Fatigue Management
and
Part 26, Fitness for Duty Programs

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Background

- 1982 NRC establishes policy on work fatigue
- 1999 An SRO petitions NRC to establish enforceable work hour limits for safety-related duties
- 2001 Staff reviewed adequacy and implementation of worker fatigue policy
- 2002 Commission approved rulemaking plan for reactors
- 2002 – 2005 NRC conducts 16 public meetings on draft requirements
- 2005 NRC publishes proposed rule
- 2006 Staff incorporates public comment in draft final rule
- 2007 Commission affirms draft final rule
Worker Fatigue Incidents/Issues (Since 2000)

• 5 operators sleeping
• 1 STA inattentive
• 10 security guards sleeping
  – 2 instances of guards driving into barriers
  – 2 instances of both guards at a post sleeping
• 1 Chemistry technician sleeping
• 4 instances of inadequate OT control
• Continued self-declaration concerns
Fatigue Degrades Critical Skills and Abilities

- Attention
- Grammatical Reasoning
- Communications
- Decision making
- Teamwork
- Learning
Fatigue degrades fitness for duty
Contributors to Fatigue

Scheduling Factors
- Rotating shift schedules
- Long work days
- Early start/wake times
- Unscheduled overtime
- Extended periods of long work days without days off

Staffing Factors
- Highly variable workload
- Ageing work force

Task Factors
- High vigilance demands
- Low physical activity
- High attention to detail and cognitive demands
Limitations of Current Regulatory Framework
(NRC Policy Statement and Unit Tech. Specs.)

• Undefined terms and advisory language
• Use of waivers not clearly limited
• Cumulative fatigue not effectively addressed
• Only addresses fatigue from work hours
Subpart I, Managing Fatigue

Major Provisions

• Work Hours Scheduling
• Work hour limits and break requirements
• Periodic performance-based assessments
• Training
• Self-declaration
• Behavioral Observation
• Fatigue assessments
• Annual reporting
Work Hour Controls

- Work Hour Controls for:
  - Maintenance (Risk-significant only)
  - Operations (Risk-significant only)
  - Chemistry (Emergency Response only)
  - Health Physics (Emergency Response only)
  - Fire Brigade
    - (only workers responsible for knowing effects of fire & suppressants on safe shutdown capability)
  - Security Force (not including admin. workers)
  - Individuals who direct risk-significant maintenance & operations
Work Hour Limits and Break Requirements

• Retain max. work hour limits of 16 hours in any 24-hour period, 72 hours in any 7-day period
• Increase max. work hours in any 48-hour period from 24 to 26 hours
• Increase min. break period between work periods from 8 hours to 10 hours
• Limit waivers to conditions necessary to prevent or mitigate conditions adverse to safety or security
Minimum Day Off Requirements
(Normal Operations)

Vary according to:

- Plant state (operating or outage)
- Shift duration (8, 10, or 12-hours)
- Job duties
  - maintenance
  - operations, health physics, chemistry, fire brigade
  - security
Minimum Day Off Requirements
(Normal Operations)

• In each shift cycle, an average of:
  – 1 day off/week for 8-hour shifts
  – 2 days off/week for 10-hour shifts
  – Number of days off/week for 12-hour shifts
    • maintenance: 2
    • operations, hp, chemistry, fire brigade: 2.5
    • security: 3

• Days off must be distributed to provide at least 1 day off in any 9-day period
Minimum Day Off Requirements (Plant Outages)

- Maintenance: 1 day off in any 7-days
- Operations, hp, chemistry, & fire brigade: 3 days off in each non-overlapping 15 day block
- Security: 4 days off in each non-overlapping 15 day block
Minimum Day Off Requirements
(Plant Outages)

• Individuals will be limited to 60 consecutive days of outage scheduling
  – 7 day extensions will be allowed for each 7-day period during outage individual works not more than 48 hours

• Individuals are subject to outage controls, “while working on outage activities”
Fatigue Management Training

- Specified knowledge and abilities requirements
  - Fatigue prevention, detection, mitigation
  - Awareness of sleep disorders
- Can be part of FFD training
  - Initial and annual refresher training
  - Annual examination
- Applicable to all personnel subject to the fitness for duty program requirements
Fatigue Assessments

- Fatigue Assessments
  - For-cause
  - Post-event
  - Follow-up
  - Self-declaration

- Applicable to all personnel subject to the fitness for duty program
“But I Don’t Wanna Work 7-12s!!”

Source: Nukeworker.com
Self-Declaration

A statement that you are not able to safely or competently perform your duties because of fatigue
Self-Declaration

• Requires that licensee procedures describe:
  – Rights and responsibilities
  – Controls and conditions for permitting or requiring individuals to perform work following a self-declaration
  – Process to be followed if an individual disagrees with the results of a fatigue assessment
Implementation

- Commission approved rule with limited changes
- Staff revising rule/package as directed by the Commission
- Industry developing implementation guidance
- NRC to endorse guidance through a Regulatory Guide
- NRC revising inspection guidance
- NRC developing electronic reporting capability for annual reports
- Staff anticipates publishing rule in first quarter 2008
- Full compliance with fatigue management provisions required within 18 months of publication
Worker training will be critical to achieving the full benefit of the fatigue management provisions

- Self-declaration
- Behavioral observation
- Effective fatigue counter-measures
- Shift-work lifestyle management
- Fatigue assessment
Questions?