to the requirement of one day off in any seven-day period during the first 60 days of a unit outage include pre-outage activities performed by construction workers not regularly employed at the site. We suggest, therefore, that Regulatory Guide DG-5026 be modified to make clear that the first 60-day period of a unit outage includes pre-outage work by construction workers hired temporarily by licensees or by contractors of licensees to perform maintenance work related to outage activities. If the Commission believes such modification is not possible without an exemption pursuant to 10 CFR Part 26, Subpart A, Section 26.9, please treat this letter as a request for such exemption. With this clarification or exemption, such workers would be covered by the minimum days off requirements of Section 26.205(d)(4), as long as the total of pre-outage and outage activities do not exceed 60 days.</p>	<p>construction workers to be affected, as detailed below. In general, however, the potential for construction workers to be affected by the fatigue management requirements is more limited than suggested by the comment.</p> <p>The majority of construction workers building new reactors will not be subject to the fatigue management requirements of Subpart I of 10 CFR Part 26, because this portion of the rule does not apply to individuals who are constructing new reactors, unless fuel assemblies have been received at the site (see 10 CFR 26.3(c) and definitions under 10 CFR 26.5, as applicable). As reflected in the final rule's SOC for 10 CFR 26.3(a), the 10 CFR Part 26 requirements that apply to a licensee operating a nuclear power plant are not warranted during nuclear power plant construction until fuel arrives on site when radiological risks will increase. Moreover, even at sites where the fatigue management provisions are applicable (i.e., at operating reactors and at new reactor construction sites when fuel assemblies are received), construction workers will be affected only in the ways described in the following paragraphs.</p> <p>Workers of any type who are granted unescorted access to the protected areas of a nuclear power reactor are covered by 10 CFR 26.203, "General Provisions" (e.g., the workers would have to be trained with respect to identifying symptoms of worker fatigue and contributors to decreased alertness in the workplace). These general provisions apply to permanent licensee employees, temporary workers during outages, and new reactor construction workers when fuel assemblies are received, but only if the individuals have unescorted access to protected areas (see 10 CFR 26.5 for the definition of protected areas).</p> <p>A smaller subset of workers who are granted unescorted</p>

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		<p>access to the protected areas of a nuclear power reactor also are subject to the work-hour controls in 10 CFR 26.205 if they perform one of the covered duties specified in 10 CFR 26.4(a)(1) through 10 CFR 26.4(a)(5). One of these covered duties is “maintenance or onsite direction of the maintenance of SSCs that a risk-informed evaluation process has shown to be significant to public health and safety.” Construction workers who perform such duties and who have been granted unescorted access will be covered by the work-hour controls.</p> <p>However, with respect to any of the temporary full-time outage workers mentioned in the comment who may be affected (i.e., based on their duties and access status), it is worth noting that the NRC considered the issues raised by the comment when developing the final rule and included adjustments allowing longer work hours for individuals performing covered maintenance activities. The most notable adjustment (given the issues raised in this comment) is that 10 CFR 26.205(d)(4) relaxes the MDO requirements for individuals performing covered maintenance during the first 60 days of an outage, to a minimum of 1 day off in any 7-day period. As a result of these adjustments, the NRC staff believes that the concerns raised by the commenter have been greatly reduced.</p> <p>Because the commenter’s exemption request seeks to exempt an entire class of individuals from the 10 CFR Part 26 fatigue management requirements, the commenter is essentially requesting that the NRC revise the 10 CFR Part 26 requirements as they apply to these individuals. Such a request is more appropriately submitted through a petition for rulemaking under 10 CFR 2.802, “Petition for Rulemaking.”</p>

