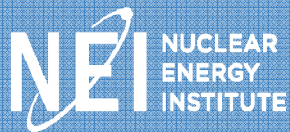


Industry Proposal 2 Smarter Program for Fuel Cycle Facilities

Bob Link, NEI Consultant

Janet Schlueter, NEI

November 15, 2019 at NRC



©2019 Nuclear Energy Institute

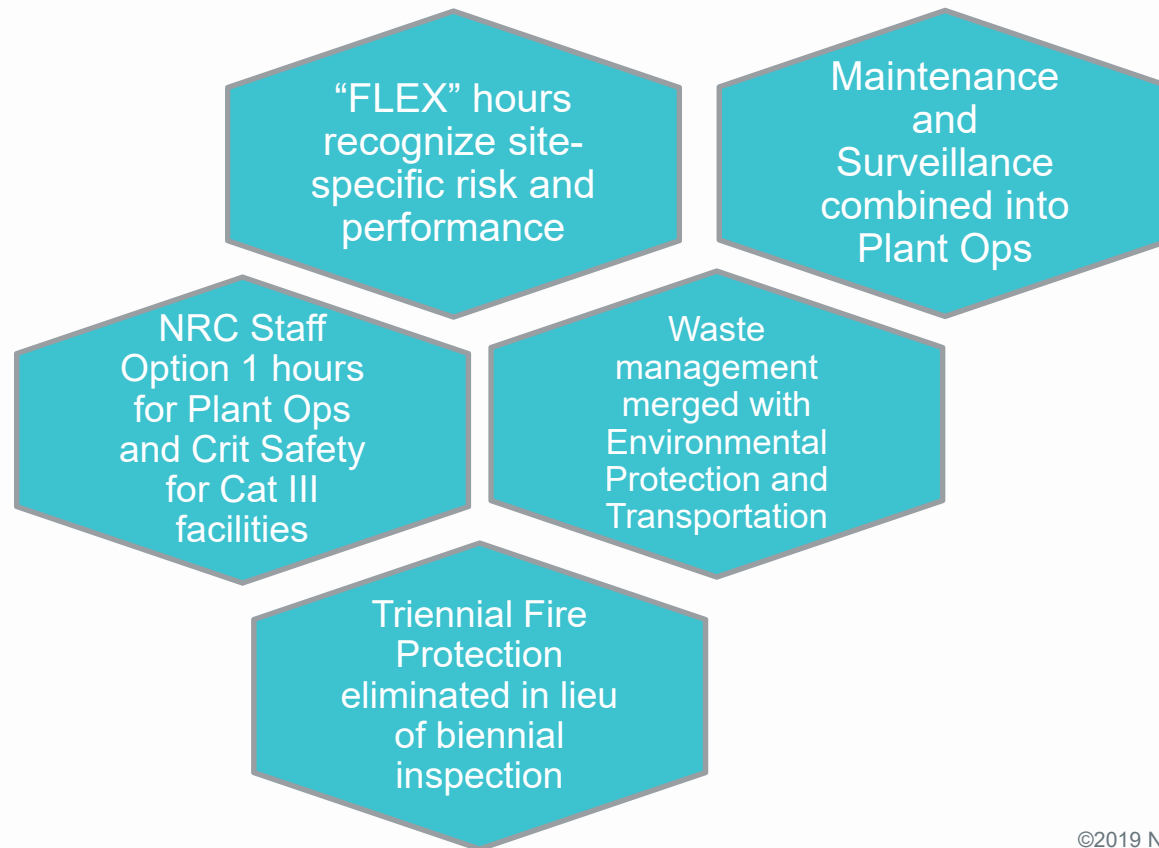




Overview

- Areas of NRC and Industry Alignment
- Industry Proposal 2 -“FLEX” hours for decreased risk profile
- Cat I Resident Inspector considerations
- Licensee Performance Review (LPR) process
- Two risk-reduction examples used to identify and focus risk-informed adjustments to inspection program
- Additional Smarter Programs issues needing resolution

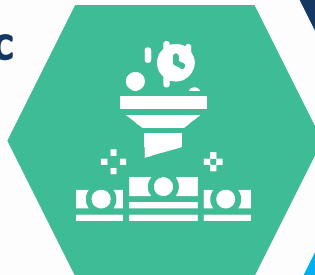
Areas of NRC & Industry Alignment



*Industry Proposal 2 =
Hybrid of NRC Staff Options 1&2 and Industry's Proposal 1*

