STRATEGIC PROGRAMMATIC OVERVIEW OF THE OPERATING REACTORS AND NEW REACTORS BUSINESS LINES AND RESULTS OF THE AGENCY ACTION REVIEW MEETING

Commission Briefing

September 30, 2020

Opening Remarks

Dan Dorman

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

AGENDA
Panel 1

Operating Reactors and New Reactors Business Lines

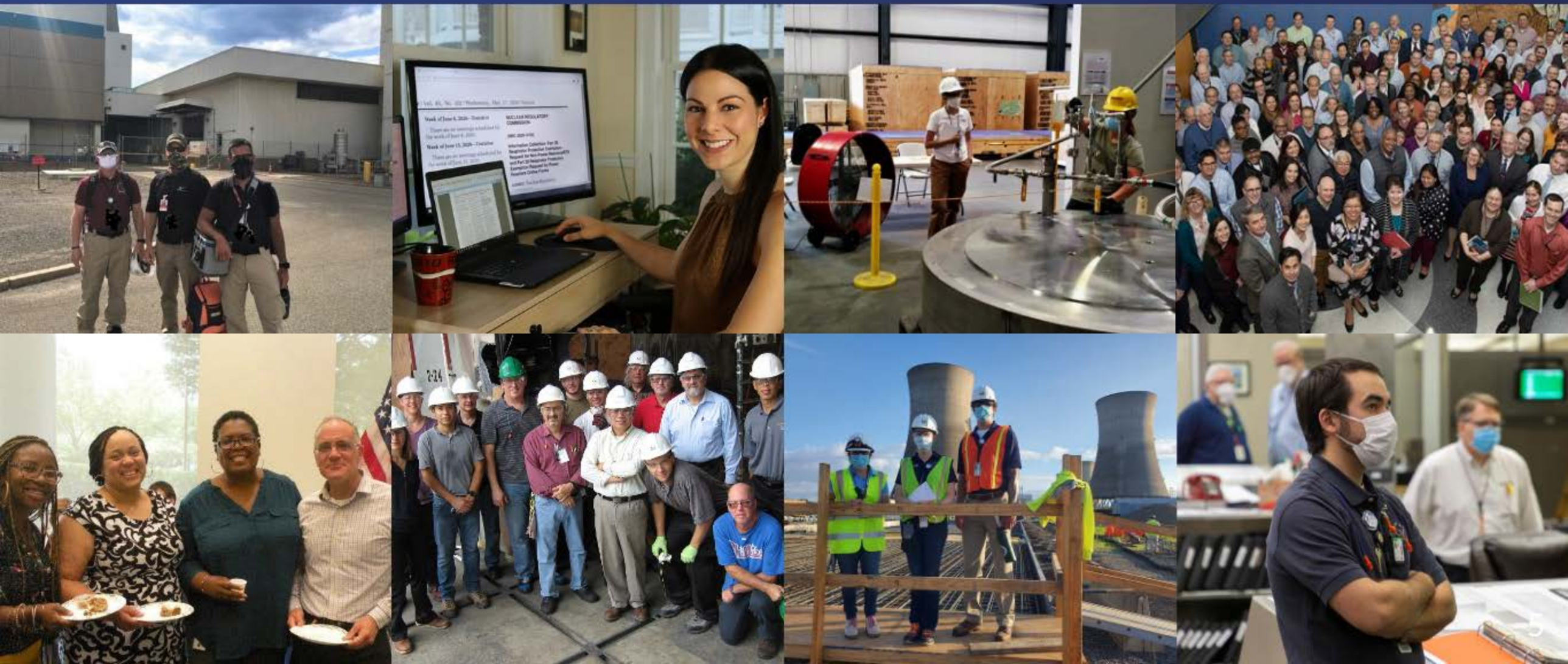
Dan Dorman	Opening Remarks Closing Remarks: Focusing on Our Future
Ho Nieh	Nuclear Reactor Safety Program: Vision and Priorities, Key Successes, and Regulating the Technology of the Future
Maggie Tobin	Ensuring Safety in a Dynamic Environment
Stephanie Coffin	Benefiting from Research Partnerships to Better Position the NRC to Review New Nuclear Technologies
Shaun Anderson	Innovation in the Nuclear Reactor Safety Program

Nuclear Reactor Safety Program: Vision and Priorities, Key Successes, and Regulating the Technology of the Future

Ho Nieh

Director, Office of Nuclear Reactor Regulation (NRR)

All NRC Offices Contribute to the Success of the Nuclear Reactor Safety Program



We Make **SAFE** Use of Nuclear Technology **POSSIBLE**

One Unifying Vision

- Safety and Security Mission
- Our People
- Principles of Good Regulation
- NRC Values
- Innovation and Transformation

Ensuring Safety and Security through Effective Oversight, Licensing, and Incident Response

The Vogtle Project Office Ensures the Safe New Construction Commissioning of Vogtle Units 3 and 4

