

# Strategic Programmatic Overview of the Operating and New Reactors Business Lines



# Introduction

## Dan Dorman

Deputy Executive Director for Reactor and Preparedness Programs, Office of the Executive Director for Operations





# Operating Reactor Business Line

**Andrea Veil**, Strategic Priorities and Successes for the Operating Reactors Business Line

**Caty Nolan**, Continuously Improving the Reactor Oversight Process

**Frank Arner**, Leveraging Risk-insights to Enhance the Oversight of Operating Reactors

**Caroline Carusone**, Modernizing Our Licensing Programs



# Strategic Priorities and Successes Operating Reactors Business Line

**Andrea Veil**

Director, Office of Nuclear Reactor Regulation



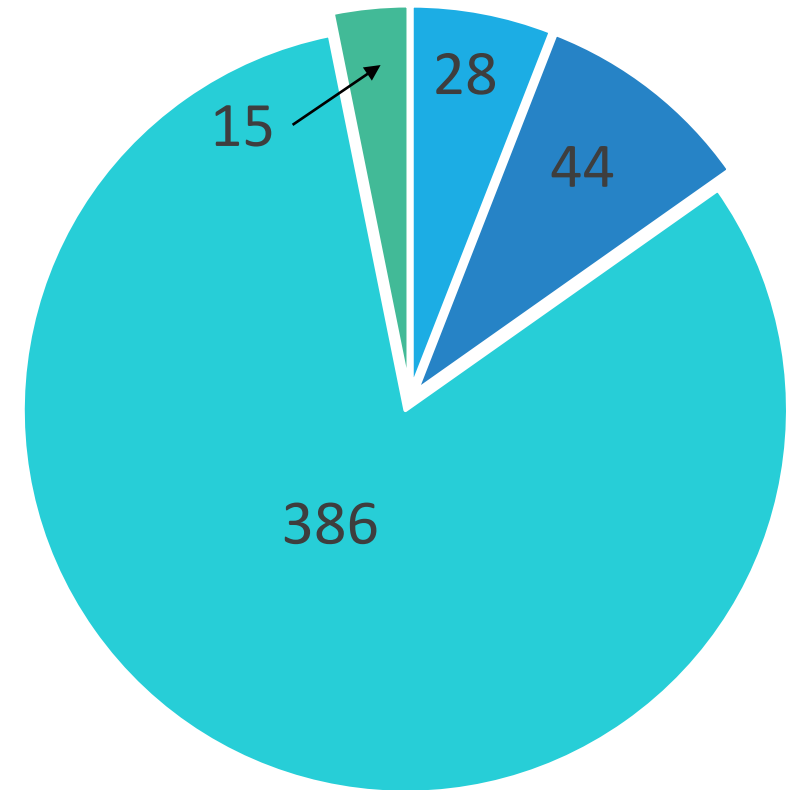
# COVID-19: Maintaining Safety and Security while Preserving Openness and Transparency



Opportunities for  
public and industry  
engagement



COVID-19  
licensing  
actions Issued



LAR

Relief Request

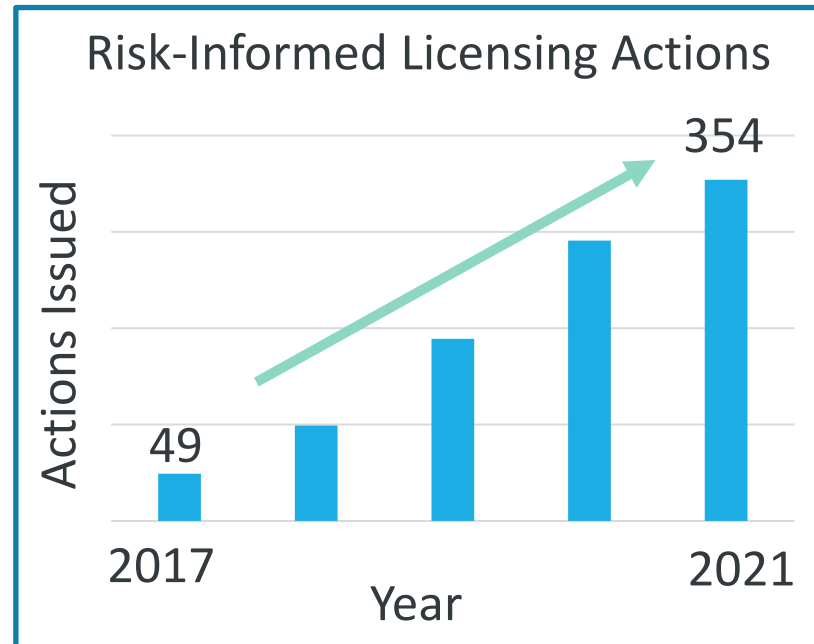
Exemption

Other

# The Reactor Oversight Process Continues to Provide Objective, Risk-Informed, Understandable, and Predictable Oversight



Implementing  
continuous  
improvements



Inspecting risk-  
informed initiatives



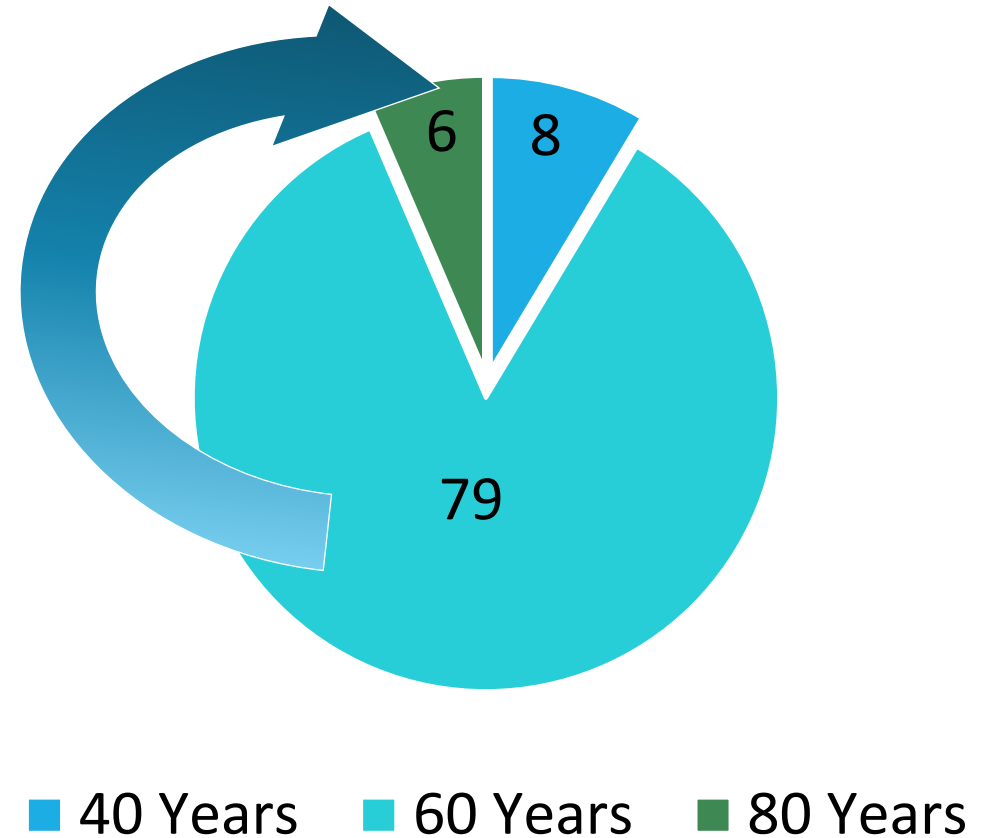
Focusing using the very  
low safety significance  
issue resolution process

# NRC Subsequent License Renewal Reviews Make Safe Long-term Operation Possible

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Key considerations for long-term operation:

