



# Part 26 Rulemaking Public Meeting

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March 29 & 30, 2006  
Rockville, MD



# Welcome

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- Thank you for attending
- Opportunity for stakeholders
  - Exchange of views on staff proposed concepts to resolve public comments on proposed rule as published in *Federal Register Notice* (70 FR 50442)



# Introductions

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- Lead Project Manager: David Diec, (301) 415-2834, [dtd@nrc.gov](mailto:dtd@nrc.gov)
- Project Manager: Joe Birmingham, (301) 415-2829, [jl4@nrc.gov](mailto:jl4@nrc.gov)
- Worker Fatigue, Technical Lead: Dave Desaulniers, (301) 415-1043, [drd@nrc.gov](mailto:drd@nrc.gov)
- Drug and Alcohol, Technical Lead: Tim McCune, (301) 415-6474, [t5@nrc.gov](mailto:t5@nrc.gov)



# Meeting Agenda

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- March 29, 2006
  - FFD and AA for construction sites
  - Alternative work hour controls
- March 30, 2006
  - Implementation guidance for fatigue management provisions



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# FFD and AA for Construction Sites

Tim McCune, NSIR,  
Val Barnes, RES  
March 29, 2006



# Public Comments on Proposed Requirements

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- No risks to public health and safety until fuel arrives – industrial safety only
- Confusing cross-references to Parts 50 and 52
- Cross-references to other sections of the rule will impose all of the rule's requirements
- Performance objectives not applicable to construction sites
- Undue administrative burdens for audits and determinations of fitness



# Industry Proposal

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- Establish a drug-and-alcohol-free workplace policy, including sanctions
- Implement a pre-employment drug and alcohol testing program and a for-cause testing program
- Make provisions for the objective and impartial review of sanctions decisions, protection of information and recordkeeping



# NRC Staff Concerns

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- Protecting the common defense and security
- Preventing potential impacts on public health and safety from latent errors
- Scoping requirements commensurate with risk



# New Concepts for Construction Sites

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- Greater reliance on behavioral observation without random testing
- “Observers” subject to full FFD program
  - Supervisors and escorts
  - Security personnel
  - Reviewing officials
  - QA/QC auditors
- Non “observer” workers, with “unescorted access to the construction site” (more than 5 days/year) subject to modified FFD program



## “Flexible” Requirements under Modified FFD Programs

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- Sanctions to prohibit the individual from returning to work at the construction site until warranted
- Procedures for handling FFD concerns
- Procedures for recording and sharing FFD information about individuals
- Procedures for reviews of adverse FFD decisions
- “Observed” by those in full FFD program



# Administrative Requirements for Modified Programs

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- Modified program plans reviewed as part of licensing process
- FFD program performance reports
- Reports of significant FFD violations and programmatic failures
- Audits to ensure continued effectiveness
- Inspections



## Modified Programs

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- No FFD training
- No random testing (pre-access, for-cause, and post-accident only)
- No fatigue requirements
- No employee assistance programs
- No substance abuse experts



# Relationship to Proposed Subpart C Authorization Decisions

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- Self-disclosure and employment history
- Suitable inquiry
- Full reciprocity between modified programs, but not between modified and full programs (except for program elements that meet full requirements)
- Pre-access testing and FFD training required for authorization under Subpart C
- Determination of fitness in some cases



# Duration of Modified Programs

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- Beginning when “construction commences” §50.10(c)
- The term "commencement of construction" means any clearing of land, excavation or other substantial action that would adversely affect the environment of a site.
- Ending when the Commission grants permission to load fuel



# Manufacturing Licensees

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- Full FFD programs “when manufacturing commences”
  - Constructing a reactor
  - Stable workforce
  - Stable location



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# Questions & Comments



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# Subpart I

# Fatigue Management

## **Alternative Work Hour Controls Concept**

David Desaulniers, NRR  
J. Persensky, RES  
Tim McCune, NSIR  
March 29, 2006



# Public Comment

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- Broad support for most of the proposed fatigue management provisions
- Comments included requests/proposals to substantively change the requirements for:
  - Minimum 24-hour break in any 7 days
  - Minimum 48-hour break in any 14 days
  - Collective work hour limits
- Staff is evaluating comments on all fatigue management provisions