Photos Courtesy of Southern Company

Timely Licensing of New Technologies: NuScale Small Modular Reactor Design

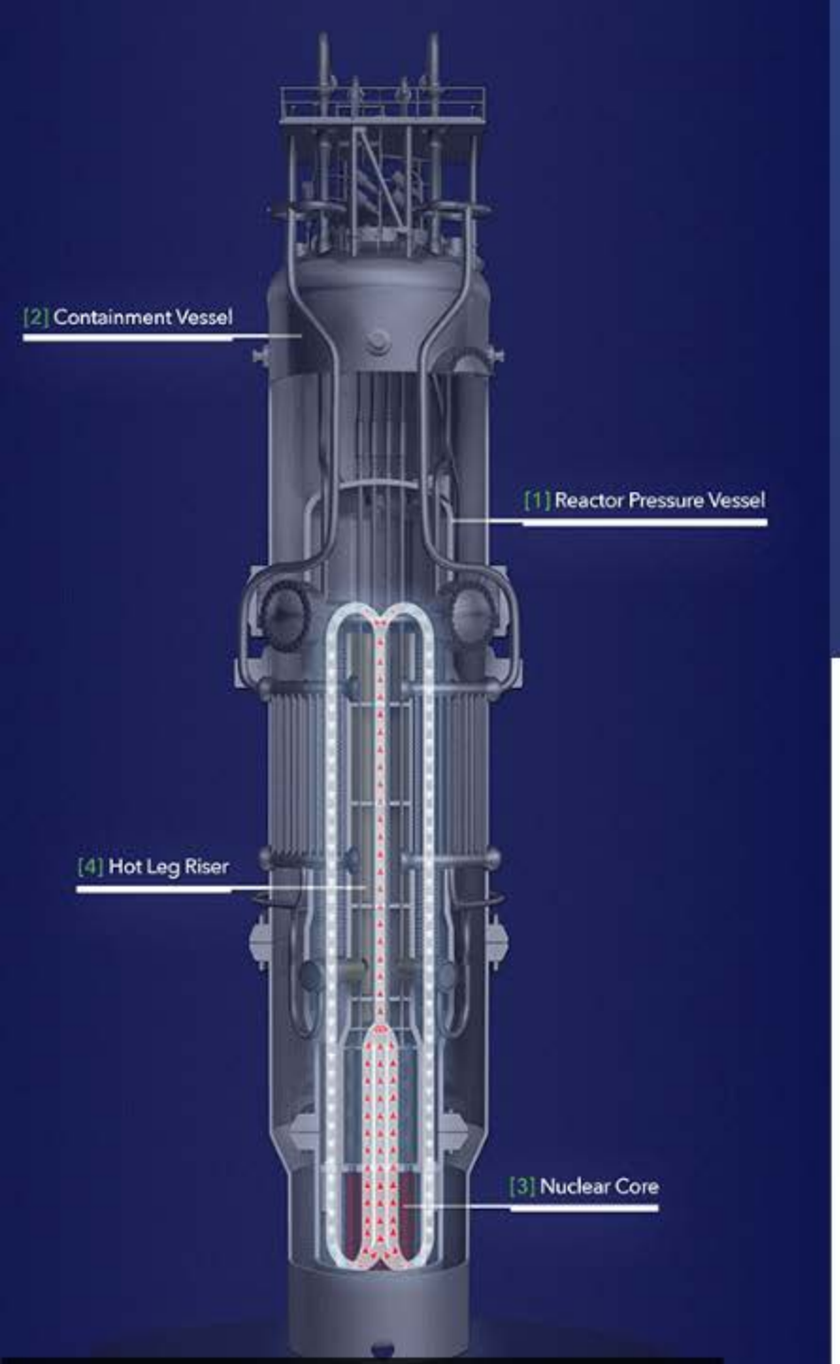


Photo Courtesy of NuScale Power

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August 28, 2020

NRC Issues Final Safety Evaluation Report for NuScale Small Modular Reactor

The Nuclear Regulatory Commission has issued a final safety evaluation report for NuScale's small modular reactor design. This meets the agency's original 42-month technical review schedule and demonstrates the NRC's commitment to timely licensing of safe technologies for new, advanced reactors. The NRC is preparing a rulemaking to certify the design.

Subsequent License Renewal: Ensuring Safe Operation Beyond 60 years

Ensuring Readiness for Licensing and Safe Deployment of Advanced Reactors in the United States

We Are a Modern Risk-Informed Regulator

Focus more regulatory attention on issues of greatest significance and use modern business technologies and data tools to deliver value in accomplishing our mission