- ✓ **SAFETY**
  - ✓ Reliability
- 





# Post-Fukushima Actions Have Improved Operating Nuclear Fleet Safety



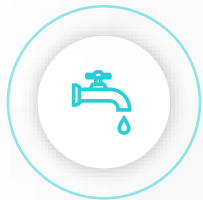
Added capabilities to maintain key plant safety functions following a large-scale natural disaster



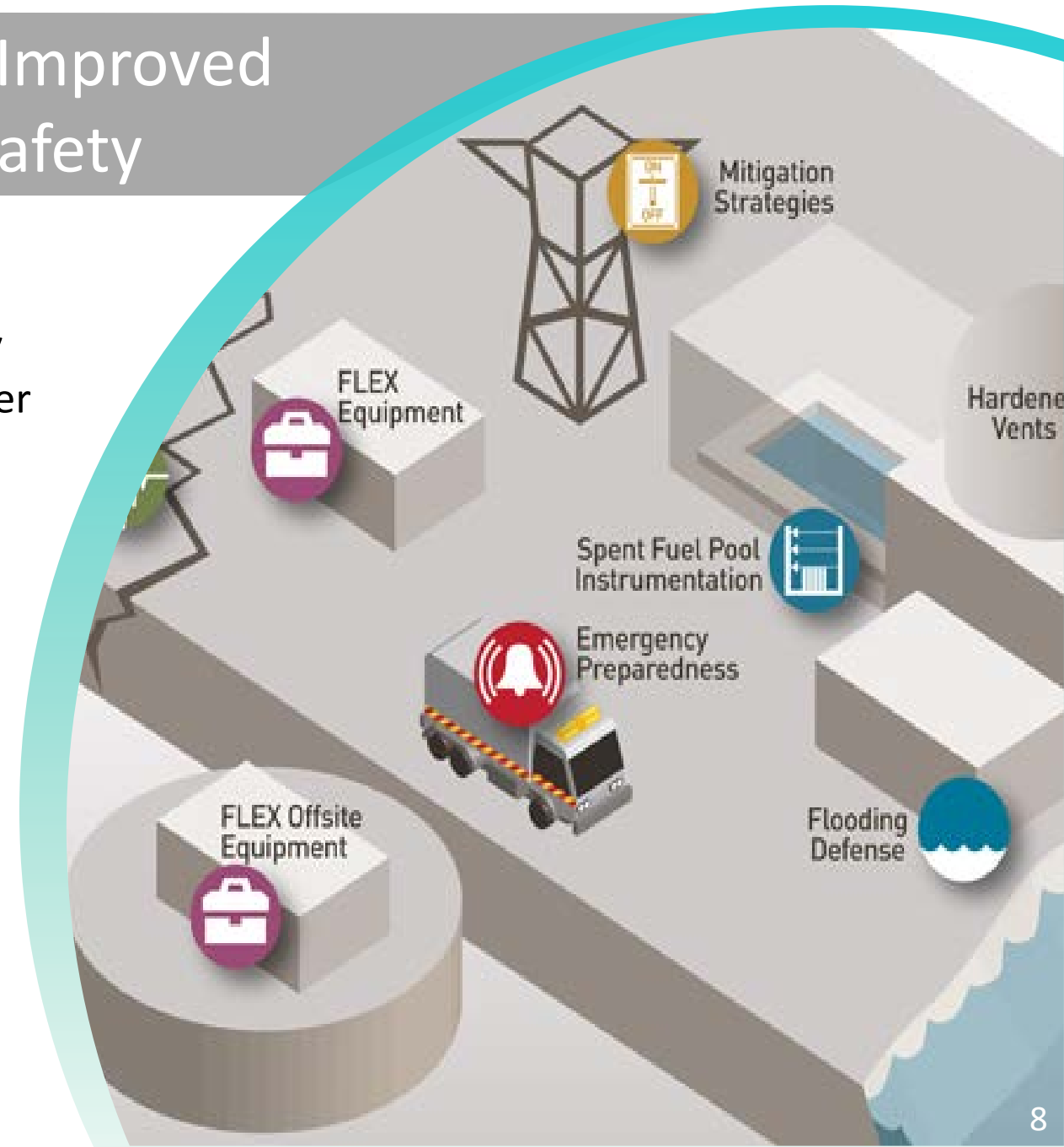
New equipment to better handle potential reactor core damage events



Strengthened emergency preparedness capabilities



Updated evaluations of the potential impact from seismic and flooding events





We Are Modernizing our  
Regulatory Infrastructure to  
Better Enable New  
Technologies

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Digital I&C

Accident Tolerant Fuel

# We Are a Leader in Transformation and Innovation to Become a More Modern Risk-Informed Regulator

**Be riskSMART**

Risk Informed  
Decisions



Data-Driven  
Decisions



Innovation  
Accelerator/Crowdsourcing



# We Are Developing Our 21st Century Workforce

Culture  
Initiatives



Diversity and  
Inclusion



Professional  
Development



Knowledge  
Management



# Continuously Improving the Reactor Oversight Process

**Caty Nolan**

Reactor Systems Engineer, Division of Reactor  
Oversight, NRR





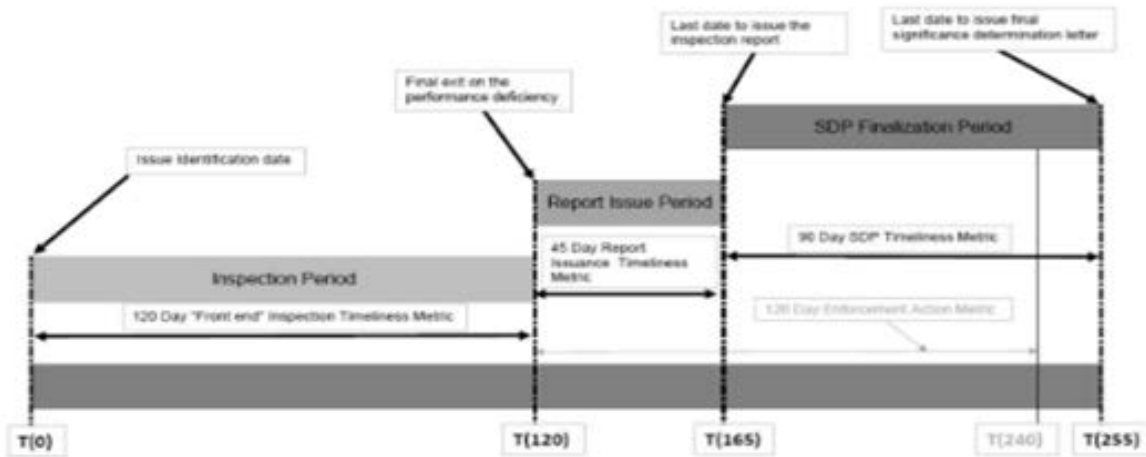
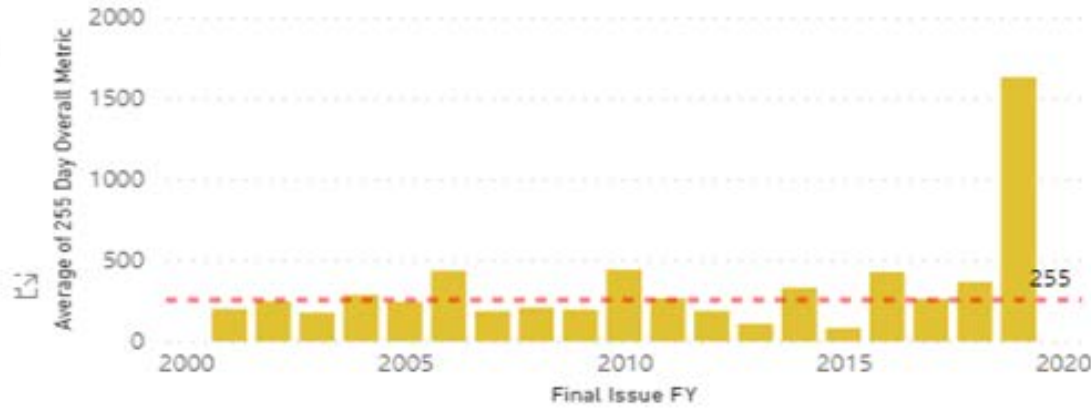
Final SDP Color

