

# NRC Staff Comments on NEI 06-11, Rev. D, Managing Personnel Fatigue at Nuclear Power Reactor Sites

## General Comments

Consider further technical editing of the guidance document to correct minor typographical and formatting errors that are not captured in this set of comments.

## Executive Summary (page i)

The text in this section does not provide sufficient information summarizing the actual content of the guidance document. The staff recommends adding more descriptive text to the executive summary.

## Section 1 Introduction (page 1)

The introduction states, “An individual’s ability to safely and competently perform his or her duties is not solely based on the individual’s hours worked or that the individual has had adequate rest.” Further, the introductory section identifies a number of additional cognitive impairments and causal factors that may affect individual performance (e.g., sleep disorders, stress, circadian variations). The introduction could be improved by including a discussion of how the guidance document addresses these issues. The introduction also appears to present several loosely related issues. The introduction may benefit from a discussion of how these issues are related or how fatigue management provides a comprehensive and integrated means for addressing these issues.

## Section 3 Definitions

### Definition of Directing (page 5)

The staff recommends revising the definition of **directing** on page 5 for consistency with rule language, as follows (the underlined text has been added):

**Directing** means the exercise of control over work activity by an individual who is directly involved in the execution of the work activity ~~and~~ or is ultimately responsible for the correct performance of that work activity.

### Definition of Work Hours (page 6)

The word “an” before “unannounced emergency preparedness exercises” in the last bullet on page 6 should be deleted.

## Section 5.2 Procedures

### Spacing Error (page 8)

The spacing error between items 1 and 2 on the bottom of page 8 should be corrected.

### General Manager Responsibilities (page 9)

1. The staff recommends adding the underlined text to item 3, 2<sup>nd</sup> bullet, for clarity:

Evaluating the performance of individuals to ensure individual work schedules prevent impairment from fatigue. This includes evaluating the duration, frequency and sequencing of the work hours that are worked by each individual relative to worker performance.

2. The staff recommends including guidance that addresses responsibility for corrective actions that may be identified through the annual review.

## **Section 6.2 Work Hour Controls for Covered Individuals**

### Exclusion of Predictive Maintenance (page 12)

The guidance on page 12, 3<sup>rd</sup> bullet, discusses the exclusion of certain predictive maintenance activities from covered maintenance work given that those activities do not result in a change of condition or state of a structure, system, or component (SSC). As indicated in a letter to NEI, dated April 10, 2008, the staff's position is that predictive maintenance activities that are required by technical specifications should not be part of this exclusion. The guidance in this section should be revised accordingly.

## **Section 6.3 Directing**

### Definition of Directing (page 13)

The guidance on page 13 regarding the definition of directing should be revised consistent with previous comment on Section 3, Definitions.

## **Section 7 Work Hours Scheduling**

### Scheduling Criterion (page 17)

The guidance on page 17 includes a list of scheduling criteria that would ensure scheduling practices consistent with the performance objective of the rule. As indicated during the public meeting, held on February 21, 2008, the staff recommends adding, as a separate scheduling criterion, "minimization of unscheduled overtime." The staff's position is that for adhering to the concept of long-range predictability, the adverse effects of unscheduled overtime should be considered as part of the scheduling process (e.g., by using self-relieving crews).

### Additional Work Hours (page 18)

The guidance included in the first paragraph on page 18 uses the terms "additional work hours," "excessive work hours," and "on average." The staff recommends that these terms be clarified in the context of the following questions:

- Are the "additional work hours" considered relative to a base schedule or MDO requirements?
- What does "on average" mean relative to "excessive work hours?"

## **Section 7.1 Periodic Overtime**

(Discussed in email to NEI, dated June 13, 2008)

## **Section 7.2 Transitions between Schedules**

### Periodic Overtime (page 19)

The staff recommends deleting the second sentence in the first paragraph on page 19.

## **Section 7.4 Transitioning between Covered Groups or into a Covered Group** (page 20)

(Discussed in email to NEI, dated June 13, 2008)

## **Section 7.5 Unexpected Outages** (page 21)

1. The staff recommends moving the guidance contained in Section 7.5 to Section 8, Managing Hours Worked.
2. The staff recommends replacing the text “normal operations” in the second sentence of the first paragraph of Section 7.5 with “non-outage periods” for consistency with the rule text.