Risk-Informed Decisions

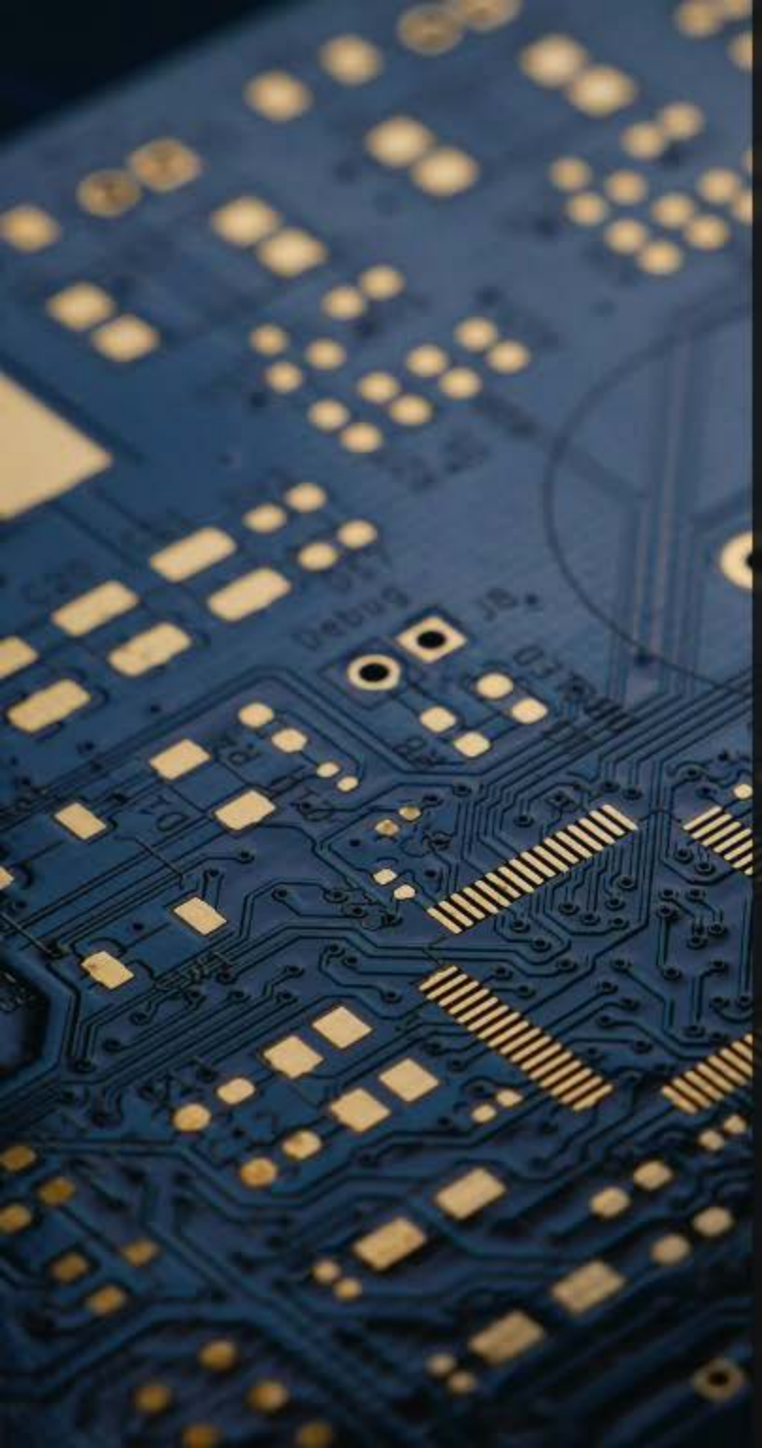
Be riskSMART

Innovation Accelerator

EMBARK VENTURE STUDIO

Data-Driven Decisions

MAP MISSION ANALYTICS PORTAL



We Are Prepared to Regulate the Nuclear Technology of the Future

Advanced reactors

Digital instrumentation and control

Accident tolerant fuel

Advanced manufacturing

Ensuring Safety in a Dynamic Environment

Maggie Tobin

Senior Resident Inspector, North Anna Power Station, Region II

Executing the Reactor Oversight Process (ROP)
Safety and Security Is Inspectors Top Priority

Inspectors execute the NRC mission by monitoring onsite activities

Adapting to change is vital

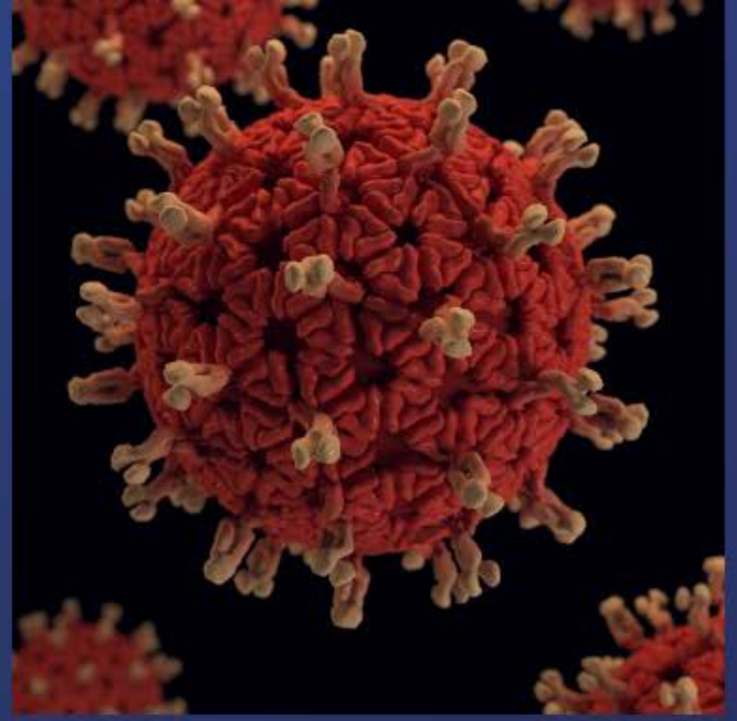
Conducting Robust, Risk-Informed, Safety-Focused Inspections