- GREEN
- GTG (security)
- Minor PD
- No PD
- RED
- WHITE
- YELLOW

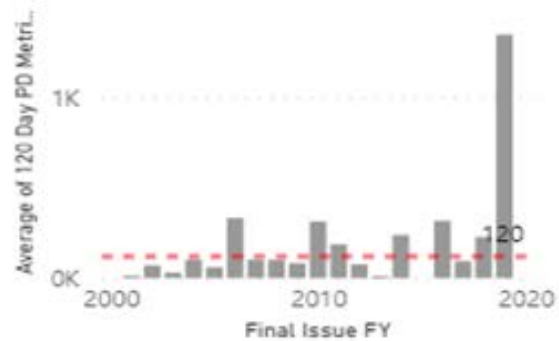
46

Count of EA #

255-Day Overall SDP Completion Metric



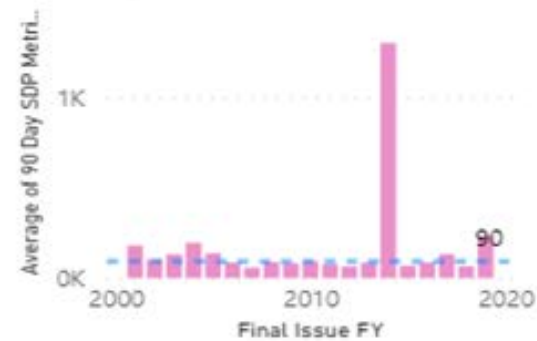
120-Day Inspection Period



45-Day IR Issue Period



90-Day SDP Finalization Period



# SDP Tracker

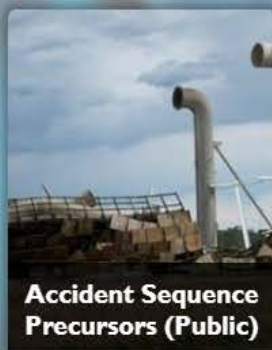
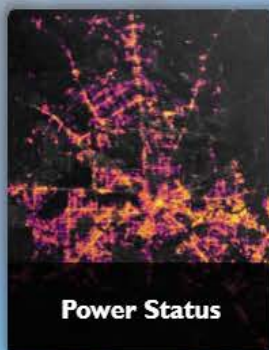


