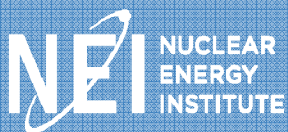


# ***Industry Proposal 2 Smarter Program for Fuel Cycle Facilities***

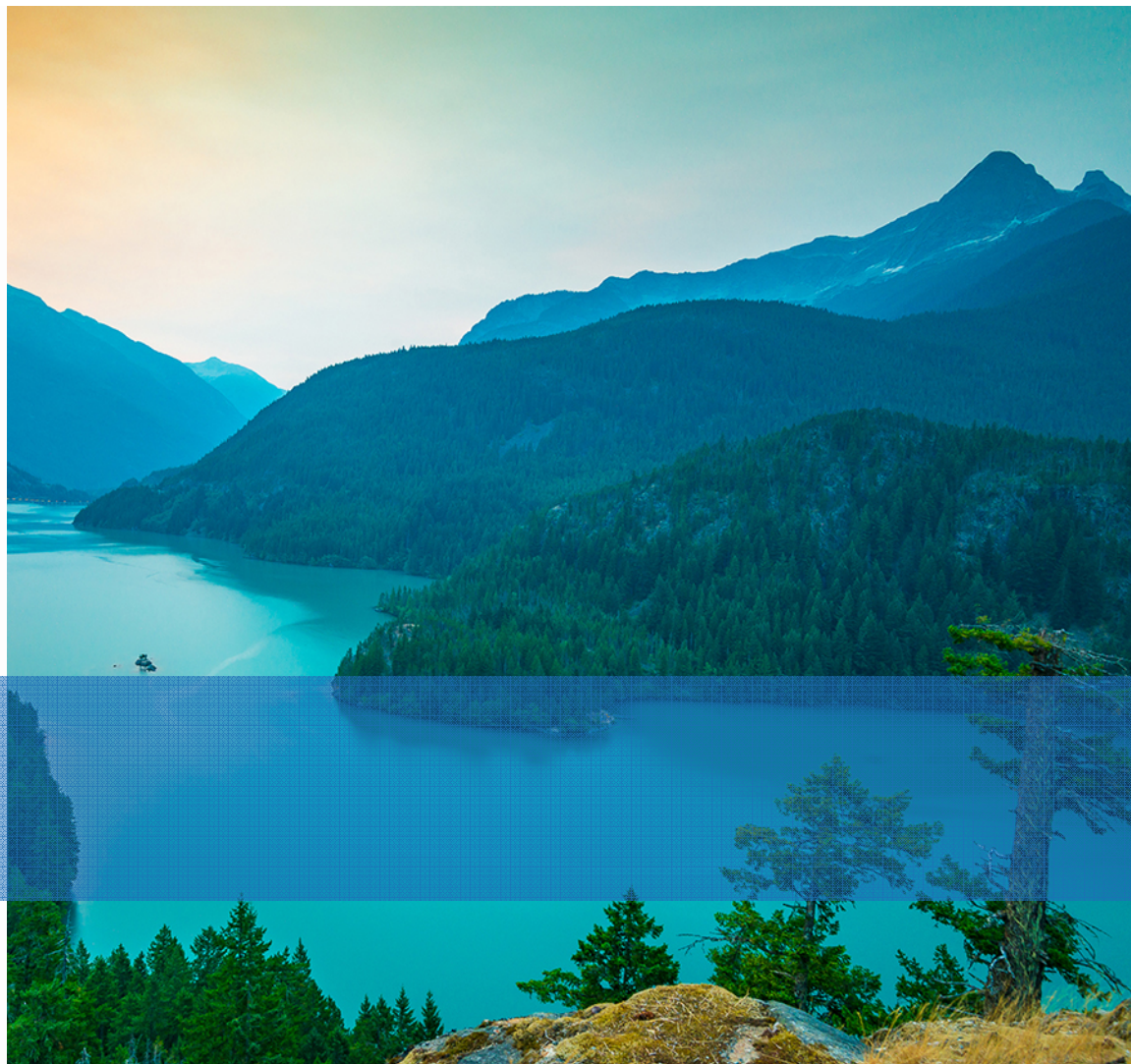
*Bob Link, NEI Consultant*

*Janet Schlueter, NEI*

November 15, 2019 at NRC



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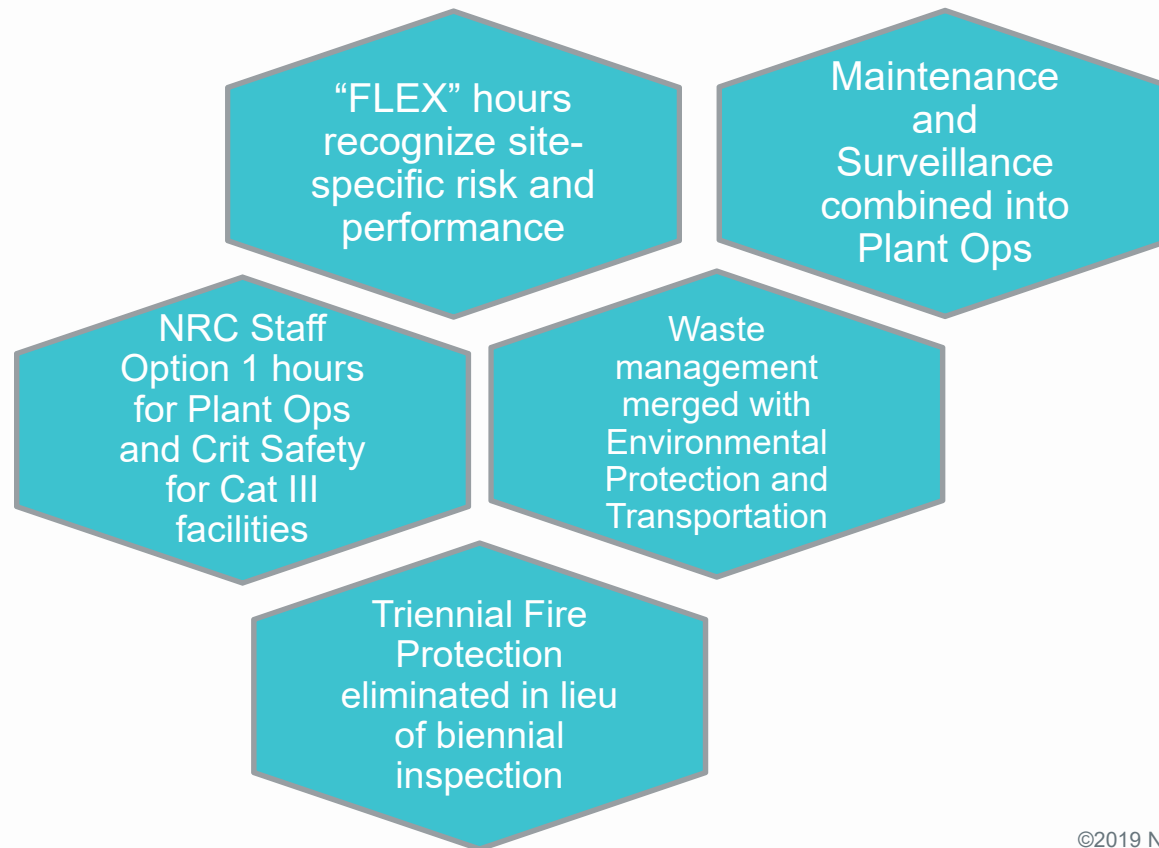