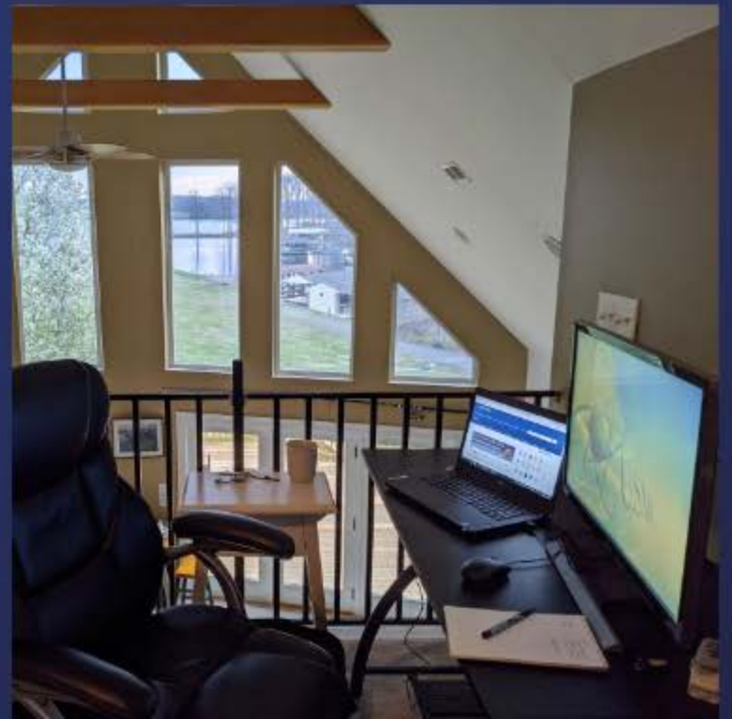
ROP enables inspectors to follow-up on safety or security Issues

ROP is risk-informed and performance-based

Inspectors Implement Continual ROP Improvements

- Collaboration between inspectors, regions, and headquarters offices
- Restructuring sample requirements in inspection procedures
- Very Low Safety Significance Issue Resolution (VLSSIR) process





New Technology Enables Enhanced Inspection

- Inspector tablet pilot program
- Skype for business
- Inspection Sample Tracking and Reporting tool (iSTAR)
- NRC risk assessment tools
- Licensee provided tools
- Risk-informed approach to remote inspection during COVID-19 public health emergency

Inspectors Execute the NRC Mission

- Positive impact on safety through risk-informed observations and findings
- Incident response capability
- Interfacing with site personnel and local community

Inspector Added Value

Licensing basis change
Key assumption: Baseload operations

Flexible power operations

Inspector identifies issue:
Licensee performs analysis to confirm continued operability

Benefiting from Research Partnerships to Better Position the NRC to Review New Nuclear Technologies

Stephanie Coffin

Deputy Director, Office of Nuclear Regulatory Research

Partnership with Department of Energy Nuclear Energy Innovation Capabilities Act

Be Ready Mindset

- Coordinated Activities
- Identify and Close Research Gaps
- Personnel exchanges

