

# Building a Smarter Fuel Cycle Inspection Program

Division of Fuel Cycle Safety,  
Safeguards, and Environmental  
Review

# Purpose

- Background
- Status
- Ideas currently under consideration
- Questions

**Note:** *The information included in this presentation is being shared in draft form for the purpose of gathering insights from our external stakeholders on a range of ideas and recommendations to improve the inspection program. The working group will evaluate all feedback provided and will document any final recommendations to the inspection program.*

# Background: Working Group (WG) Charter

- April 26, 2019 – NRC staff issued the Charter ([ML19074A139](#))
- Conduct holistic assessment of Fuel Cycle inspection program
  - Improve effectiveness and efficiency of program inspections while further integrating risk-informed insights
- Look for areas of transformation and innovation while adhering to the NRC Principles of Good Regulations

# Summary of tasking and status

- Engage stakeholders for feedback
  - Three public meetings
  - Continuous effort
- Assessment inspection program
  - Completed assessment of overlaps, inspection frequency and resource estimates
- Develop and evaluate recommendations
  - Continuous assessment of feedback received
  - Developed range of recommendations for further consideration
- Develop report with conclusions and recommendations

# Summary of Tasking

- Evaluate changes with regards to our mission and [NRC Principles of Good Regulations](#)
  - Independence
  - Clarity
  - Openness
  - Reliability
  - Efficiency

# Fuel Cycle Inspection Program

- Purpose: determine that facilities are operating safely and securely and in accordance with regulations
- Identify indications of declining safety or safeguards performance
- Applies to fuel fabrication facilities, uranium enrichment plants, and uranium conversion plants

# Fuel Cycle Inspection Program

- Inspection Manual Chapter (IMC) 2600 “Fuel Cycle Facility Operational Safety and Safeguards Inspection Program”
  - Core inspection effort
  - Reactive, supplemental, and generic safety issue inspections
  - Implemented through inspection procedures (IPs)
  - Resident inspectors are assigned to Category I fuel cycle facilities

# Fuel Cycle Inspection Program

- Continuous improvements to the program resulting in efficiencies
  - Shifted hours from Region to Resident Inspector at Category 1 facilities
    - Plant Operations
    - Fire Protection
  - Changes to Permanent Plant Modifications inspection
  - Revision to inspection frequency and/or consolidation of specific inspection procedures
- Improvements to address Westinghouse Lessons Learned



# Performance Areas – A risk informed approach

- Assessment of performance areas of IMC 2600 Appendix B to further integrate risk-informed insights
  - Review of historical changes to inspection program
  - Review of compliance history
  - Analysis of operating experience (OpE) and inspection data
  - Insights gathered from inspectors and other subject matter experts
  - Maturity of programs

# Performance Areas – A risk informed approach

- Key Performance Areas - Safety
  - Plant Operations (OPS)
  - Criticality Safety (NCS)
  - Permanent Plant Modifications (PPM)
- Key Performance Areas - Safeguards
  - Material Control & Accounting (MC&A)\*

\*Note: MC&A is part of the safeguards performance area and was specifically listed in the WG charter. Other program areas not specifically listed, include physical protection and classified material and information security.

# Performance Areas – A risk informed approach

- Support Performance Areas
  - Fire Protection (FP)
  - Radiation Protection (RP)
  - Environmental Protection (ENV)
  - Waste Management (WM)
  - Transportation (TRANS)
  - Emergency Preparedness (EP)

# Considerations to optimize the inspection program

- Existing inspection program samples used to verify compliance
- Inspection effort aligned with the safety significance
- Demonstration of sustained performance
  - How is factored into inspection program?
  - What defines sustained performance?
  - Tools to measure it?

# Considerations to optimize the inspection program

- Focus appropriate effort to performance areas
- Cover same ground more efficiently
- Operating experience and enforcement data
- Approaches already implemented or under implementation (e.g. reactor engineering inspection program, spent fuel storage and transportation inspections)

# Considerations to optimize the inspection program

- Corrective Action Program (CAP)
  - Program that identifies and effectively corrects performance issues
  - Program that includes an assessment to evaluate the effectiveness of CAP
  - Program that includes specific attributes and is uniformly implemented across the licensees' organization and licensed operations

# Potential Efficiencies

- Range of potential efficiencies
  - Licensees with a program to identify and effectively correct deficiencies may warrant a higher reduction on the effort and sample used to verify compliance
- What data/reports can be used for each performance area to inform decisions on the program?