# Modernizing the ROP

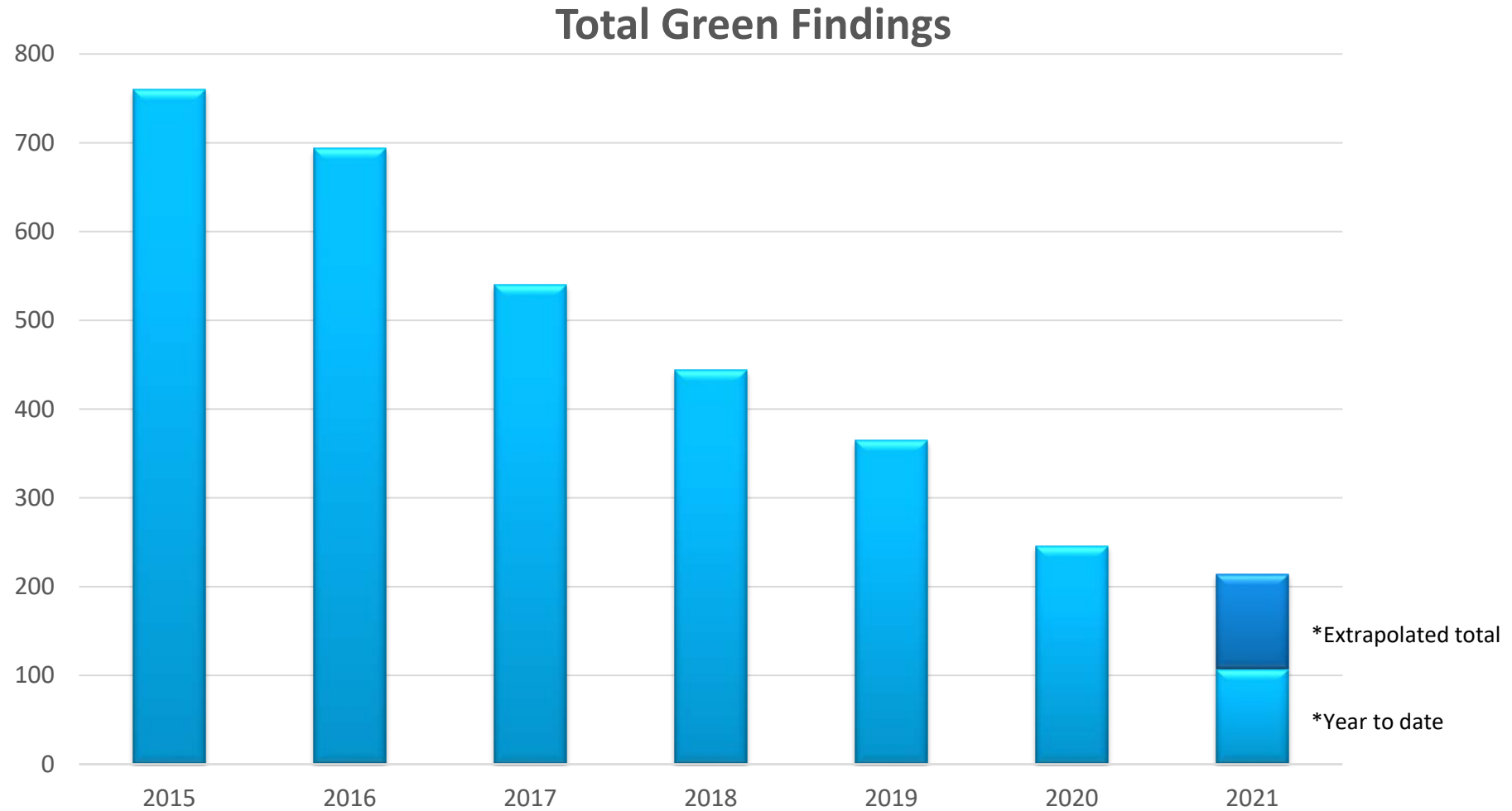
Help

## Operating Experience & Generic Communication Hub

### ROP Monitoring and Information

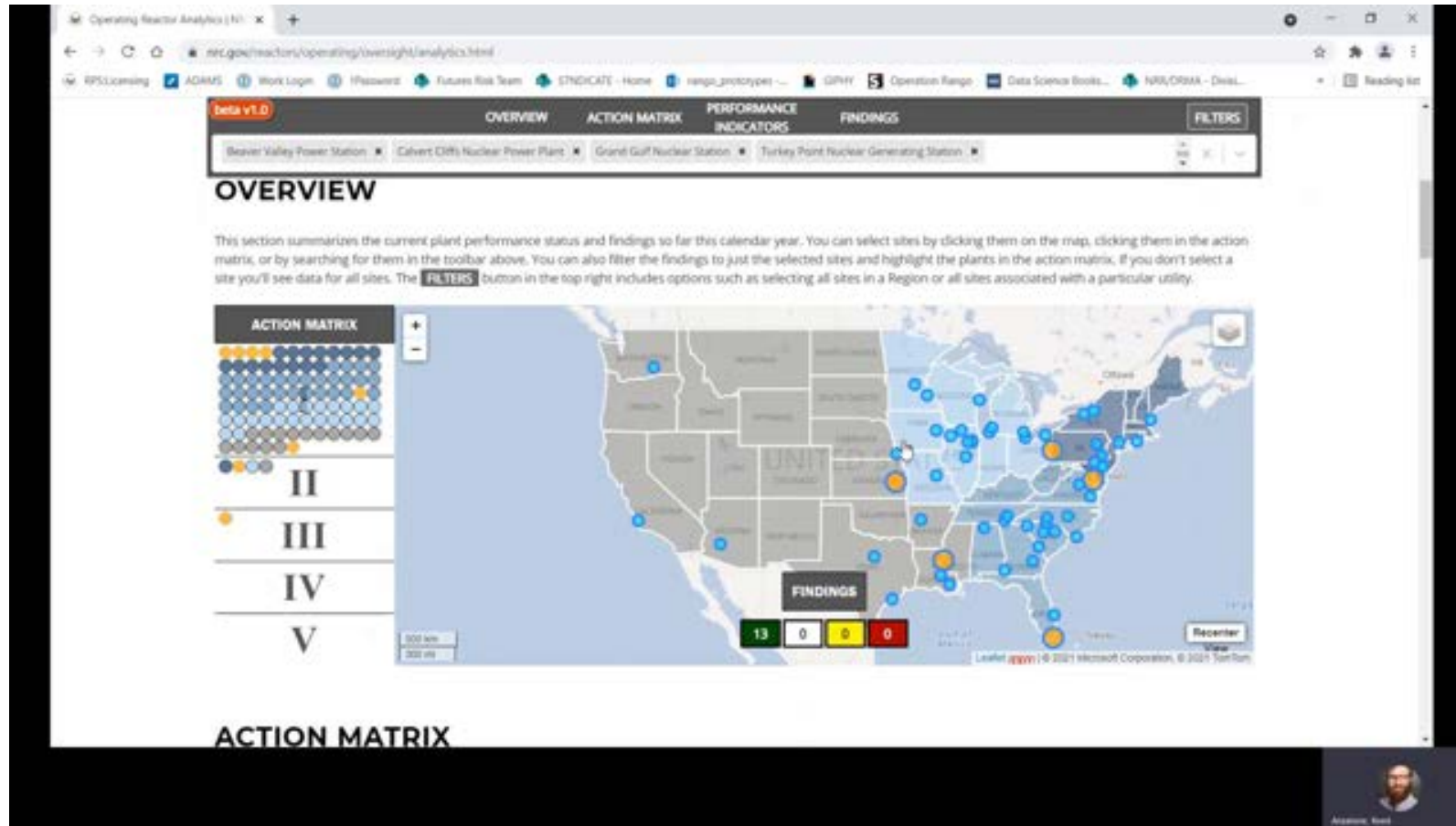


# Turning Data into Insights





# Operating Reactor Analytics



DEMO VIDEO *Developed by Embark Venture Studios*



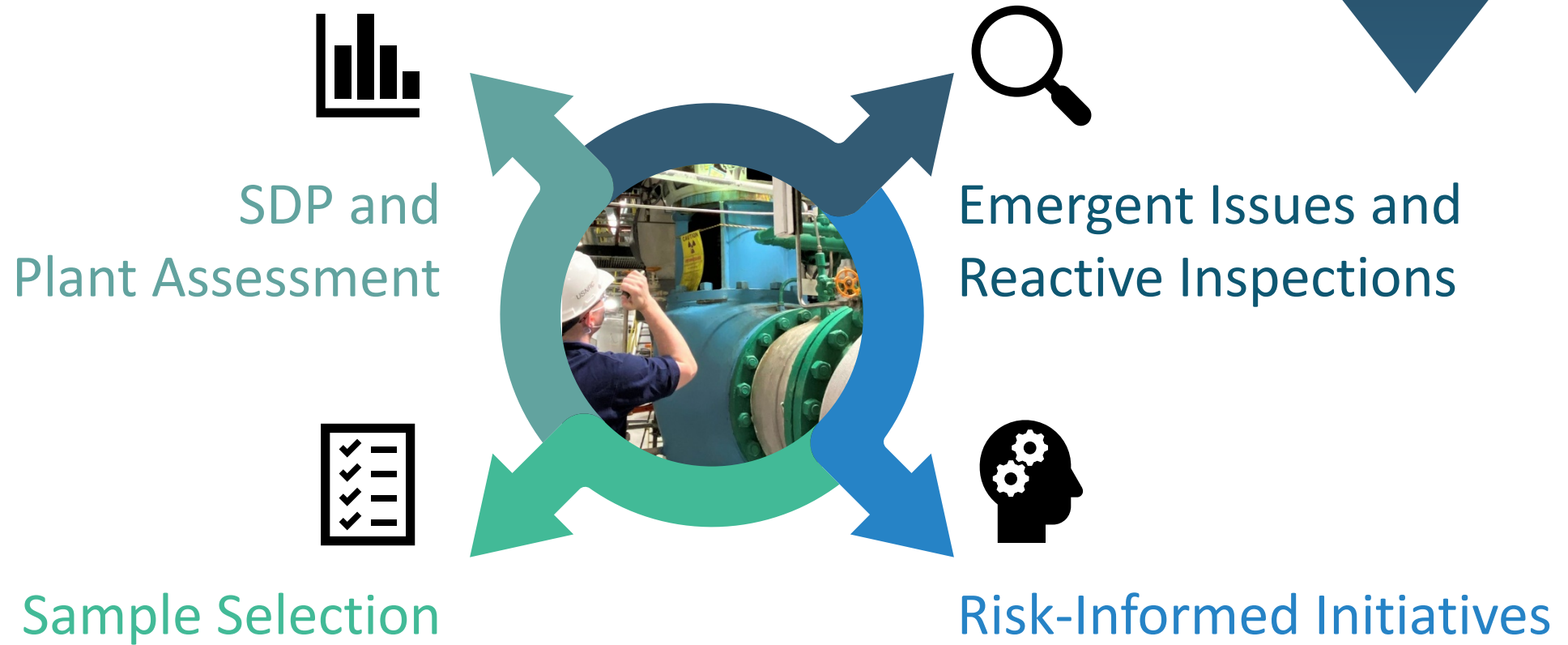
# Leveraging Risk-insights to Enhance Oversight of Operating Reactors

**Frank Arner**

Senior Reactor Analyst, Division of Operating Reactor Safety, Region 1



# PRA Models Are Integral to the Reactor Oversight Process



# Use of PRA Insights in the Oversight of Risk-Informed Initiatives

## Examples

- Use of 10 CFR 50.69 allowed for expedited repair of degraded piping.
- Use of the TSTF-505 program allowed for the safe online repair of components that would normally exceed Technical Specification allowed outage time.