Versatile Test Reactor

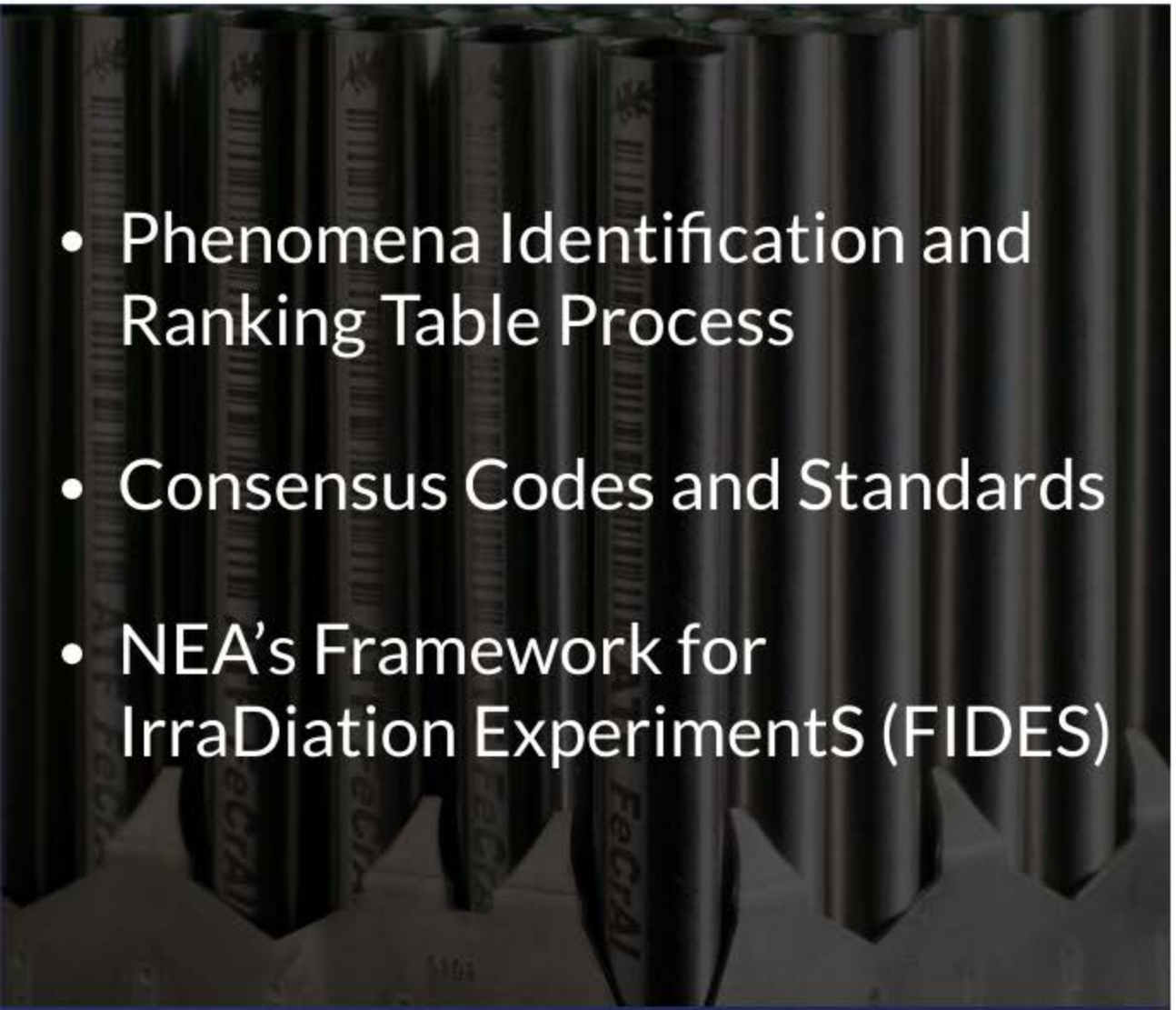
Light Water Reactor Sustainability

National Reactor Innovation Center

Nuclear Energy Advanced Modeling and Simulation

Transformational Challenge Reactor

Other Domestic and International Partnerships
Independent and Engaged



- Phenomena Identification and Ranking Table Process
- Consensus Codes and Standards
- NEA's Framework for IrraDiation ExperimentS (FIDES)

ANS

ASME
SETTING THE STANDARD

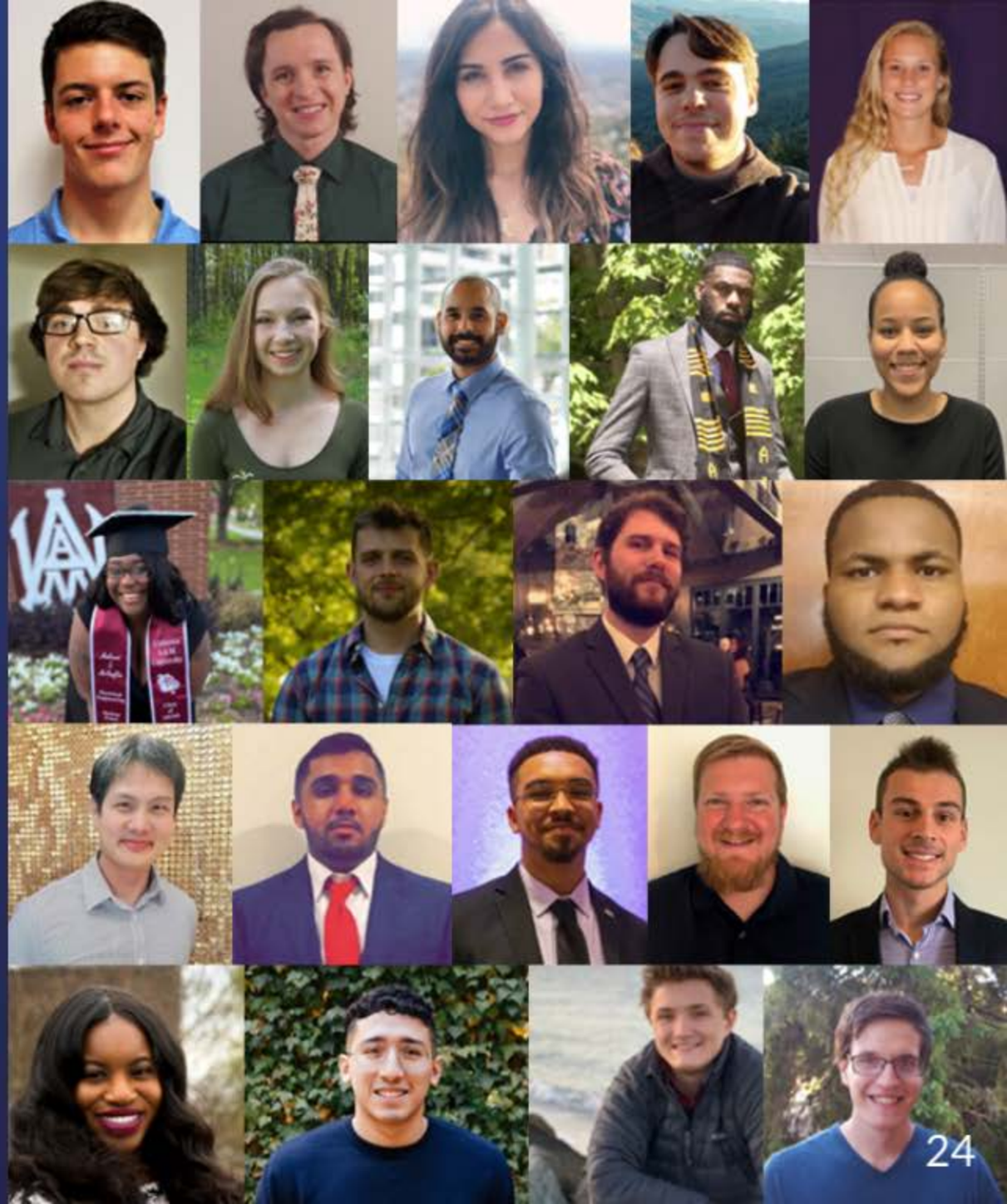
NEA
Nuclear Energy Agency

IEEE

EPRI
ELECTRIC POWER RESEARCH INSTITUTE

Integrated University Program
Technology and Talent Pipeline

- Scholarships, fellowships, and faculty development
- Mission-related research and development grants
- Agency's Nuclear Regulator Apprenticeship Network



Innovation in the Nuclear Reactor Safety Program

Shaun Anderson

Managing Director, EMBARK Venture Studio, NRR


EMBARK
VENTURE STUDIO

VISION

Give staff the courage to make real change

MISSION

We are creative catalysts who remove barriers to innovation and launch initiatives that improve the way we work to make SAFE use of nuclear technology POSSIBLE

EMBARK VENTURE STUDIO

OPERATING MODEL

No two EMBARK projects are alike - so how we engage varies.