****Recognition of a Decreased Risk Profile****

**Mature Site-Specific
Integrated Safety
Analysis (ISA)**



Effective CAP



**Demonstrated Safe
Operations – e.g., low
number of significant
violations and events**

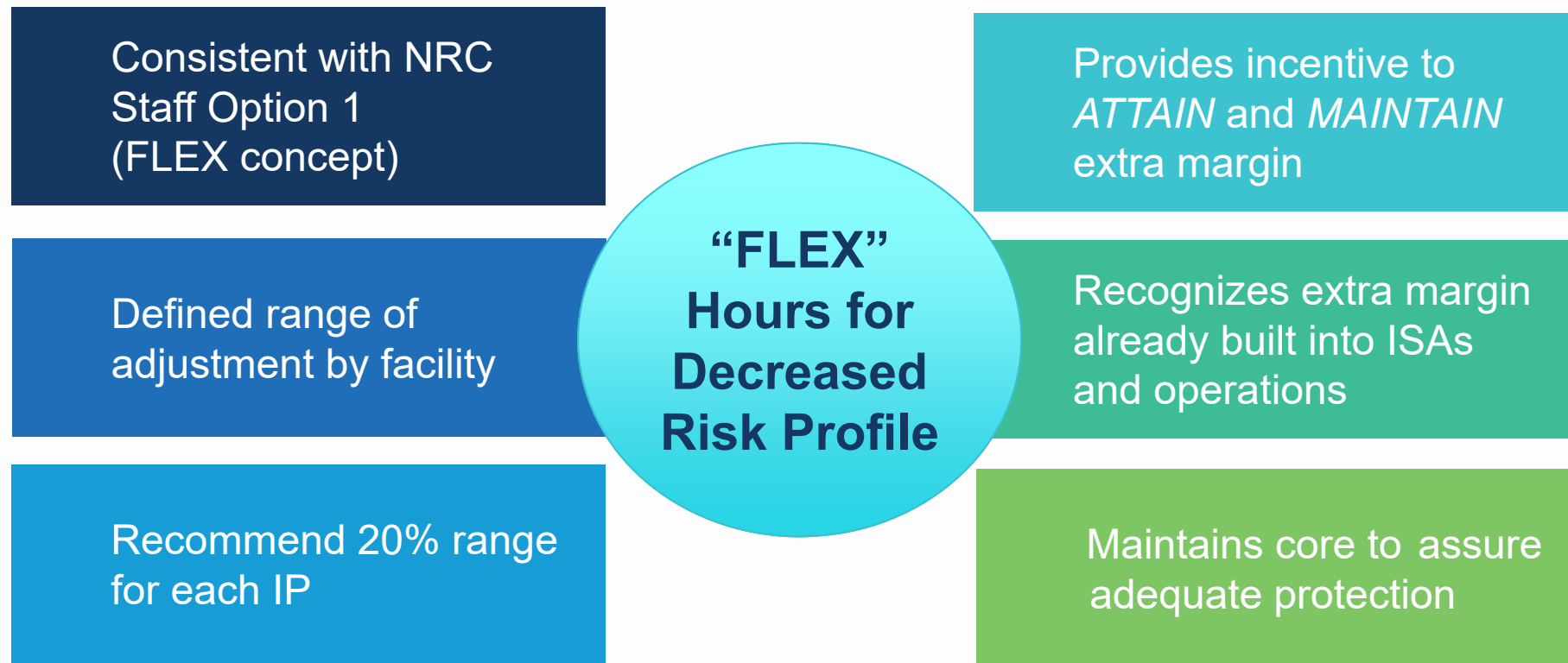
Current Decreased Risk Profile of Fleet

Mature and NRC-accepted ISAs:

- ✓ Improved safety basis for each facility
- ✓ Demonstrated by lower number of safety significant events and violations
- ✓ Strong defense in depth
- ✓ Licensees choose to provide additional margin beyond requirements

Plus:

- ✓ Effective and comprehensive CAPs
- ✓ Sharing of best practices
- ✓ Benchmarking among facilities
- ✓ Timely and effective sharing of operating experience, events, licensing, and inspection experience





BASIS OF INDUSTRY PROPOSAL 2

Context for Industry Proposal 2

- Industry Concerns with Lack of Predictability and Risk Basis for Staff Option 1, e.g., large pool of “FLEX” hours, lack of detail on “Comprehensive” 5-year review
- Hybrid Proposal Utilizes Best Features of Earlier Options and Proposal 1, e.g., Concept of FLEX Hours, Reduced Inspection Hours for Support Areas; While Efficiently Utilizing NRC and Industry Resources
- Industry Proposal 2 is Earnest Attempt at Convergence and Focus on Safety Significant Programs