# Public Comment

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- **Requirement for a 24-hour break in any 7 days**
  - Would not provide flexibility necessary for 8-hour shift schedules
- **Requirement for a 48-hour break in any 14 days**
  - Would impact licensee ability to provide coverage for unplanned maintenance
  - Would adversely affect the circadian adjustment of individuals on night shift
- **Requirement for collective work hour limits**
  - Unnecessary, redundant with other requirements
  - Exemption period not long enough for extended outages
  - Not adequate, do not address fatigue on an individual basis
  - Calculations perceived as susceptible to manipulation



# Alternative Work Hour Control Concept

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- Delete requirements for
  - Minimum 24-hour break in any 7 days
  - Minimum 48-hour break in any 14 days
  - Collective work hour limits
- Replace with more flexible break requirements
  - Tailored to shift lengths
  - Controlled at individual level



# Alternative Break Requirements Part A

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- **Scope:** All individuals subject to work hour controls as described in proposed §26.199(a)(1-5)
- **Applicable:** While plant operating or shutdown
- **Break Requirement**
  - Individuals would be required to have a minimum of one 36-hour break in any 9-day period
- **Objective**
  - Prevent excessive consecutive work days for 8 or 10 hour shifts
- **Relevant Features**
  - Enables 8-hour shifts to schedule periods of 7 consecutive days, common to current schedules
  - Allows a “contingency day” when scheduling 7 consecutive days
  - Supports fixed shift or forward rotation of 8-hour shift schedules



# Example: Schedule 1

## 8-hour Shifts 6-week Rotation

	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Base	N	N	N	N	N			D	D	D	D	D					T	T	T	D	D	T			S	S	S	S	S	S	S			N	N
Proposed	N	N	N	N				D	D	D	D	D					T	T	T	D	D	T			S	S	S	S	S	S				N	N
Alternative	N	N	N	N	N			D	D	D	D	D					T	T	T	D	D	T			S	S	S	S	S	S	S			N	N



“Day” Off



Forced Day Off



Scheduled Work Day



# Example Schedule 2

## Combination 8-hour & 12-hour Shifts

### 6-week Rotation

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Day	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Base	T	T	T	T	T				D	D	D	D	A	A	D			N	N	P	P	N	N	N					R	R	R	R				S	S	S	S	S		
Proposed	T	T	T	T	T				D	D	D	D	A	A				N	N	P	P	N	N					R	R	R	R				S	S	S	S	S			
Alternative	T	T	T	T	T				D	D	D	D	A	A	D			N	N	P	P	N	N	N					R	R	R	R				S	S	S	S	S		



**“Day” Off**



**Forced Day Off**



**Scheduled Work Day**



# Alternative Break Requirements

## Part B

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- **Scope:** All individuals subject to work hour controls as described in proposed §26.199(a)(1-5)
  - **Applicable:** While plant is operating
  - **Break Requirements**
    - **8-hour shifts** – each individual receives an average of at least **one 24-hour break per week**, averaged over a shift cycle
    - **10-hour shifts** – each individual receives an average of at least **two 24-hour breaks per week**, averaged over a shift cycle
    - **12-hour shifts** – each individual receives an average of at least **three 24-hour breaks per week**, averaged over a shift cycle
  - **Objective**
    - Ensure routine schedules include adequate breaks to prevent cumulative fatigue
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# Alternative Break Requirements Part B

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- Relevant Features
  - Provide assurance each individual receives a minimum number of “days off”
  - Tailored to duration of shift individual works
  - Support flexible distribution of days off within a shift cycle
  - Accommodates, within limits, unscheduled work days



## Part B - Example 1

### 8-hour Shift 5-Week Rotation

	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S								
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Base	N	N	N	N	N	2 days		D	D	D	D	D	4 days	16 hrs			T	T	T	D	D	T	3 days		S	S	S	S	S	S	S	3 days		N	N	
Proposed	N	N	N	N		2 days	D	D	D	D	D	D	40 hr	D	2 days	16 hr	T	T	T	D	D	T	3 days		S	S	S	S	S	S		40 hr	S	2 days	N	N
Alternative	N	N	N	N	N	2 days		D	D	D	D	D	D	D	D	40 hr	T	T	T	D	D	T	2 days	S	S	S	S	S	S	S	S	2 days	N	N	N	



Scheduled Shift



"Day" Off



Unscheduled Shift



Forced Day Off



## Part B - Example 2

### 10-hour Shifts 5-Week Rotation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Base				N	N	N	N			A	A	A	A				T	T	T	T				A	A	A	A				A	A	A	A	
Alternative		N	N	N	N	N	N	4 8 hr		A	A	A	A	A	A	3 8 hr	T	T	T	T	A	6 2 hr		A	A	A	A	A	6 2 hr		A	A	A	A	7 3 hr