Sites with approved Risk-informed Programs



50.69



TSTF-505



# Use of Risk Tools to Be riskSMART Regulators

NRC Standardized Plant Analysis Risk  
SPAR models



Provide **independence** from  
Licensee models



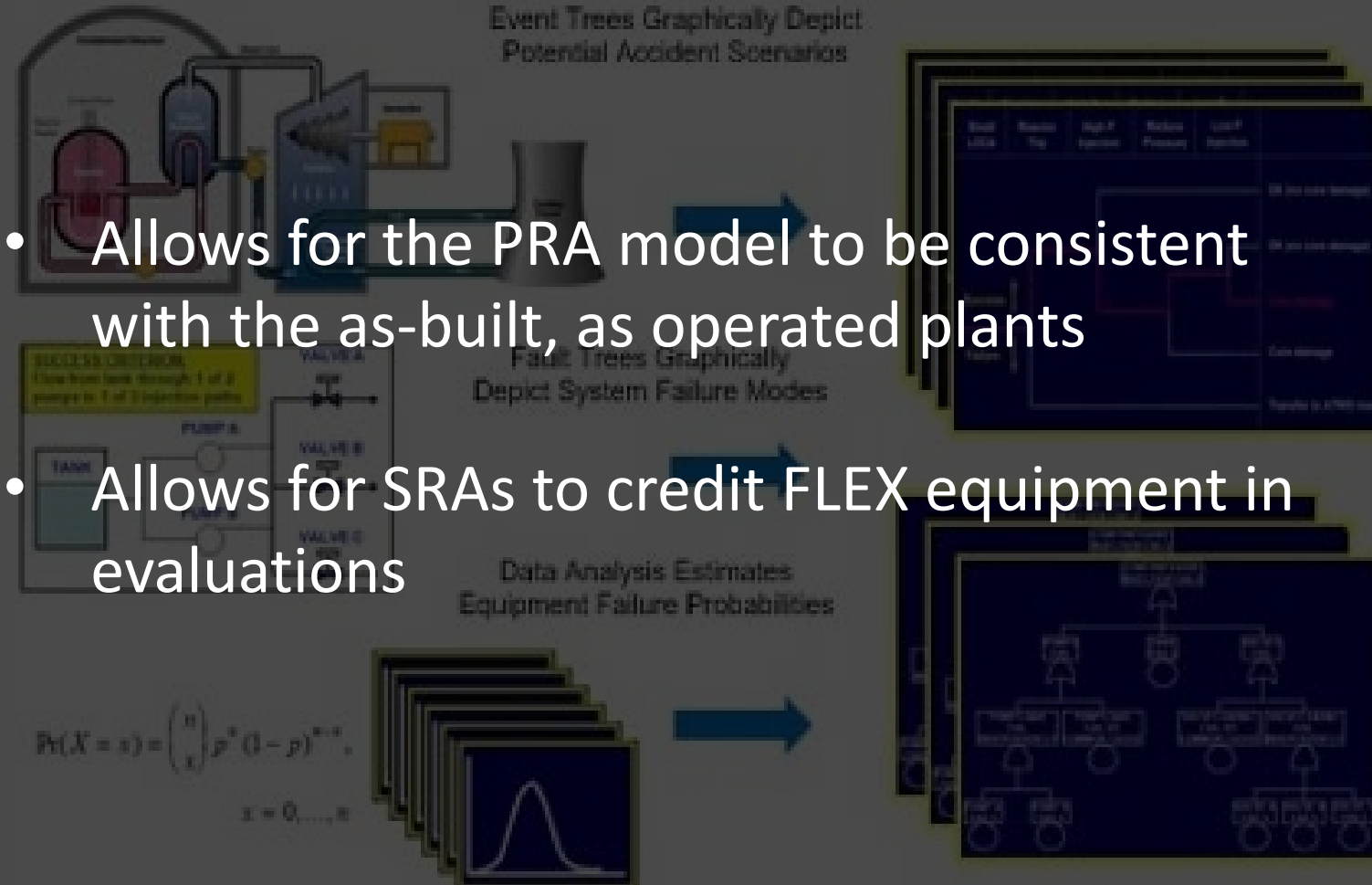
Allow for **independent** analysis and  
appropriate Action Matrix input  
conclusions



# Our Models Are Updated to Ensure Robust ROP Execution



- Allows for the PRA model to be consistent with the as-built, as operated plants
- Allows for SRAs to credit FLEX equipment in evaluations



# Preparing the Next Generation of Risk Professionals

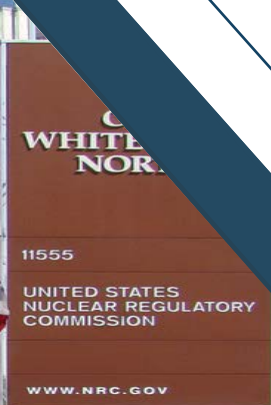
- Weekly knowledge transfer sessions
- Resident inspector and Senior Reactor Analyst interactions during site turnovers
- Required SRAs and risk analyst qualification courses to ensure risk professionals stay in tune with state-of-the-art practices



# Modernizing Our Licensing Program

**Caroline Carusone**

Deputy Director, Division of Operating  
Reactor Licensing, NRR





# Modernizing Our Licensing Program



Enhancing  
Stakeholder  
Engagement



Expanding Use  
of Data and  
Business Tools



Strengthening  
Organizational  
Capacity



# Incorporating Stakeholder Feedback into Licensing Program



**Risk-Informed  
Process for  
Evaluations**



**COVID-19  
Regulatory  
Response**



**10 CFR 2.206  
Program  
Improvements**

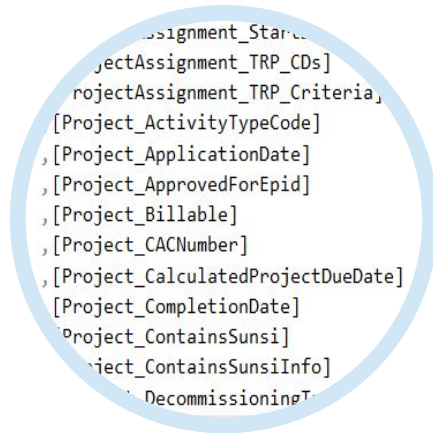


**Revamped  
Technical Assistance  
Request (TAR) Process**

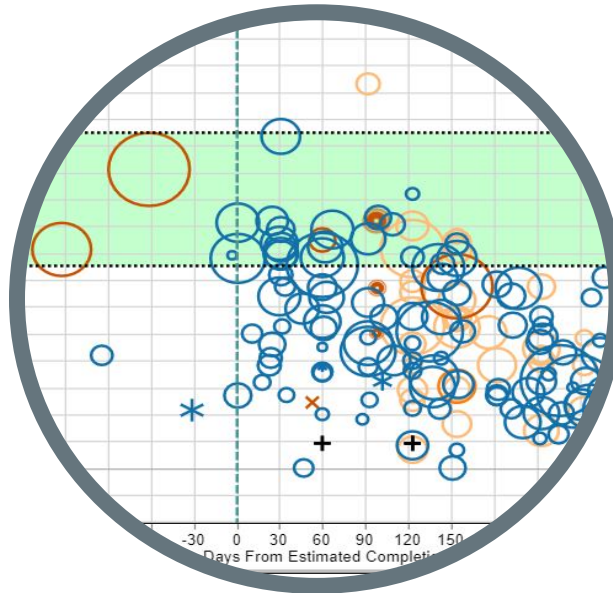
Average time to complete  
Old: 365+ days  
New: 30 days

31 public meetings  
233 actions completed in FY21  
31 Days Average review time  
30 Online Submissions  
Over \$500k Cost Savings with  
Summary FRNs

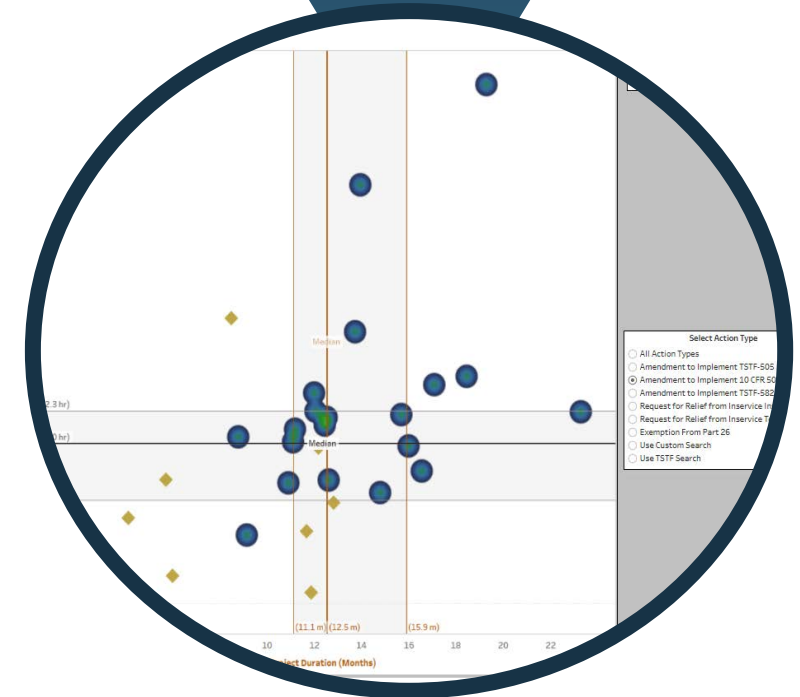
# Expanding Use of Data and Business Tools