## **Section 7.6 Reset From Deviations** (page 22)

The guidance in this section should be clarified to indicate that deviations from the requirements of the rule could potentially constitute violations of those requirements.

## **Section 8.1 Calculating Hours Worked**

### Average Days Off/MDO (page 24)

The guidance in item (c) on page 24 uses the phrase “average days off.” The staff recommends replacing “average days off” with “minimum days off” (MDO) for clarity and consistency with other parts of the guidance document. To distinguish between the requirements in Section 26.205(d)(3) and those in (d)(4) or (d)(5), the staff recommends “operating MDO” and “outage MDO” as potential alternatives.

### Assigning Additional Hours and MDO (page 25)

The staff recommends adding a bullet in the list at the top of page 25 to indicate that the effects on MDO should be considered before assigning additional work.

### Call-in Work Period (page 26)

(Discussed in email transmitting this attachment)

### Daylight Savings Time (page 26)

The language in the guidance on page 26 regarding daylight savings time should be clarified with respect to a shift, not an entire day. The staff recommends revising the text in the last two paragraphs on page 26 as follows (the underlined text has been added):

When working during the change from standard time to daylight savings time, the day shift being worked during the time change may be counted as a 7-hour, 9-hour, or 11-hour day shift.

When working during the change from daylight savings time back to standard time, the day shift being worked during the time change may be counted as an 8-hour, 10-hour, or 12-hour day shift (i.e., the additional hour does not have to be included in the work hour calculations).

#### Incidental Duties Performed Off-Site (page 28)

The last sentence in the answer section of Example 1 on page 28 should read, “The individual could begin work at 0900 the next day.” (The underlined text has been added.)

### **Section 8.2 Work Hour Controls during Normal Operations**

#### Section Titles (pages 29-30)

The staff recommends replacing the phrase “normal operations” contained in the title of Section 8 and the first sentence of the same section on page 29 with “non-outage periods.”

#### Table Column Titles (page 30)

The title of the first column of the table on page 30 (and all related tables) should be changed to “covered individual” since that is a defined term in Section 3, Definitions.

### **Section 8.3 Work Hour Controls during Outages**

#### Transitioning Into/Out of an Outage (page 30)

1. The guidance should be revised to remove discussion of the pre- and post-outage periods as periodic overtime.
2. The staff recommends that the guidance on page 30 include the following options for managing the transition into or out of an outage:
  - Using shift cycles of less than six weeks in length;
  - Changing shift duration;
  - Using a rolling 6-week average.

Once these options are included, the example on page 30 should be revised accordingly.

#### Examples of Unit Outage Activities (pages 31-33)

1. The third bullet on page 31 should read “emergent work that impacts the outage unit.” (The underlined text has been added.)
2. The information in bullets 11 (ERO) and 12 (fire brigade) on page 31 is covered in the last bullet on page 32. The staff finds this duplication unnecessary and recommends deleting bullets 11 and 12 on page 31.

3. Several bullets on page 32 repeat the phrase “outage unit and common systems.” With the new/revised defining statement in the paragraph leading to the list of outage activities on page 31, the staff considers this duplication to be unnecessary.

#### Workers Eligible to Work Outage Hours (pages 32-33)

(Discussed in email to NEI, dated June 13, 2008)

#### Controls of Work Hours During an Outage (pages 34-35)

1. The staff recommends revising the first sentence on the top of page 35 as follows (the underlined text has been added):

For an 8-hour shift, the operating ~~work hours~~ minimum day off requirements are less restrictive than the outage ~~work hours~~ minimum day off requirements.

2. The text in the answer section of the second example on page 35 should be clarified to indicate that an extension to outage controls cannot go beyond the end of an outage.

#### Security System Outages and/or Increased Threat Conditions

As discussed in the email of June 13, 2008, the guidance in NEI 06-11, Revision D, does not address the exceptions for security personnel contained in § 26.205(d)(5) with respect to security system outages and/or increased threat conditions. The guidance defines and refers to the term “unit outage” generically and it remains unclear whether the various portions of the guidance document apply (or not) to security personnel under those conditions.

