

July 2, 2002

MEMORANDUM TO: Theodore R. Quay, Chief  
Equipment and Human Performance Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation

FROM: David C. Trimble, Chief */RA/*  
Operator Licensing and Human Performance Section  
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Division of Inspection Program Management  
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SUBJECT: SUMMARY OF THE JUNE 5, 2002, PUBLIC MEETING TO DISCUSS  
THE DEVELOPMENT OF A PROPOSED WORKER FATIGUE RULE

On June 5, 2002, the staff held a public meeting to discuss development of a proposed rule concerning worker fatigue at nuclear power plants. The rulemaking has been proposed as an amendment to 10 CFR 26, "Fitness for Duty Programs." The meeting participants (see Attachment 1) included representatives from the Electric Power Research Institute (EPRI), the Nuclear Energy Institute (NEI), the Professional Reactor Operator Society, the National Sleep Foundation, individual utilities, and members of the public. The meeting agenda is contained in the staff's presentation materials provided as Attachment 2.

At the April 19, 2002, stakeholder meeting, NEI proposed to develop an industry fatigue management guidance document. In light of this proposal, the staff began the June 5th meeting by proposing that the framework to address worker fatigue consist of Part 26 requirements to specifically address worker fatigue, an industry guidance document for fatigue management in the nuclear industry, and a regulatory guide that would potentially endorse the industry guidance document. Participants at the meeting were in general agreement with this proposed framework and subsequent discussions during the meeting focused on the NEI guidance in this framework. NEI presented an initial draft of a proposed guidance document (Attachment 3) for managing and mitigating the risk of worker fatigue in the nuclear industry. The major elements of the NEI guidance are (1) program attributes and objectives, (2) scheduling attributes, and (3) education and training. Presentations by NEI of the guidance document were interspersed with NRC staff presentations of corresponding current and proposed Part 26 requirements. The basic elements of the proposed Part 26 requirements are (1) fatigue management controls (including measures for the prevention, detection, and mitigation of fatigue), (2) requirements for licensee monitoring of program performance, and (3) corrective action for inadequate program performance. The NRC staff's outline of the proposed requirements is provided as Attachment 4. Although the draft guidelines and requirements documents are organized differently, there was substantial agreement at the stakeholder meeting on the intended program objectives and specific program elements. Specifically, most

stakeholders were in agreement with a fatigue management approach that will have the objective of managing the risk of fatigue related events, that will address fatigue from any cause (not just work schedules), and which will use diverse methods (e.g., scheduling controls, education, behavioral observation) to achieve this objective.

The participants set July 17, 2002, as the date for the next public meeting. Participants agreed that the objectives for this meeting will be further definition of the scope of personnel that will be subject to the proposed requirements and to discuss and further define options for managing fatigue through work scheduling controls.

Attachments: As stated

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Attachments: As stated

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Public Meeting to Discuss Development of a Proposed Rule Concerning  
Worker Fatigue at Nuclear Power Plants

June 5, 2002

Attendance List

NAME	AFFILIATION
David Trimble	NRC
James Davis	NEI
Terry Matlosz	SCE&G
David Ziebell	EPRI
Craig Seaman	APS - Palo Verde
Ralph Mullis	Progress Energy
Gerald Ellis	EXELON Nuclear
Patrick Shaffer	Southern California Edison
Martin Humphrey	FENOC
Richard Eckenrode	NRC
James Bongarra	NRC
Shana Browde	NRC
Jenny Weil	McGraw-Hill
Susan Yim	Ballard, Spoles, Andrews & Ingersoll
Deann Raleigh	US Scientech
Sandra Frattali	NRC
Patricia L. Campbell	Winston & Strawn
Savrabh Desai	National Sleep Foundation
Darrell Droblich	National Sleep Foundation
Barry Quigley	Self
Marjorie Rothschild	NRC
Jennifer Dixon-Herrity	NRC
Henry J. McGurren	NRC/OGC
Chip Cameron	NRC/OGC