We ENABLE

We ADVISE

We PARTNER

We CREATE

We TEACH

We **INSPIRE.**

EMBARK VENTURE STUDIO

EMBARK VENTURE STUDIO DEPARTMENTS

THE GARAGE

The Garage is our process improvement effort. It is the place where we tune up our processes and upgrade our procedures to transform the way we regulate for the nuclear future. We are looking at our approach and prototyping new ideas.

NEXTGEN DATA

NextGen Data is focused on taking data to the masses, leveraging the data we have in innovative ways to bring transparency and greater understanding for better regulatory decisionmaking.

NEUROLOGY

Neurology is about understanding risk, overcoming fear of failure, challenging the status quo, and breaking down barriers. We envision an Agency that proactively and creatively adapts to our environment while staying true to our mission.

#HASHtagChange

HASHtagChange is all about improving the experience for our internal and external stakeholders and providing more effective tools that enhance the way we interact with each other.

ASME Code Rulemaking

Request for Confirmatory Information

Web-based Online Submissions

EVALUATING THE *"BUSINESS AS USUAL"*

Mission Analytics Portal

Risk Informed Process for Evaluations

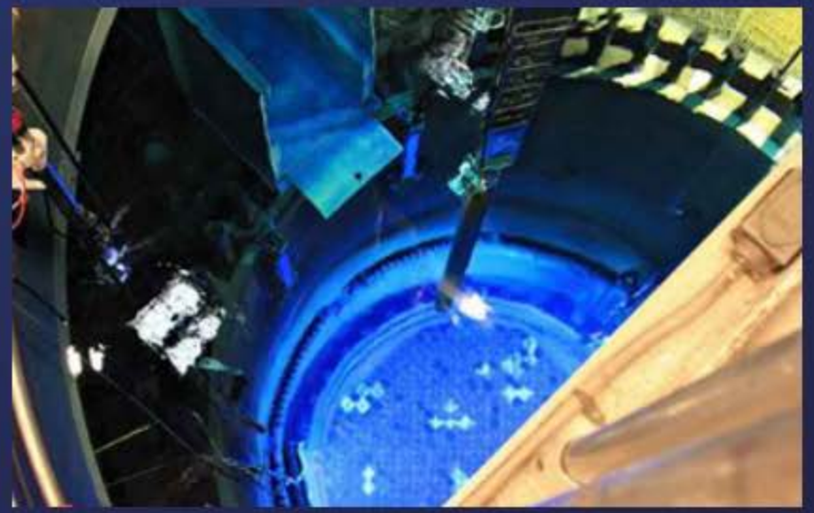
Subsequent License Renewal Enhancements

Closing Remarks: Focusing on the Future

Dan Dorman

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

Regulating New Technologies



Investing in Our People

NRAN

Training

Workforce Planning

Acronyms

ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
COL	Combined License
COVID-19	Coronavirus Disease 2019
DOE	Department of Energy
EPRI	Electric Power Research Institute
FIDES	Framework for IrraDiation ExperimentS
FLEX	Diverse and Flexible Mitigating Capability
FOF	Force on Force
IEEE	Institute of Electrical and Electronics Engineers
ISTAR	Inspection Sample Tracking and Reporting
MAP	Mission Analytics Portal