Data **intake**  
architecture and  
access

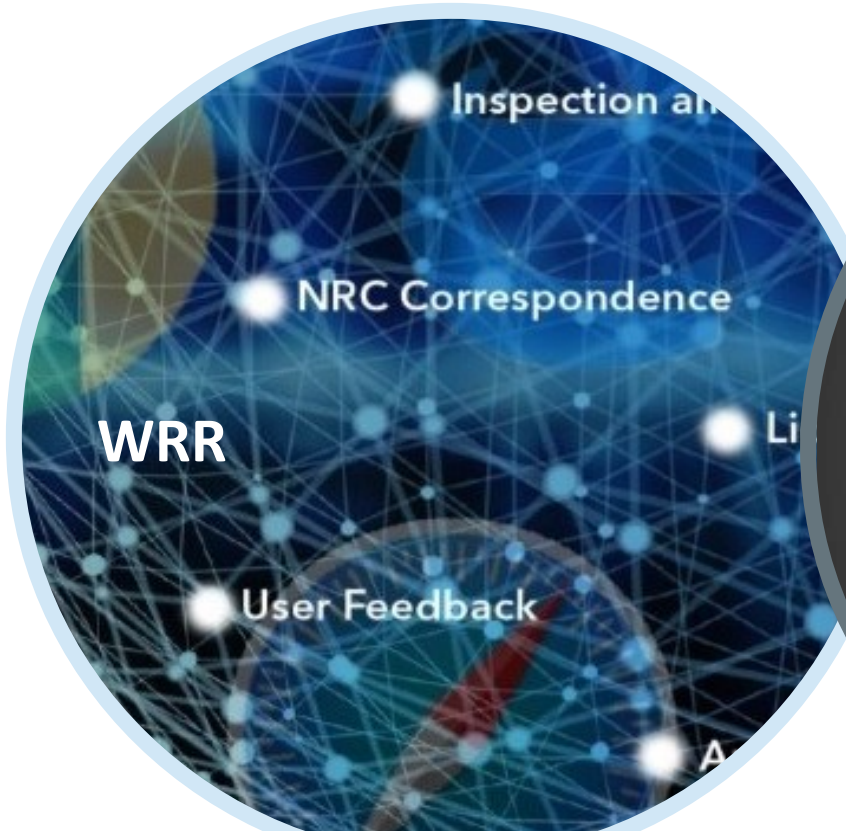


Data visualization to  
track **performance** and  
understand resource  
impacts

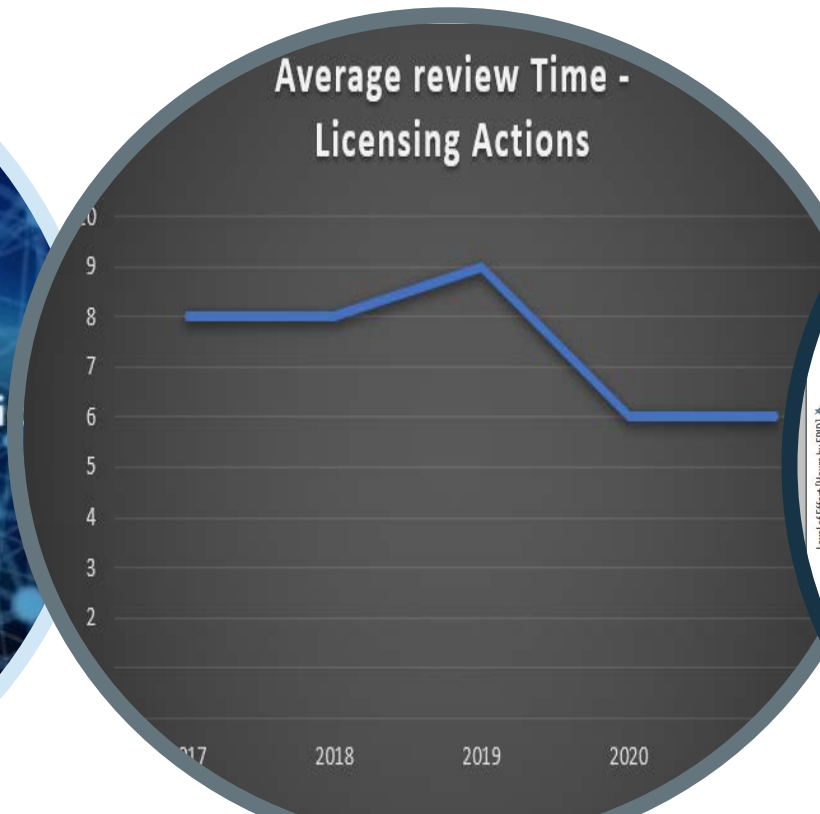


Trends analysis to **predict**  
and plan for the future

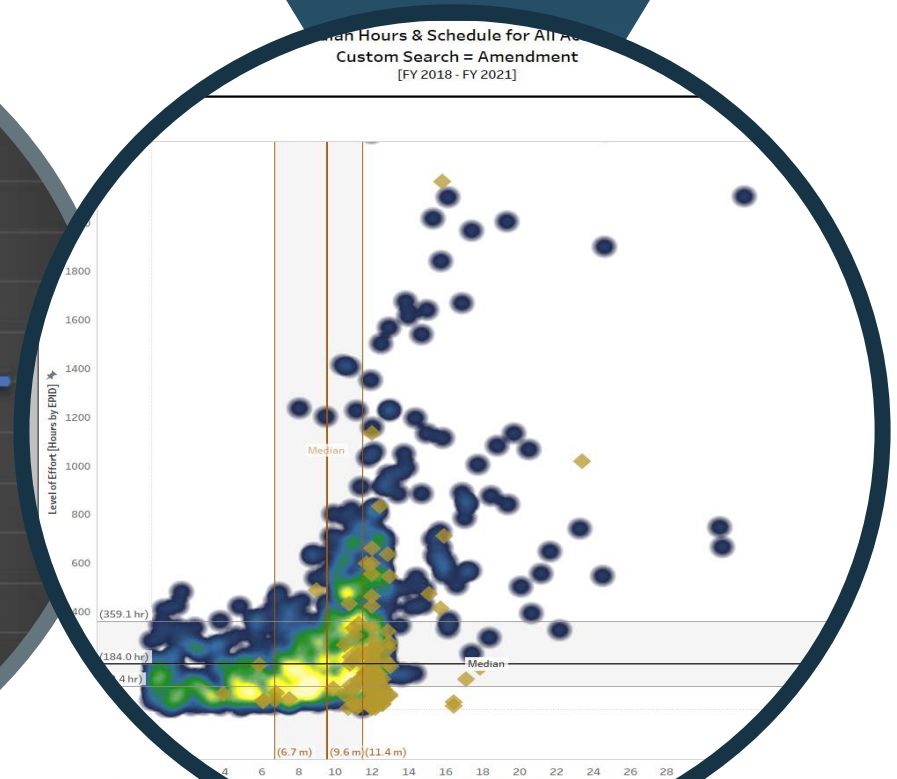
# Early Returns on Data Modernization Efforts



**Intake:** Web-Based Relief Request Portal



**Performance:** Integrated Workload Management Tools



**Prediction:** Licensing Action Precedent Analysis

# Strengthening Organizational Capacity



Evolving  
Risk-Informed  
Mindset and  
Customer Focus



Leveraging  
Collective  
Talents



Cross-Training  
and Knowledge  
Management



# Closing Remarks

**Dan Dorman**

Deputy Executive Director for Reactor and  
Preparedness Programs, Office of the Executive  
Director for Operations



# Acronyms

CFR	Code of Federal Regulations
FLEX	Diverse and Flexible Coping Strategies
INPO	Institute of Nuclear Power Operations
LAR	License Amendment Request
MAP	Mission Analytics Portal
MAP-X	Mission Analytics Portal – External
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PRA	Probabilistic Risk Assessment
ROP	Reactor Oversight Process
SDP	Significance Determination Process
SPAR	Standardized Plant Analysis Risk
TSTF	Technical Specification Task Force