The staff recommends clarification of relevant sections in the guidance document with respect to security system outages and/or increased threat conditions. Further, consistent with this objective, the guidance should mention the exception contained in § 26.205(d)(5):

(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.

### **Section 9 Waivers**

#### Use of a Check Box for Supervisory Assessment (page 36)

The guidance on page 36, item 3, 2<sup>nd</sup> bullet, allows for the use of a check box to indicate a criterion was considered as part of a supervisory assessment without requiring supervisors to document the actual conditions (e.g., actual number of hours worked, the individual’s recent shift schedule, time of day work will be done) relative to each criterion. As indicated in NRC staff comments communicated to NEI on February 14, 2008, the staff’s position is that only checking a box for each area considered is not sufficient for documenting the basis of the decision as to whether a waiver should be granted or denied. The staff recommends revision of the guidance contained in item 3 on page 36 consistent with this comment.

### Granting Waivers (page 37)

1. The spacing error between items 1 and 2 on page 37 should be corrected.
2. The last sentence of item 3 on page 37 should be revised as stated below (the underlined text has been added):

The supervisor, if qualified, can be a second level supervisor or a manager in the chain of command.

### **Section 10 Personnel Actions** (page 39)

1. The discussion of “refusal” of individuals to submit to a fatigue assessment (second to the last paragraph on page 39) should be separate from the discussion of “facts to be considered” in assessing disciplinary action.
2. The second sentence in the second to the last paragraph on page 39 should be revised as stated below (the underlined text has been added):

Facts to be considered in assessing disciplinary action shall include the employee’s job assignment ~~and~~, past work record, and work schedule.

### **Section 12 Fatigue Assessments** (page 41)

#### Introductory Text (page 41)

The staff recommends adding introductory text to Section 12 describing the purpose of fatigue assessments and thus clarifying the difference between “fatigue assessments” and the supervisory assessments required for “waivers.”

#### Section Organization and Titles (pages 41-43)

The staff recommends including subsection titles and reorganizing Section 12.1 to better reflect the content of this section. Specifically, the staff proposes the inclusion of the following title for subsections in Section 12.1 of the guidance document (suggested new subsection titles are shown in italics):

- *Conditions for Conducting Fatigue Assessments*  
→ Rev. D text from item 1 on page 41
- *Individuals Conducting Fatigue Assessments*  
→ Rev. D text from item 2, paragraphs a and b on pages 41-42
- *Necessary Information*  
→ Rev. D text from item 2\*, paragraphs a, b, and c on page 42
- *Assessment and Actions*  
→ Rev. D text from items 3 and 4 on page 42
- *Documentation*  
→ Rev. D text from items 5 and 6 on pages 42-43

\* There is a numbering error in the current guidance document as item 2 appears on both pages 41 and 42.

#### Supervisory Assessment (page 43)

1. The title should be revised to avoid confusion with the supervisory assessment required for waivers. The assessments may also be conducted by a staff member of the fitness-for-duty program. Therefore, a more generic title for the assessment may be appropriate.
2. The guidance on page 43, item 2, 3<sup>rd</sup> bullet, refers to the concept of using a check box for a supervisory assessment. The staff recommends revising this guidance consistent with previous comment included under Section 9, Waivers.

### **Section 15 Reviews**

#### Worker Performance (page 47)

The word “worker” was recently added to the existing first sentence of item 1 on page 47, Revision D of the guidance. This addition still links worker performance to consistency with the work hour controls rather than with the individual’s performance of his or her assigned work activities (e.g., notable human performance errors during the period). The topic on the review of individual job performance should be singled out as a separate numbered item and expanded with additional guidance on how to assess worker performance for the purposes of this section. For example:

- xx. Review worker job performance (e.g. error rates or other human performance measures collected by the licensee) with regard to the effects of the duration, frequency and sequencing of the work hours.

#### Overtime Use (page 48)

The staff recommends replacing the sentence under item f. on page 48 with the following (the underlined text has been added):

- Does the level and pattern of overtime utilized use supports a determination that staff size is appropriate for the schedule and work?