# Overview

- 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

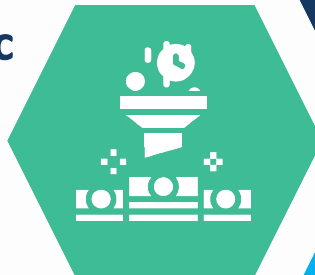
# Areas of NRC & Industry Alignment



*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**

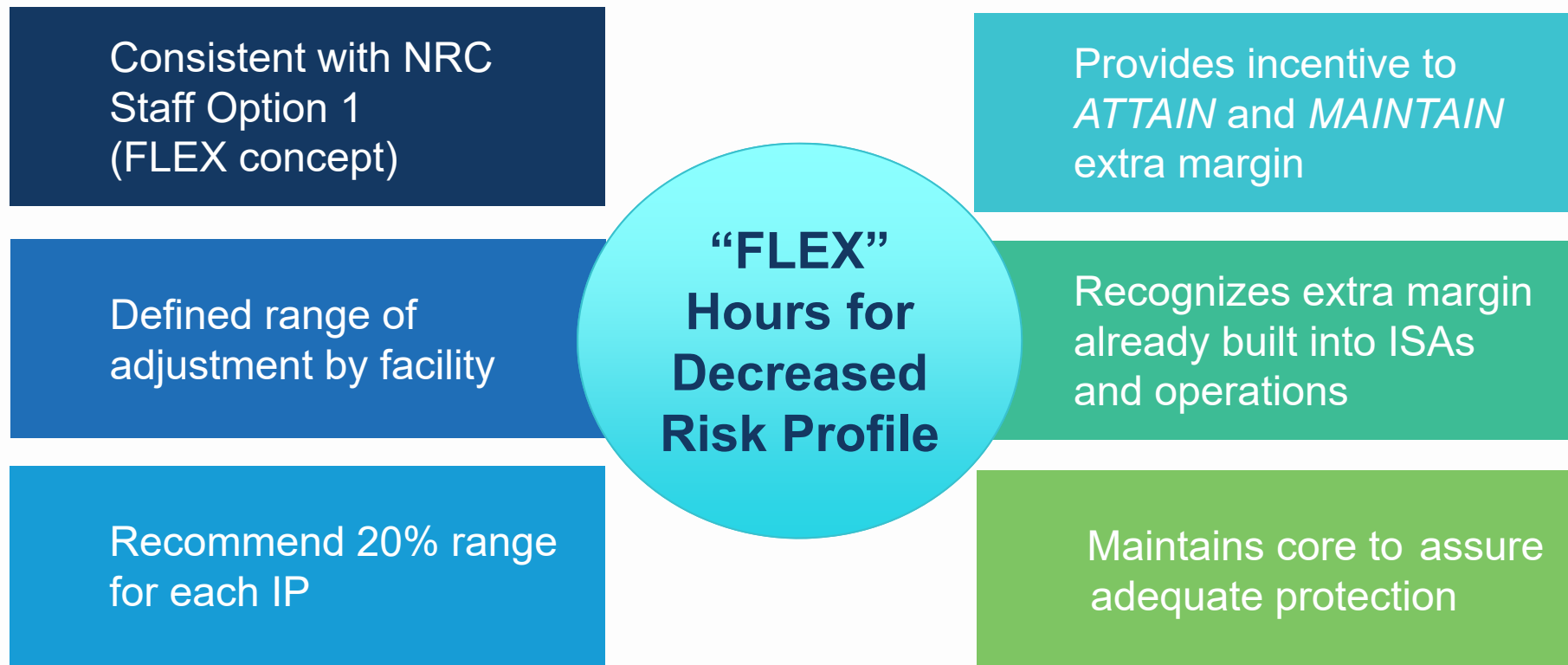
## Current Decreased Risk Profile of Fleet