Category I Fuel Fabrication Facilities – Inspector Scope



- **Resident Inspector Performs Daily Observations**, e.g., Plant Ops, Criticality, MC&A, Mods, Radiation Protection
 - *IMC 2600 says 797 Hours vs 1510 Direct Billable Hours*
- **Resident Inspector Assesses** Licensees Actions to Resolve Issues and Items of More than Minor Safety Significance
- **Reduce** Safety Operations from Proposed 180 Hours to 90 Hours
- **Reduce** MC&A annual to 90 Hours due to Low Risk and Historical Stable and Mature Programs
- **Maintain** Plant Ops and Fire Protection with the **Resident** as is currently implemented today

Licensee Performance Review Process



Used to Inform Inspection Program Adjustments:

1

Use of Living ISAs to Periodically Assess Risk Profiles and Safety Margins

2

Insights on effectiveness of CAP

3

Creates Basis on a Continuing Review to Adjust Program Within FLEX Range of Inspection Hours

4

Additional Means of Oversight Continue as Tool to Further Provide Reasonable Assurance of Adequate Protection

Overview of Two Industry Risk-Reduction Examples



- Examples help demonstrate potential use of site-specific ISAs:
 - 1) How licensees utilize ISAs to prevent and mitigate risk at the facilities, and
 - 2) When evaluating and applying IP adjustments to reflect risk profile
- Numerical values of “Likelihood” are approximate orders of magnitude based on NRC-approved methodology
- Each IROFS is assigned a failure probability range in accordance with NRC-approved methodology
- Overall “Likelihood” is compared to applicable limit for corresponding consequence category, e.g., High, Intermediate, or Low
- Limit for high consequence event is typically 10^{-4}

Industry Risk-Reduction Example 1

Moderator Release onto Process Equipment (Press)

- Sequence has 4 IROFS – 2 Active Engineered Controls; 1 Administrative Control; 1 Passive Engineered Control
- These IROFS provide a total of 10^{-8} failure probability
- This is 4 orders of magnitude greater than the regulatory required performance criteria of 10^{-4} for high consequence event