Acronyms

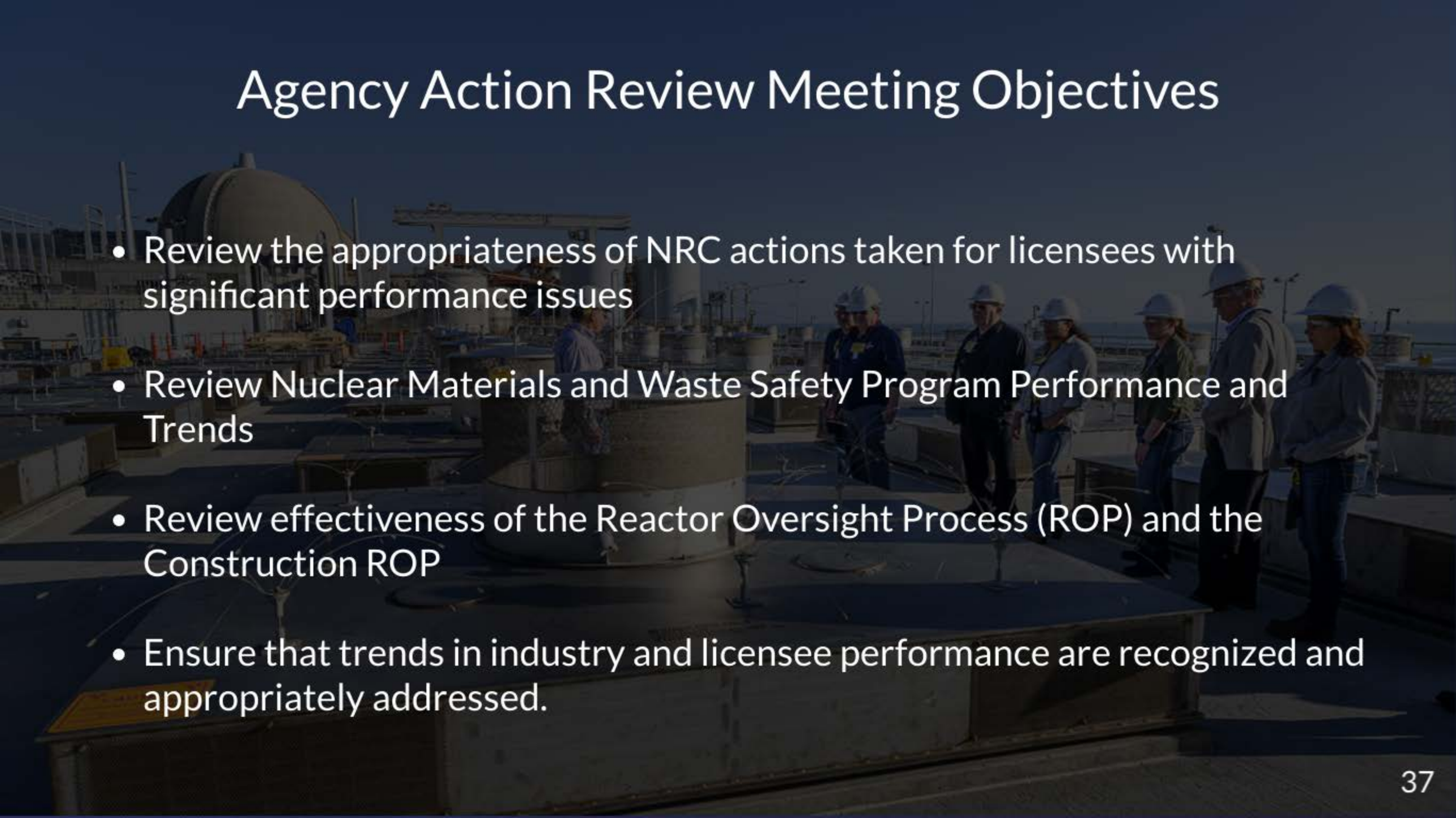
MOU	Memorandum of Understanding
NEA	Nuclear Energy Agency
NEIMA	Nuclear Energy Innovation and Modernization Act
NRAN	Nuclear Regulator Apprenticeship Network
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OpE	Operating Experience
PRA	Probabilistic Risk Assessment
RES	Office of Nuclear Regulatory Research
ROP	Reactor Oversight Process
SMR	Small Modular Reactor
VLSSIR	Very Low Safety Significance Issue Resolution

Opening Remarks

Dan Dorman

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

Agency Action Review Meeting Objectives



- Review the appropriateness of NRC actions taken for licensees with significant performance issues
- Review Nuclear Materials and Waste Safety Program Performance and Trends
- Review effectiveness of the Reactor Oversight Process (ROP) and the Construction ROP
- Ensure that trends in industry and licensee performance are recognized and appropriately addressed.

AGENDA
Panel 2

Results of the Agency Action Review Meeting (AARM)

Dan Dorman	Opening Remarks Closing Remarks
Kevin Williams	Nuclear Materials and Waste Safety Program Performance and Trends
Chris Miller	ROP Self-Assessment Results and Inspection Finding Trends
Mike King	Construction ROP and Transition to ROP

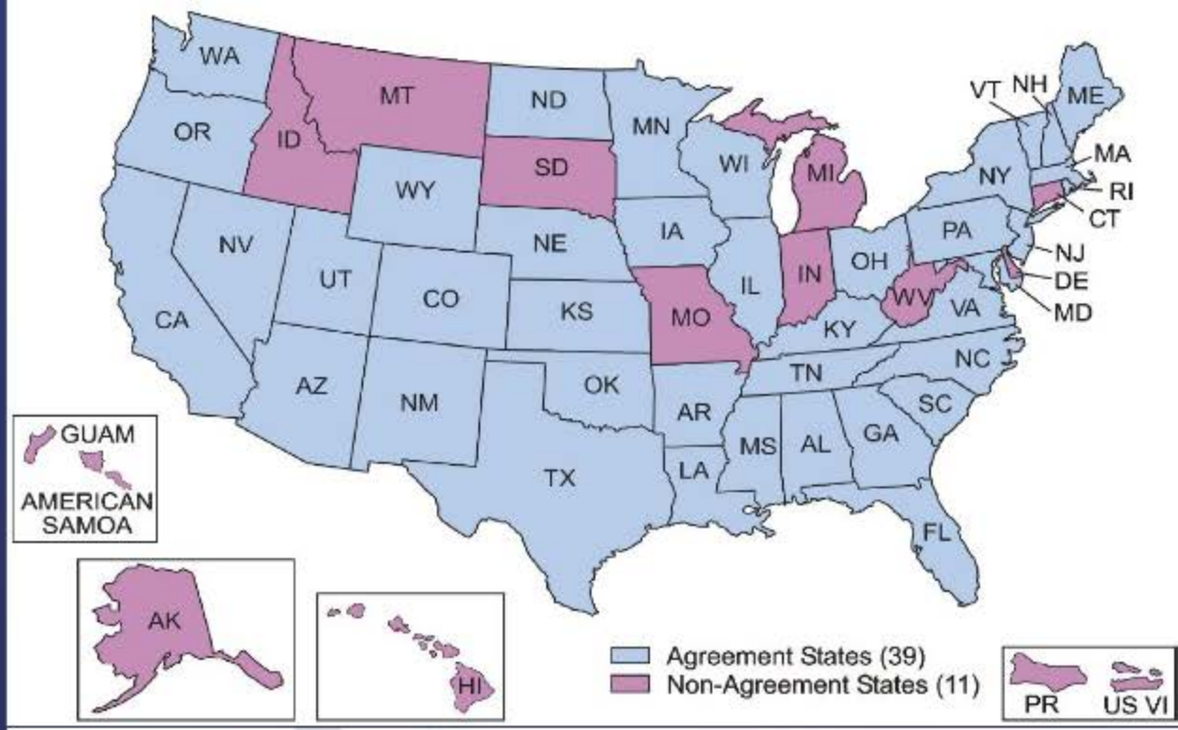
Nuclear Materials and Waste Safety Program Performance and Trends