### *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

- Make transparent the NRC “self assessments” and analyses conducted in conjunction with the Smarter Programs initiative
- Address IP overlaps and redundancies highlighted by industry
- Address efficiency concerns over inspection prep, doc, etc
- Resolve inconsistencies between NRC Options 1 and 2
- Consider altering (extending) timelines as dictated by current WG Charters
- Integrate efforts and results of parallel “ISFSI Enhancement Team”



# Industry Proposal 2

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(Submitted to NRC 10/15/2019)



# 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)
<b>SAFETY OPERATIONS</b>									
Plant Operations	88020 (OPR)	Biennial	<del>0</del> 30 0 <sup>1</sup>	Annual	<del>60</del> 90 48-60	Annual	<del>60</del> 90 48-60	Annual	<del>60</del> 90 48-60
	88135 (Resident Inspection Program)	Annual	797	-	-	-	-	-	-
Criticality Safety	88015	Annual	<del>196</del> 180 72-90	Annual	<del>64</del> 90 48-60	-	-	Annual	<del>64</del> 90 48-60
Fire Protection	8805X (FPB)	<del>Annual</del> Biennial	<del>0</del> 30 0 <sup>1</sup>	<del>Annual</del> Biennial	<del>32</del> 60 48-60	<del>Annual</del> Biennial	<del>32</del> 60 48-60	<del>Annual</del> Biennial	<del>32</del> 60 48-60
<del>Fire Protection (Triennial)</del>	88072	<del>Triennial</del>	90	<del>Triennial</del>	90	<del>Triennial</del>	90	<del>Triennial</del>	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)
<b>SAFEGUARDS</b>									
MC&A	Procedures as in IMC 2683	Annual	<del>196</del> 129 72-90	Annual Biennial	<del>64</del> 60 48-60	-	-	Annual Biennial	<del>64</del> 60 48-60
MC&A (observation)	Procedures as in IMC 2683	Triennial	<del>30</del> 24-30	Triennial	<del>30</del> 24-30	-	-	Triennial	<del>30</del> 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)
<b>RADIOLOGICAL CONTROLS</b>									
Radiation Protection	88030 (RP)	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30
Environmental Protection	88045 (Effluent Control and Env.)	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30
Waste Management	<del>88035 (WM)</del>	Biennial	32	Biennial	32	Biennial	32	Biennial	32
Transportation	86740 (T)	Biennial Triennial	<del>32</del> 30 24-30	Biennial Triennial	<del>32</del> 30 24-30	Biennial Triennial	<del>32</del> 30 24-30	Biennial Triennial	<del>32</del> 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)
<b>FACILITY SUPPORT</b>									
Maintenance/Surveillance	88025 (MS)	=	=	Annual	30	Annual	30	Annual	30
Emergency Preparedness	88050 (EP)	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 30 24-30	Annual Biennial	<del>32</del> 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	<del>32</del> 30 24-30	Annual	<del>32</del> 30 24-30	Annual	<del>32</del> 30 24-30	Annual	<del>32</del> 30 24-30
Plant <sup>2</sup> Modification (Triennial)	88072	Triennial	<del>96</del> 90 72-90	Triennial	<del>96</del> 90 72-90	Triennial	<del>96</del> 90 72-90	Triennial	<del>96</del> 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.