# Introduction

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Deputy Executive Director for Reactor and Preparedness Programs, Office of the Executive Director for Operations





# New Reactor Business Line

**Andrea Veil**, Strategic Priorities and Successes for the New Operating Reactors Business Line

**Nicole Coover**, Vogtle Units 3 and 4

**Mohamed Shams**, Advanced Reactor Preparedness

**Steven Vitto**, Security Considerations for Advanced Reactors





# Strategic Priorities and Successes

## New Reactors Business Line

**Andrea Veil**

Director, Office of Nuclear Reactor Regulation







# Vogtle 3 and 4

## Advanced Reactors

## Key Successes



Collaborating with the Canadian Nuclear Safety Commission

Supporting national priorities:  
Advanced Reactor Demonstration Program

Preparing for new light-water reactor applications

Ensuring workforce readiness



# Transition of Vogtle Unit 3 to Operations and Preparing for the 10 CFR 52.103(g) Finding for Unit 4

**Nicole Coover**

Branch Chief, Division of Construction  
Oversight, Region 2



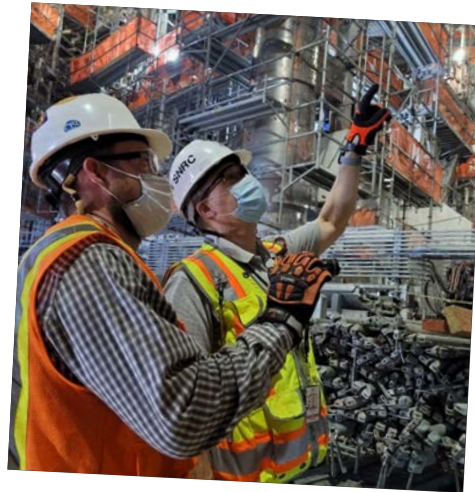




NRC and SNC Executive  
Site Visits



Vogtle Readiness Group



Teamwork by regional,  
resident, & HQ inspectors



The NRC... IS WELL-POSITIONED AND EQUIPPED to conduct inspections and address emergent licensing issues.





Testing team reviewing hot functional testing data

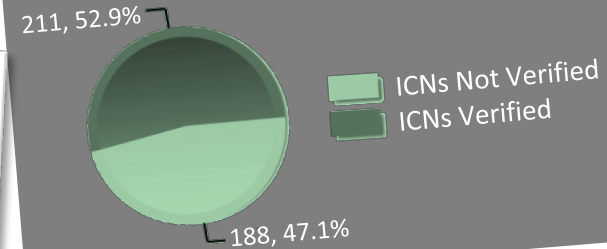
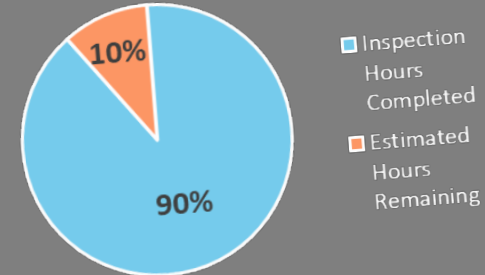


First fuel receipt

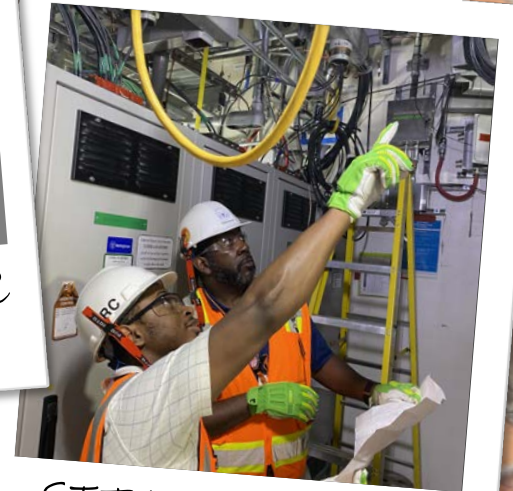


Reactor Vessel Internals

Required Completion Prior to 52.103(g) Finding



Unit 3 Inspection and ITAAC Closure Notice Statuses



SIT inspecting the electrical raceway

...HAS THE EXPERTISE AND CAPACITY to effectively oversee the Vogtle 3&4 construction project.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

August 14, 2020

MEMORANDUM TO:

Marissa Bailey, Director  
Division of Construction Oversight  
Region II

Mark Miller, Director  
Division of Reactor Projects  
Region II

Mark Franke, Director  
Division of Reactor Safety  
Region II

FROM:

Michael King, Director /RA/  
Vogtle Project Office  
Office of Nuclear Reactor Regulation

Chris Miller, Director  
Division of Reactor Oversight  
Office of Nuclear Reactor Regulation

SUBJECT:

TRANSITION TO REACTOR OVERSIGHT PROCESS  
FOR VOGTLE ELECTRIC GENERATING PLANT,  
UNITS 3 AND 4

The Vogtle Project Office and the Division of Reactor Oversight have worked with Region II to develop a plan to provide an effective and efficient transition of the Vogtle Electric Generating Plant, Units 3 and 4, from the Construction Reactor Oversight Process to the Reactor Oversight Process. The staff anticipates that it will continue to refine this plan as it gains experience with the transition process. The Vogtle Readiness Group will approve any deviations from this transition plan and determine whether future updates are warranted.

Enclosures:

1. Reactor Oversight Process Transition Plan for Vogtle Electric Generating Plant, Units 3-4
2. Figure 1 Transition to Reactor Oversight Process
3. Figure 2 Integrated Inspection Plan for Vogtle Units 1-4
4. Table 1 Performance Indicator Validity Summary

CONTACT: Andrea M. Johnson, NRR/VPO  
301-415-2890

Transition Memo: [ML20191A383](#)

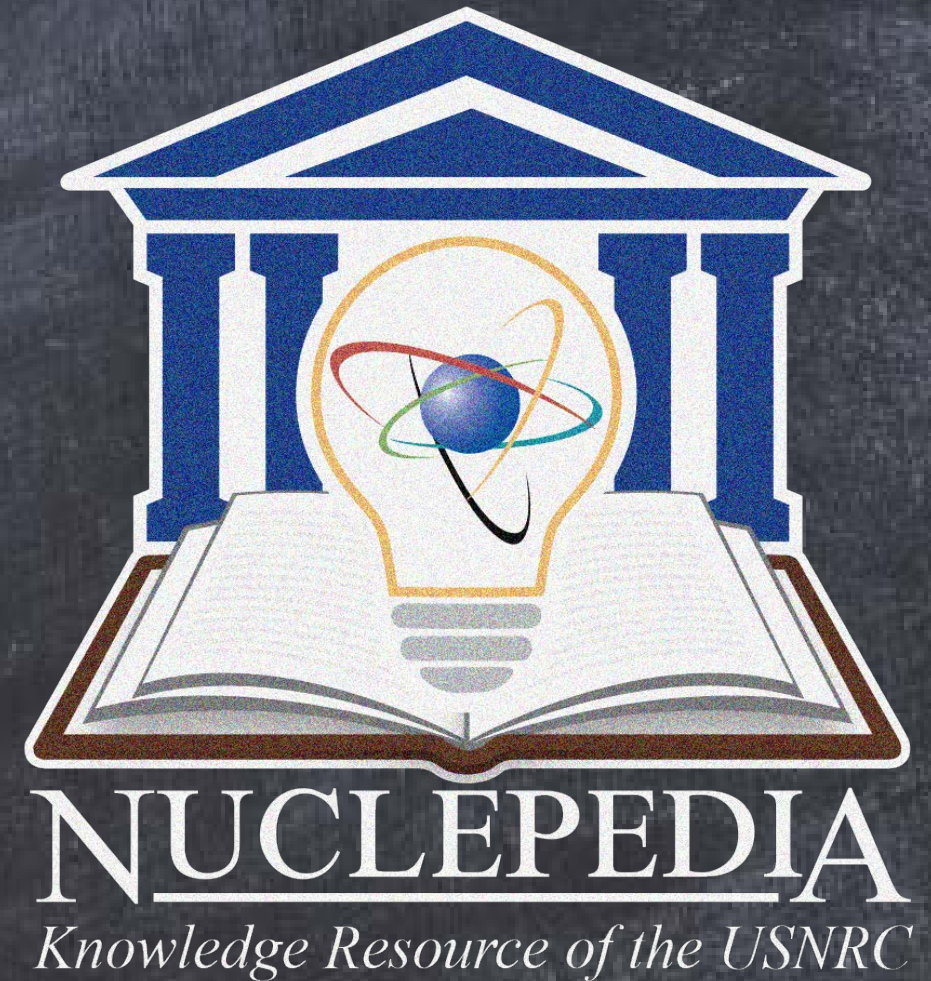
\* This preview is not indicative of current data.