NAME	AFFILIATION
Martin Moore-Ede	Circadian Technologies
Steven Turren	PROS
Robert C. Evans	NEI
Clare Goodman	NRC/NRR
J. Persensky	NRC
David Desaulniers	NRC

**DEVELOPMENT OF DRAFT WORKER FATIGUE AMENDMENT**

**JUNE 5, 2002**

## **Proposed Regulatory Framework**

- **Amend Part 26 to address worker fatigue**
- **Regulatory guide for Part 26 fatigue requirements**
- **Industry guideline for fatigue management in nuclear industry**

Note: 10 CFR 26 is currently the subject of a separate, broader, rulemaking effort to revise fitness for duty requirements. Draft regulatory language has been substantively developed for that effort which shall be referred to in this documents as the “proposed revision of Part 26.” We have provided excerpts from the draft revision of Part 26 for two reasons: (1) to show how the proposed amendment to address worker fatigue might ultimately be integrated with the proposed revision to Part 26 and (2) to show how some of the proposed revisions to Part 26 may address worker fatigue. These excerpts are provided in the Reference section accompanying many of the proposed amendments to address worker fatigue

## Proposed Objective, Scope and Structure of Rule Amendment

### General Performance Objective:

FFD programs must . . . manage and mitigate the risk of events related to worker fatigue

### Scope

The proposed amendments to address worker fatigue shall apply to all personnel subject to the general requirements of Part 26 with the exception of the work scheduling controls which shall apply only to personnel performing functions important to plant safety

### Major Elements of Proposed Rule Amendment

- (1) controls to manage the risk of events related to worker fatigue,
- (2) monitoring of the effectiveness of the fatigue management controls, and
- (3) corrective actions as necessary.

## Organization of Document

### Section 1: Controls for managing risk of fatigue related events:

- Prevention (p. 1)
- Detection (p. 4)
- Mitigation (p. 6)

### Section 2: Monitoring the effectiveness of fatigue management controls

- Root cause assessment of incidents (p. 7)
- Periodic assessments of program performance (p. 8)

### Section: Corrective actions

- Link fatigue management program to corrective action program (p. 9)

## SECTION 1: CONTROLS - PREVENTION

### WORK SCHEDULING

#### (1) Controls for managing and mitigating the risk of events related to worker fatigue

(a) Licensee shall establish controls to prevent degraded alertness in personnel performing functions important to plant safety; These controls:

(a)(1) shall ensure that routine schedules do not require workers to exceed 12 hours/day, nor an average\* of 40 hours/week and

(a)(2) shall limit the work hours of plant personnel in accordance with the limits specified in Table 1.

Table 1.

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An individual shall not be permitted to work more than 16 hours straight.\*\*

An individual shall not be permitted to work more than 16 hours in any 24-hour period, nor more than 26 hours in any 48-hour period, nor more than 72 hours in any seven day period.\*\*

A break of at least 10 hours shall be allowed between work periods (including turnover).

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\* The average number of hours per week shall be calculated over a period not to exceed six weeks

\*\* Limits exclude no more than 1 hour of shift turnover. No time for activities other than shift turnover (e.g., breaks) is excluded.

**Proposal:** Incorporate above controls within Part 26 section concerning procedures

**Reference:** Draft revision of Part 26, Section 26.23(c), "Procedures" requires "written procedures that describe the methods to be used in implementing the FFD policy and the requirements of this part."

## SECTION 1: CONTROLS - PREVENTION

### TRAINING

**(a)(2) Persons subject to the requirements of this Part shall be provided with training to ensure that they understand:**

- (1) the effects of fatigue on performance**
- (2) effective strategies for obtaining healthy sleep**
- (3) the indications and risk factors for common sleep disorders (and the availability of facilities for assessment and treatment)**
- (4) behavioral observation methods appropriate for the detection of personnel impaired by fatigue**
- (5) practical measures to identify and mitigate task and environmental factors that induce decreased alertness**
- (6) the efficacy and appropriate use of common fatigue countermeasures**

**Proposal:** Incorporate within 26.25(a), "Content of Training"

**Reference:** Draft revision of Part 26, Section 26.25(a) requires licensees to "ensure that individuals assigned to perform activities within the scope of this part have mastered the knowledge, skills and abilities (KSAs) required to implement their responsibilities under the FFD policy. Mastery is demonstrated by passing a comprehensive examination." The section subsequently lists specific learning objectives.