CAT 1 EXISTING					
Year	1	2	3	4	5
CONTINUOUS	Resident Inspector Program (includes OPS, FPA)				
ANNUAL	NCS 1, 2, 3 MC&A 1, 2 ENV PPM EP	NCS 1, 2, 3 MC&A 1, 2 ENV PPM EP	NCS 1, 2, 3 MC&A 1, 2 ENV PPM EP	NCS 1, 2, 3 MC&A 1, 2 ENV PPM EP	NCS 1, 2, 3 MC&A 1, 2 ENV PPM EP
BIENNIAL		RP WM TRANS EPX		RP WM TRANS EPX	
Triennial			FPT PPMT		
AS NEEDED	EVENT BASED (Reactive, supplemental) inspections, PI&R				



CAT 1 PROPOSAL (Proposal A)					
Year	1	2	3	4	5
CONTINUOUS	Resident Inspector Program (includes OPS, FPA)				
ANNUAL	OPS 1, 2 NCS 1, 2, 3 MC&A 1	OPS 1, 2 NCS 1, 2, 3 MC&A 1	OPS 1, 2 NCS 1, 2, 3 MC&A 1	OPS 1, 2 NCS 1, 2, 3 MC&A 1	OPS 1, 2 NCS 1, 2, 3 MC&A 1
FOCUSED INS	FOCUSED INS	FOCUSED INS	FOCUSED INS	FOCUSED INS	COMPREHENSIVE INS
AS NEEDED	EVENT BASED (Reactive, supplemental) inspections				
FOCUSED INS	FP, ENV, TRANS, EP, RP, WM, PPM (shift to OPS), CAP (3 or 5 years) or PI&R (annually)				

## CAT 1 Proposal (Proposal B)

Year	1	2	3	4	5
<b>CONTINUOUS</b>	Resident Inspector Program (includes DPS)				
<b>ANNUAL</b>	NCS 1, 2 MC&A 1, 2* ENV RP	NCS 1, 2 MC&A 1, 2* ENV RP	NCS 1, 2 MC&A 1, 2* ENV RP	NCS 1, 2 MC&A 1, 2* ENV RP	NCS 1, 2 MC&A 1, 2* ENV RP
<b>BIENNIAL</b>		DPS PPM EP EPX		DPS PPM EP EPX	
<b>Triennial</b>			FPT TRANS		
<b>AS NEEDED</b>	EVENT BASED (Reactive, supplemental) inspections, CAP (3 or 5 years) or PI&R (annually)				

Cat 3 EXISTING					
Year	1	2	3	4	5
ANNUAL	OPS I, 2	OPS I, 2	OPS I, 2	OPS I, 2	OPS I, 2
	NCS I, 2	NCS I, 2	NCS I, 2	NCS I, 2	NCS I, 2
	FPA	FPA	FPA	FPA	FPA
	MC&A I	MC&A I	MC&A I	MC&A I	MC&A I
	ENV	ENV	ENV	ENV	ENV
	MS	MS	MS	MS	MS
	EP	EP	EP	EP	EP
	PPM	PPM	PPM	PPM	PPM
BIENNIAL		RP		RP	
		WM		WM	
		TRANS		TRANS	
		EPX		EPX	
Triennial			FPT		
			PPMT		
AS NEEDED	EVENT BASED (Reactive, supplemental) inspections, PI&R, CAP				

CAT 3 PROPOSAL (Proposal C)					
Year	1	2	3	4	5
ANNUAL	DPS 1, 2	DPS 1, 2	DPS 1, 2	DPS 1, 2	DPS 1, 2
	NCS 1, 2	NCS 1, 2	NCS 1, 2	NCS 1, 2	NCS 1, 2
	MC&A 1*	MC&A 1*	MC&A 1*	MC&A 1*	MC&A 1*
FOCUSED INS	FOCUSED INS	FOCUSED INS	FOCUSED INS	FOCUSED INS	COMPREHENSIVE INS
AS NEEDED	EVENT BASED (Reactive, supplemental) inspections				

FOCUSED INS	FP, ENV, TRANS, EP, RP, WM, PPM (shift to OPS), CAP (3 or 5 years) or PISR (annually)
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CAT 3 Proposal (Proposal D)					
Year	1	2	3	4	5
ANNUAL	OPS 1, 2 <sup>+</sup> NCS 1, 2 MC&A 1, 2* ENV RP	OPS 1, 2 <sup>+</sup> NCS 1, 2, 3 MC&A 1, 2* ENV RP	OPS 1, 2 <sup>+</sup> NCS 1, 2, 3 MC&A 1, 2* ENV RP	OPS 1, 2 <sup>+</sup> NCS 1, 2, 3 MC&A 1, 2* ENV RP	OPS 1, 2 <sup>+</sup> NCS 1, 2, 3 MC&A 1, 2* ENV RP
BIENNIAL		OPS PPM EP EPX		OPS PPM EP EPX	
Triennial			FPT TRANS		
AS NEEDED	EVENT BASED (Reactive, supplemental) inspections, CAP (3 or 5 years) or PIR (annually)				

# Proposal A and C

- Focus appropriate effort on key performance areas
- Allow flexibility within a pre-determined amount of hours to be allocated to support performance areas
- Cover all the support performance areas in a cycle
- Annual sample and in-depth inspection every 5 years

# Proposal B and D

- Focus appropriate effort on key performance areas
- Changes to frequency and hours on support performance areas
- Covers all the support performance areas

# Questions

