



Implementation of Part 26

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Speakers and Topics

- Opening: Bill Borchardt, EDO
- Introduction: Eric Leeds, NRR
- Fatigue Science:
 Dr. David Desaulniers, NRO
- Inspection of Licensee
Implementation:
 Kriss Kennedy, Region 4
- Next Steps: Fred Brown, NRR

Agenda

- Fatigue Science
- Observations from the Regions
- Proposed Alternative and Next Steps

Fatigue Management : The Science Behind the Rule and Its Relationship to the Interim Approach

Dr. David Desaulniers, Ph.D.
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Overview

- Development of the Rule and the Role of Fatigue Science
- Fatigue Science
- Cumulative Fatigue Management

Rule Development

- Key Considerations
 - Studies of fatigue and performance
 - Scope of job functions to cover
 - Operational practices and constraints
 - State-of-the-art practices
 - Integration and consistency of requirements

Rule Development



Fatigue Science

- Fatigue
 - defined in Part 26 is the degradation in cognitive and motor functioning resulting from inadequate rest
 - experienced subjectively as sleepiness, irritability, difficulty in concentrating
 - has a physiological basis with potential health consequences

Fatigue Science

- Two-process model of sleep regulation
 - Circadian Process
 - Sleep Homeostatic Process
- Interaction of these 2 processes is widely accepted as describing propensity for sleep or wakefulness

Fatigue Science

- Circadian Process
 - Represents a nearly 24-hour oscillatory variation in the propensity to sleep
 - Circadian rhythmicity observed in a wide range of physiological and cognitive measures

Fatigue Science

- Sleep Homeostatic Process
 - Represents a drive for sleep that increases progressively during wakefulness and decreases progressively during non-REM sleep

Cumulative Fatigue

- Cumulative Fatigue – the increase in fatigue over consecutive sleep-wake periods resulting from inadequate rest

Cumulative Fatigue

Cumulative Fatigue

- Caused by
 - early start times - shorten recovery sleep
 - shiftwork - reduces sleep quantity and quality
 - consecutive long work days and work weeks
- Without time off, people sacrifice sleep to meet daily living obligations

Cumulative Fatigue

- Prevention
- Mitigation
- Compensatory Measures

Inspection of Licensee Implementation of Fatigue Management Rule

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Region IV

Overview

- Inspection of Fatigue Rule
- Inspection Results and Observations

Inspection Program

- Manual Chapter 2515, Appendix D, "Plant Status"
- Inspection Procedure 71111.20, "Refueling and Other Outage Activities"
- Inspection Procedure 71130.08, "Fitness for Duty Program"
- Inspection Procedure 93002, "Managing Fatigue"

Inspection Program

- Objectives of Inspection
 - Maintain awareness of situations that may result in increased fatigue
 - Review of waivers, self-declarations and fatigue assessments
 - Verify outage work schedules comply with rule
 - Verify compliance with rule for security force personnel
 - Provide inspection guidance for evaluation of issues related to Subpart I

Inspection Results

- Few violations since October 2009
- Limited or no use of waivers at most sites
- Some examples of large reliance on waivers due to low staffing within a specific work group

Observations

- Feedback from plant personnel mixed
 - Positive feedback
 - Less forced overtime
 - Less fatigue during outages
 - Negative feedback
 - Less available overtime resulting in loss of pay
 - More unwanted overtime
 - Change in outage shift schedule caused more fatigue
 - Increased administrative burden on supervisors to manage work hours

Observations

- No direct impact on safety
- Some examples of extended work evolutions
- Multiple reports of increase in burden on supervisors
- Reduction in beneficial practices

Next Steps

Fred Brown, Director

Division of Inspection and Regional
Support

Office of Nuclear Reactor
Regulation

Next Steps

- Interim Approach
- Expand Existing Rulemaking Activity
- Continue to Assess Effectiveness

Interim Approach

- Alternative to Non-outage Minimum Days Off
- 54-hour per week average over a rolling period of up to six weeks
 - Would limit work hours to levels comparable to Part 26 MDO requirements for most workers

Authorizing Interim Approach

- Direct Final Rulemaking
- Exemptions
- Orders
- Confirmatory Orders
- Interim Enforcement Policy

Rulemaking

- Expand existing Rulemaking
- Address all Current Petitions on Minimum Days Off Provisions
- Leverage Existing Technical Basis

On-going Assessment

- Obtain Comments from broad group of stakeholders
- Meet Regularly with Industry on effectiveness of Interim Approach
- Continue to gather operational data