## SECTION 1: CONTROLS - PREVENTION

### SLEEP DISORDER SCREENING

#### (a)(3) Sleep disorder screening

##### For licensed operators:

**Proposal:** Revise RG 1.134 “Medical Evaluation of Licensed Operators at Nuclear Power Plants to add an exception to Section C, Regulatory Position,” to reference sleep disorders

**Reference:** 10 CFR 55.21 requires a medical examination for operator license applicants to determine that their medical condition and general health will not adversely affect their ability to perform licensed duties. A licensed operator is required to have a medical examination every 2 years

##### For other personnel subject to Part 26 requirements

**Proposal:** Other proposed and existing requirements provide a means to address sleep disorders for personnel not covered under the medical evaluation requirements for licensed personnel.

(1) The staff has proposed a training requirement which would require all personnel subject to the requirements of Part 26 to receive training concerning sleep disorders.

(2) The behavioral observation program would provide a mechanism for identifying persons afflicted by sleep disorders through a performance basis. (3) The assessment process proposed as Section 26.28 (see item 1(b)(2)) would provide a process for referral to appropriate diagnosis/treatment.

**Reference:** Draft revision of Part 26, Section 26.29, “Behavioral Observation” states that “licensees must assure that **individuals performing activities under this part are subject to behavioral observation by observers trained to detect** possible possession, use or sale of illegal drugs, possession of alcohol on-site, or **impairment that, if left unattended, may constitute a risk to the health and safety of the public.** Individuals assigned to perform activities within the scope of this part must report fitness concerns to the licensee or C/V personnel designated in the FFD policy as responsible for arranging for a determination of fitness.

## SECTION 1: CONTROLS - DETECTION

**(b) Licensees shall establish and implement controls to detect personnel who are unfit because of fatigue or degraded alertness and procedures for implementing appropriate corrective action**

### BEHAVIORAL OBSERVATION

#### **(b)(1) Behavioral Observation**

**Proposal:** Draft revision of Part 26, Section 26.29, "Behavioral Observation" may be adequate as written.

**Reference:** Draft revision of Part 26, Section 26.29, "Behavioral Observation" states that "licensees must assure that individuals performing activities under this part are subject to behavioral observation by **observers trained to detect** possible possession, use or sale of illegal drugs, possession of alcohol on-site, or **impairment that, if left unattended, may constitute a risk to the health and safety of the public.** Individuals assigned to perform activities within the scope of this part must report fitness concerns to the licensee or C/V personnel designated in the FFD policy as responsible for arranging for a determination of fitness.

### ASSESSMENT

#### **(b)(2) For-cause assessment of fatigue**

**Proposal:** Add a Section 26.28, "Fatigue Assessment" to define the conditions requiring assessment, the necessary characteristics of the assessment, and follow-on actions.

**Reference:** Draft revision of Part 26, Section 26.27, "Drug and Alcohol Testing" requires drug and alcohol testing . . . in response to any observed behavior or physical condition that creates a reasonable suspicion of possible substance abuse.

### SCREENING

#### **(b)(3) Screening of call-ins**

**Proposal:** The proposed requirement in draft revision of Part 26, Section 26.23(c), "Procedures" Item 3 appears adequate as written.