Scheduled Shift



Unscheduled Shift



“Day” Off



## Part B - Example 3

### 12-hour Shifts 5-Week Rotation

	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Base	4 days			N	N	N	24 h	T	T	T	T	3 days	15 hr		D	D	D	4 days			N	N	N	N	7 day							D	D	D	D	
Proposed	D	D	2 days	N	N	N	24 hr	T	T	T	T	2 days	15 hr	D	D	D	D	4 days			N	N	N	N	7 days							D	D	D	D	
Alternative	D	D	2 days	N	N	N	24 hr	T	T	T	T	2 days	15 hr	D	D	D	D	D	3 days			N	N	N	N	7 days							D	D	D	D



Scheduled Shift



Unscheduled Shift



“Day” Off



# Part B - Example 4

## Combination 8-hour & 12-hour Shifts

### 6-week Rotation

T = 8 hours training; A = 12 hour day shift; P = 12 hour night shift

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
Base	T	T	T	T	T	3 d	16 h		D	D	D	D	A	A	D	3 d	8 h	N	N	P	P	N	N	N	4 d				R	R	R	R	4 d			S	S	S	S	S	2 d	8 h
Proposed	T	T	T	T	T	A	2 d	8 h	D	D	D	D	A	A		4 d		N	N	P	P	N	N		N	3 d			R	R	R	R	R	3 d		S	S	S	S	S	2 d	8 h
Alternative	T	T	T	T	T	A	2 d	8 h	D	D	D	D	A	A	D	D	2 d 8 h	N	N	P	P	N	N	N	N	2 d		R	R	R	R	R	R	R	2d	S	S	S	S	S	2 d	8 h



Scheduled Shift



"Day" Off



Unscheduled Shift



Forced Day Off



# Alternative Break Requirements Part B

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- **Implementation Details**
  - Only breaks of 24 consecutive hours or more would count toward the break requirement
  - Breaks would be counted in 24-hour increments
  - Maximum duration of a shift cycle over which breaks could be averaged would be limited to 6 weeks
  - Schedules would be defined
    - 8-hour schedules would average not more than 9 hrs/day
    - 10-hour schedules would average not more than 10 hrs/day
    - 12-hour schedules would average not more than 12 hrs/day



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# Questions & Comments



# Alternative Break Requirements Part C

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- Relevant Features
    - Provides assurance each individual receives a minimum number of “days off”
    - Supports flexible distribution of days off within 15 day blocks
      - Minimize circadian disruption
      - Optimize work planning and control
    - Accommodates longer outage periods by allowing credit for periods of reduced work hours that may occur in extended outages
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# Alternative Break Requirements Part C-1

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- **Scope:** All individuals (except security) subject to work hour controls as described in proposed §26.199(a)(1-4)
- **Applicable:** While in a plant outage
- **Objective**
  - Ensure outage schedules include adequate breaks to prevent cumulative fatigue and maintain worker fitness for duty



# Alternative Break Requirements

## Part C-1

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- **Break Requirement**

- During the first 60 days of a plant outage, individuals would be required to have a minimum of 3 days off in each successive (i.e., non-rolling) 15 day period
- Beginning day 61 of a plant outage, each individual would be subject to the controls applicable to an operating plant, except as follows
  - Maximum 60 day period for application of outage controls could be extended 7 days for an individual or group of individuals for each independent 7-day period during the outage the individual or group worked not more than 48 hours



# Part C-1 Example 1

## Work Hour Control for Extended Outages

### Reduced Work Hour “Credit”

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	D	D	D	D		D	D	D	D		D	D	D	D		D	D	D	D		D	D	D	D		D	D	D	D	

Day	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	D	D	D	D				D	D	D	D				D	D	D	D		D	D	D	D		D	D	D	D		D

Day	61	62	63	64	65	66	67	68	69	70	71	72	73	74
	D	D	D		D	D	D	D		D	D	D	D	

\*The two weeks shown in blue, 31-44, form two 7-day periods that the individual or group worked not more than 48 hours. Therefore, individuals on this schedule can work under outage work hour controls for two weeks beyond day 60 (shown in green).