Additional barriers provided, thus reducing the risk well beyond requirements

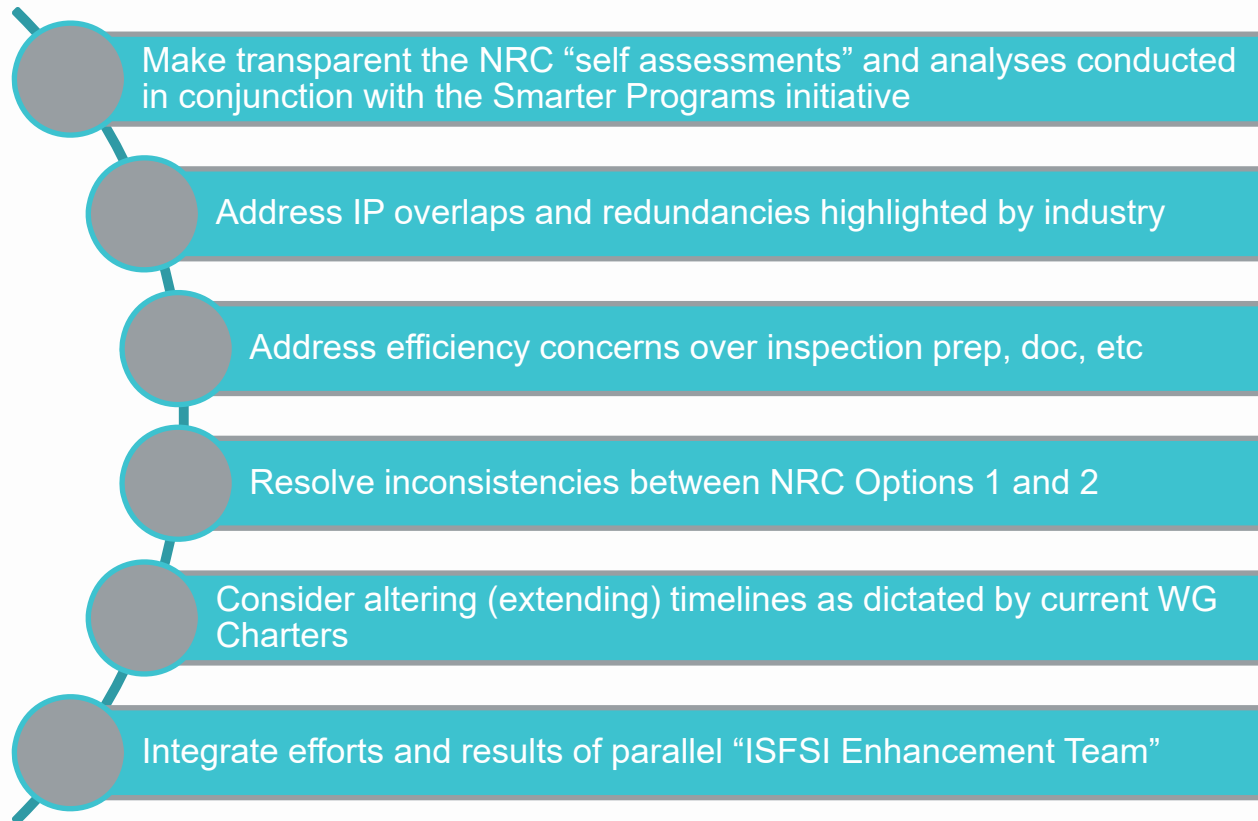
Industry Risk-Reduction Example 2

Moderator Spill Into Vacuum Cleaner

- Sequence has 3 IROFS – 1 Passive Engineered Control; 2 Administrative Controls
- These IROFS provide a total of 10^{-7} failure probability
- This is 3 orders of magnitude greater than the regulatory required performance criteria of 10^{-4} for high consequence event

This example of risk reduction could tolerate an administrative IROFS failure and still meet required performance criteria

Additional Smarter Program Issues Needing Resolution





Industry Proposal 2

(Submitted to NRC 10/15/2019)

Industry Proposal #2
(Industry edits in green)
October 2019

NEI

App B Markup

OPTION 2

		Category I Fuel Facility		Category III Fuel Facility		Uranium Conversion Facility		Gas Centrifuge Facility	
Function / Program Areas	Procedure or Procedure Suite	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)
SAFETY OPERATIONS									
Plant Operations	88020 (OPR)	Biennial	0 30 0 ¹	Annual	60 90 48-60	Annual	60 90 48-60	Annual	60 90 48-60
	88135 (Resident Inspection Program)	Annual	797	-	-	-	-	-	-
Criticality Safety	88015	Annual	196 180 72-90	Annual	64 90 48-60	-	-	Annual	64 90 48-60
Fire Protection	8805X (FPB)	Annual Biennial	0 30 0 ¹	Annual Biennial	32 60 48-60	Annual Biennial	32 60 48-60	Annual Biennial	32 60 48-60
Fire Protection (Triennial)	88072	Triennial	90	Triennial	90	Triennial	90	Triennial	90

1. Keep these IP's with the Resident Inspection Program, as is currently implemented today.

App B Markup Option 2

		Category I Fuel Facility		Category III Fuel Facility		Uranium Conversion Facility		Gas Centrifuge Facility	
Function / Program Areas	Procedure or Procedure Suite	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)
SAFEGUARDS									
MC&A	Procedures as in IMC 2683	Annual	196 129 72-90	Annual Biennial	64 60 48-60	-	-	Annual Biennial	64 60 48-60
MC&A (observation)	Procedures as in IMC 2683	Triennial	30 24-30	Triennial	30 24-30	-	-	Triennial	30 24-30

App B Markup Option 2

		Category I Fuel Facility		Category III Fuel Facility		Uranium Conversion Facility		Gas Centrifuge Facility	
Function / Program Areas	Procedure or Procedure Suite	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)
RADIOLOGICAL CONTROLS									
Radiation Protection	88030 (RP)	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30
Environmental Protection	88045 (Effluent Control and Env.)	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30
Waste Management	88035 (WM)	Biennial	32	Biennial	32	Biennial	32	Biennial	32
Transportation	86740 (T)	Biennial Triennial	32 30 24-30	Biennial Triennial	32 30 24-30	Biennial Triennial	32 30 24-30	Biennial Triennial	32 30 24-30

App B Markup Option 2

		Category I Fuel Facility		Category III Fuel Facility		Uranium Conversion Facility		Gas Centrifuge Facility	
Function / Program Areas	Procedure or Procedure Suite	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)	Inspection Frequency	Estimated Resources per IP (hrs)
FACILITY SUPPORT									
Maintenance / Surveillance	88025 (MS)	-	-	Annual	30	Annual	30	Annual	30
Emergency Preparedness	88050 (EP)	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30	Annual Biennial	32 30 24-30
	88051 (Exercise Observation)	Biennial	48 38-48	Biennial	48 38-48	Biennial	48 38-48	Biennial	48 38-48
Plant Modification (Annual)	88070	Annual	32 30 24-30	Annual	32 30 24-30	Annual	32 30 24-30	Annual	32 30 24-30
Plant ² Modification (Triennial)	88072	Triennial	96 90 72-90	Triennial	96 90 72-90	Triennial	96 90 72-90	Triennial	96 90 72-90

2. After the first round of 88072 inspections, NRC will determine whether or not to continue the "deep dive" triennial inspection. Industry recommends removal after the first round is completed.