**Reference:** Draft revision of Part 26, Section 26.23(c), "Procedures" Item 3 requires "a statement to be made by a called-in person as to **whether he or she considers himself or herself fit for duty** and whether he or she has consumed alcohol within the pre-duty abstinence period stated in the policy;"

## SECTION 1: CONTROLS - DETECTION

### SELF-DECLARATION

#### **(b)(4) Self-declaration while on-duty**

**Proposal:** Add an Item 5 to require a process to be followed if an individual declares they are unfit while on-duty.

**Reference:** Draft revision of Part 26, Section 26.23(c), "Procedures", Item 4 requires that licensee procedures "Describe the process to be followed if an individual's behavior raises a concern regarding possible possession, use or sale of illegal drugs, possession of alcohol on-site, or impairment of any kind that may constitute a risk to the health and safety of the public."

## SECTION 1: CONTROLS - MITIGATION

### MITIGATION

**(c) mitigate the adverse effects of worker fatigue on the performance of tasks important to plant safety.**

**Proposal:** Propose adding a requirement to address circumstances in which it may be necessary to use personnel in excess of work hour limits or in circumstances involving increased potential for fatigue-induced impairment.

**Reference:** Draft revision of Part 26, Section 26.23(c), " Procedures" Item 3 states that "Consumption of alcohol during the abstinence period shall not by itself preclude a licensee from using individuals needed to respond to an emergency. At a minimum, . . .the procedure must. . .Require the establishment of controls and conditions under which the individual who has been called-in can perform work, if necessary."

## SECTION 2: MONITORING

### (2) Monitoring the effectiveness of the fatigue management controls.

#### ROOT CAUSE ASSESSMENT

**(a) Licensees shall establish procedures to ensure that root cause assessments for events involving human performance include an assessment of fatigue as a potential causal factor**

**Proposal:** Create a section 26.28, "Fatigue assessment," that establishes requirements for assessing the contribution of fatigue as an event causal or contributing factor for specified circumstances. As noted for proposed requirement 1(b)(2), this requirement would also define the necessary characteristics of the assessment, and follow-on actions.

**Reference:** Draft revision of Part 26, Section 26.27, "Drug and alcohol testing", Item B "Conditions for testing," requires "drug and alcohol tests under the following conditions: . . .

(2) In response to any observed behavior or physical condition that creates a reasonable suspicion of possible substance abuse;

(3) As soon as practical after accidents involving a failure in individual performance that resulted in:

(i) a significant personal injury, such as an injury that requires medical treatment and results in lost work time, if there is a reasonable suspicion of possible substance abuse,

(ii) a radiation exposure or release of radioactivity in excess of regulatory limits, or

(iii) actual or potential substantial degradations of the level of safety at the plant if there is reasonable suspicion that the individual's performance contributed to the event;

## SECTION 2: MONITORING- PERIODIC ASSESSMENTS

### PERIODIC ASSESSMENTS

**(b) Licensees shall conduct periodic assessments of the effectiveness of their controls for the prevention, detection, and mitigation of the risk of events related to worker fatigue. As a minimum, licensees shall monitor their performance in meeting the following objectives:**

**(1) the average number of hours worked in any 12 month period (by individuals performing the same job function) less than 2300 hours**

**(2) the total number of hours worked by an individual in any 12 month period less than 2600 hours**

**(3) the incidence of human performance related events during deviations from routine schedules not greater than the rate of such events during routine work hours**

**Proposal:** Incorporate above requirements in Part 26 section concerning audits and corrective action.

**Reference:** Draft revision of Part 26, section 26.37, "Audits and Corrective Action" state that . . . "Each licensee subject to this part is responsible for the continuing effectiveness of the FFD program . . . **Each licensee shall ensure that audits of these programs are conducted** and that corrective actions are taken to resolve any problems identified.

### SECTION 3: CORRECTIVE ACTION

#### (3) develop and implement corrective actions as necessary.

**Proposal:** Incorporate a requirement for corrective action for instances of licensees not meeting program objectives described in proposed requirement 2(b), "Periodic Assessment."

**Reference:** Draft revision of Part 26, section 26.37, "Audits and Corrective Action" state that . . . "Each licensee subject to this part is responsible for the continuing effectiveness of the FFD program . . . Each licensee shall ensure that audits of these programs are conducted and that **corrective actions are taken to resolve any problems identified.**"