# Alternative Break Requirements Part C-1

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- Implementation Details
  - For any portion of a plant outage that does not comprise a complete 15 day period the following individual work hour limits of the proposed rule would apply
    - Not more than 16 hours in any 24-hour period
    - Not more than 26 hours in any 48-hour period
    - Not more than 72 hours in any 7-day period
    - A break of at least 10 hours between work periods
    - A minimum 36-hour break in any 9-day period



## Part C-1 Example 2 Fixed 12-hour Shifts Work Hour Control for Outage Periods < 15 Days

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	D	D	D	D	D	D		D	D	D	D	D	D			D	D	D	D	D	D		D	D	D	D	D	D		

Day	31	32	33	34	35	36	37	38	39	40	41	42
	D	D	D	D	D	D		D	D	D	D	D

- Days 31 – 42 do not comprise a 15 day period
  - Would not be subject to requirement for 3 days off
  - Would be subject to the following requirements
    - Not more than 16 hours in any 24-hour period
    - Not more than 26 hours in any 48-hour period
    - Not more than 72 hours in any 7-day period
    - A break of at least 10 hours between work periods
    - A minimum 36-hour break in any 9-day period



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# Questions & Comments



# Alternative Break Requirements Part C-2

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- **Scope:** All security individuals subject to work hour controls as described in proposed §26.199(a)(5)
  - **Applicable:** While in a plant outage, security outage, or increased threat condition
  - **Objective**
    - Ensure schedules during outages and increased threat conditions include adequate breaks to prevent cumulative fatigue and maintain security worker fitness for duty
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# Alternative Break Requirements

## Part C-2

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- **Break Requirement**
  - During the first 60 days of plant/security outage or increased threat condition individuals would be required to have a minimum of 4 days off in each successive (i.e., non-rolling) 15 day period
  - Beginning day 61, each individual would be subject to the controls applicable during plant operations, except
    - Maximum 60 day period could be extended 7 days for an individual or group of individuals for each independent 7-day period during the outage or increased threat condition the individual or group worked not more than 48 hours



# Alternative Break Requirements Part C-2

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- **Relevant Features**

- Provides assurance each individual receives a minimum number of “days off”
- Supports flexible distribution of days off within 15 day blocks
  - Minimize circadian disruption
  - Optimize work planning and control
- Accommodates longer outage periods by allowing credit for periods of reduced work hours that may occur in extended outages
- Consistent with Order 03-038 limiting security group average work hours to an average of 60 hours/week during plant outages, security outages, and increased threat conditions



# Alternative Break Requirements Part C-2

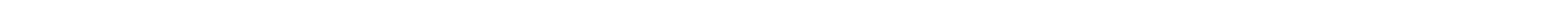
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- **Implementation Details**
  - For any portion of a plant outage, security or increased threat condition that does not comprise a complete 15 day period, the following individual work hour limits of the proposed rule would apply
    - Not more than 16 hours in any 24-hour period
    - Not more than 26 hours in any 48-hour period
    - Not more than 72 hours in any 7-day period
    - A break of at least 10 hours between work periods
    - A minimum 36-hour break in any 9-day period



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# Questions & Comments





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# Fatigue Management Guidance

J. Persensky, RES  
David Desaulniers, NRR

March 30, 2006



# Agenda

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- **Introduction**
- **Process for development of guidance**
- **NEI proposed guidance**
- **Work hour scheduling - 26.199(c)**
- **Managing hours worked (calculating hours and turnover)**
- **Fatigue assessment**
- **Collective work hours**
- **Discussion**
- **Summary and next steps**



# Process for Developing Guidance

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- **Stabilize rule**
- **NEI draft guidance proposal**
- **Stakeholder comment**
- **Draft Regulatory Guide endorsing NEI guidance**
- **Public comment**
- **Final Regulatory Guide**



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# NEI Proposal



# Work hour Scheduling 26.199(c)

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## Performance-based aspect of Part 26, Subpart I

- Non-outage scheduling
- Outage scheduling
- Scheduling criteria
- Thresholds for deviations from schedule
- Enforcement



# Managing Hours Worked

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- Calculating hours worked
- Turnover time



# Fatigue Assessment

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- Checklist



# Collective Work Hours

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- As needed



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# Questions & Comments



## Next Steps

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- Agreement on outline/content – based on Part 26, Subpart I outcome
  - Enhanced NEI draft
  - Stakeholder meeting
  - Draft Regulatory Guide
  - Public Comment
  - Final Regulatory Guide