Vogtle 3&4 Resident Inspectors

...IS PREPARED to ensure a successful transition from construction to operation.

- Improve the effectiveness and efficiency of future construction programs
- Leveraging Nuclepedia to store feedback from staff across the agency, industry stakeholders, and the public



...IS EMBARKING ON A HOLISTIC LESSONS-LEARNED to capture Part 52 experience and inform future construction programs.



# Advanced Reactor Preparedness

## Mohamed Shams

Director, Division of Advanced Reactors and  
Non-Power Production and Utilization Facilities,  
NRR





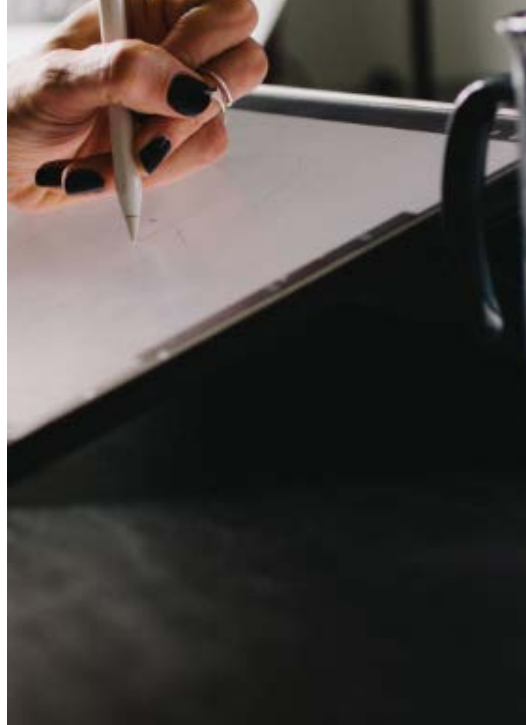
# NRC is Building an Agile Advanced Reactor Program



# Transforming the Regulatory Framework into a Modern, Risk-Informed Approach



Continuing  
extensive  
engagement with  
stakeholders



Evolving Part 53 &  
developing risk-informed  
guidance



Adhering to the  
principles of the  
Advanced Reactor  
Policy Statement



Completing key  
rulemaking  
activities

# Safely Regulating Advanced Reactor Technologies Now and Into the Future



**Engaging in licensing reviews**



**Active in preapplication engagements**



**Using core teams to perform risk-informed reviews**



**Creating tools to leverage data, optimize execution and enhance transparency**



# Partnering for Success

## We are Strengthening Readiness through Research

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Reference Plant Models  
Code Development  
Technical Basis for  
Consensus Standards

## Collaborating Internationally to Enhance Licensing the Reactors of the Future

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US - Canada MOC  
IAEA - SMR Regulators Forum  
NEA - Working Group on the  
Safety of Advanced Reactors

# Security Considerations for Advanced Reactors

**Steven Vitto,**  
Security Specialist, Division of Physical and  
Cyber Security Policy, Office of Nuclear Security  
and Incident Response



## NSIR Remains Focused On:

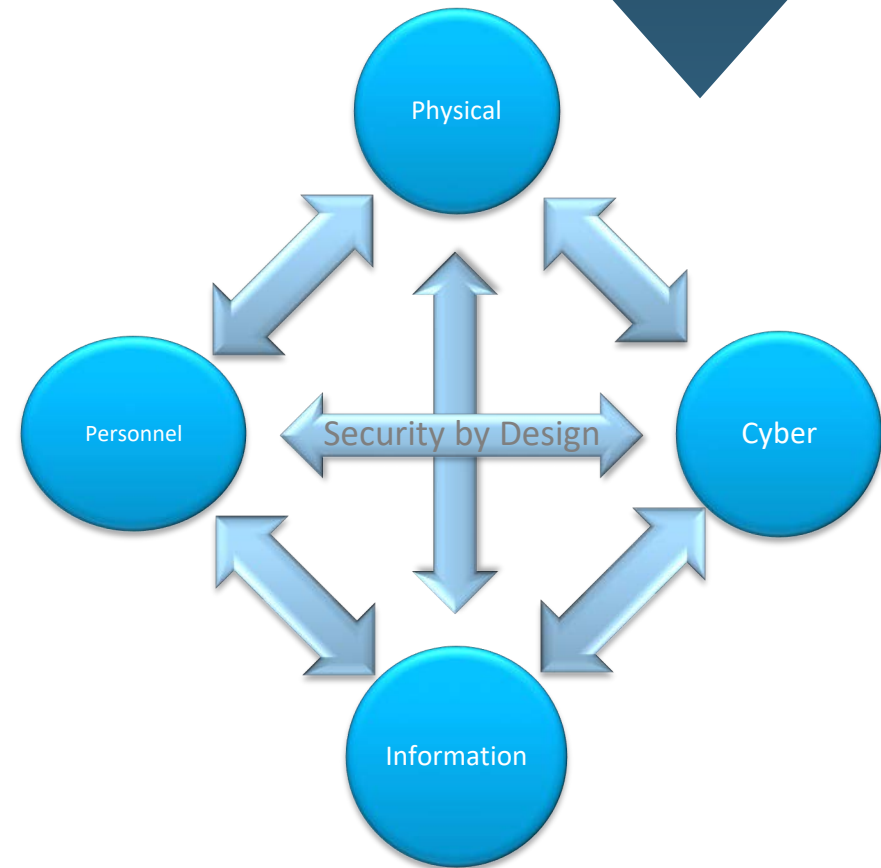
- Safety and security of the current operating fleet
- Establishing a modern infrastructure for advanced reactors





# Developing a Consequence-Based Approach to Security

- Variety of potential reactor designs
- Radiological consequence provides a benchmark for the proposed security framework
- Two key rulemakings:
  - Alternative Physical Security Requirements for Advanced Reactors
  - Part 53 Risk-Informed, Technology Inclusive Regulatory Framework for Advanced Reactors



# Prepared to Regulate the Nuclear Technology of the Future

- Cultivating a team of interdisciplinary experts
- Maintaining open engagement with stakeholders
- Applying the right skill sets and resources to arrive at risk-informed and technically sound approaches

# Early and Frequent Stakeholder Engagement is Critical





# Delivering Success in Our Work and Supporting National Priorities

- Continued focus on new technologies and industry trends
- Cyber security to protect critical digital assets
- Ongoing threat assessment through engagement with interagency and law enforcement partners



# Closing Remarks

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Deputy Executive Director for Reactor and  
Preparedness Programs, Office of the Executive  
Director for Operations



# Acronyms

CNSC	Canadian Nuclear Safety Commission
HQ	Headquarters
IAEA	International Atomic Energy Agency
ICN	Inspection Closure Notice
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
MOC	Memorandum of Cooperation
NEA	Nuclear Energy Agency
NRR	Office of Nuclear Reactor Regulation
NRC	U.S. Nuclear Regulatory Commission
SIT	Special Inspection Team
SMR	Small Modular Reactor
SNC	Southern Nuclear Company