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Dominion Resources Services Comments		
35	<p>Endorsement of Revision 1 to NEI 06-11</p> <p>Comment: Many times in the Draft Regulatory Guide the NRC either endorses or references Revision E of NEI 06-11, with the corresponding date and ADAMS number. Since the issue date of the Draft Regulatory Guide, the latest version of NEI 06-11 is now at revision 1.</p> <p>Recommendation: It is suggested that the revision number and date for NEI 06-11 be changed in the text of the Draft Regulatory Guide to Revision 1 with the date of October 2008.</p>	The NRC agrees with this comment and has made the requested changes throughout the final regulatory guide.
Union of Concerned Scientists Comments		
36	<p>Regulatory Position 6—Eligibility for Outage Minimum Days Off</p> <p>The commenter objected to industry concerns that the work hour limits for control room operators at multiple unit sites having at least one reactor operating and at least one reactor in an outage are too onerous. The commenter argued that safety should trump inconvenience and stated that the NRC staff had appropriately balanced safety and economics in the final rule. The commenter also included four enclosures supporting the need for these work hour limits. The commenter argued that these documents show the following:</p> <ul style="list-style-type: none"> • The Three Mile Island accident involved an operating reactor adjacent to a reactor in the latter stages of a refueling outage (NUREG/CR-1496). • Workers on the operating reactor at the time of the accident 	The NRC staff agrees that, at a minimum, those individuals who constitute the operator minimum shift complement, including the operator at the controls and the senior operator in the control room, as specified in 10 CFR 50.54, for the operating unit at a multiunit site with one or more units in an outage should not work the longer work hours that the rule permits for outages because these individuals' primary duties are to ensure the safe operations of the operating unit. Regulatory Position 1 in the final regulatory guide revises the guidance in NEI 06-11, Revision 1, to reflect the staff's position.

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	<p>admitted to being too fatigued to perform assigned tasks (NUREG-0600).</p> <ul style="list-style-type: none"> • Since the Three Mile Island accident, the NRC has been concerned about fatigue impairing workers' performance and its detrimental effects on nuclear plant safety (NRC Circular No. 80-02). • Recent NRC data illustrate that human error rates are highest in the latter stages of refueling outages (Attachment 1 to NRC Information Notice 2000). 	

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Additional Comments from NEI		
37 NEI— December 24, 2008 letter	<p>NEI provided further discussion of its request (in Comment 10 in this table) for a 6-month period of enforcement discretion for the fatigue management provisions of 10 CFR Part 26. The points raised include the following:</p> <ul style="list-style-type: none"> • Additional time will be needed to finalize software packages for tracking the work-hour restrictions of the rule after publication of the final regulatory guide. NEI noted that publication of the final regulatory guide in May 2009 will allow only 4 months for making any necessary modifications before the fatigue management requirements must be implemented, there are limitations on the resources of vendors coordinating and scheduling software installation at many sites, and time will be required to test the software and train personnel to use it. • Licensees need to recruit, evaluate, and train increased staff (e.g., a 20-percent increase in security staffing across the industry) to implement the rule. <p>There may be potential schedule impacts on fall 2009 outages from the need to ensure that there are sufficient reactor operators and senior operators to maintain some operators on nonoutage hours for operating units at multiunit sites; and</p> <ul style="list-style-type: none"> • Granting a 6-month period of enforcement discretion will not adversely affect public health and safety and will allow for a more consistent implementation of the rule. 	The NRC staff is evaluating this request for enforcement discretion.
38 NEI— December 24, 2008, letter	NEI also recommended that, during the 6-month period of enforcement discretion, the industry working group and the NRC staff should collect lessons learned and revise NEI 06-11, “Managing Personnel Fatigue at Nuclear Power Reactor Sites,” as appropriate, to ensure more consistent implementation of the	The NRC’s procedures include a process and criteria for revising regulatory guides. The questions to be answered in determining whether to revise a guide include: Does the current regulatory guide represent a method that is no

Comment from	Comment	NRC Staff Disposition
	rule requirements.	<p>longer acceptable for meeting the regulations?</p> <p>Would the revision improve efficiency, improve effectiveness, or reduce burden for the staff or licensees and applicants?</p> <p>If the revision is not needed to meet a new regulation, rule, or order, or is not required to adequately protect public health and safety, would the benefits of the proposed revision outweigh the costs (both agency costs and industry costs) of making the revision?</p> <p>Lessons learned from implementing the final regulatory guide would provide information to the NRC staff needed to answer these questions and determine whether a future revision is warranted.</p>