Kevin Williams

Director, Division of Materials Safety, Security, State, and Tribal Programs, Office of Nuclear Material Safety and Safeguards

Utilizing a Robust Performance Evaluation Process

- Systematic review of information to identify significant:
  - Operational performance issues
  - Licensee performance issues
  - NRC program issues/gaps
- No nuclear materials licensee met the significant performance issue criteria in SECY-11-0132 for FY19



Reviewing and Evaluating Strategic Performance Measures on an Ongoing Basis

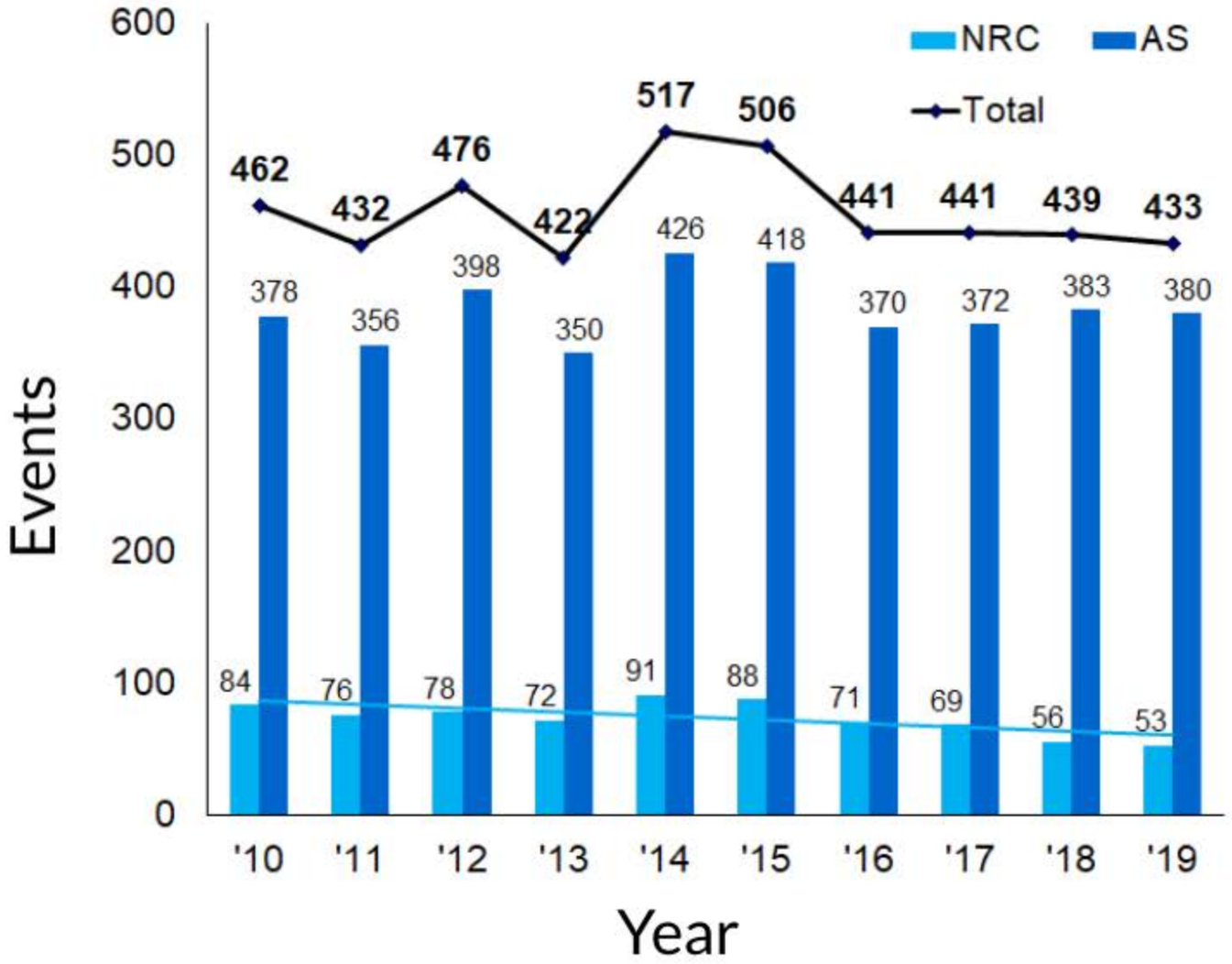
- FY19 Agency performance results were reported in the FY21 Congressional Budget Justification (CBJ)

- Safety Goal
  - 1 occurrence (target ≤ 3)

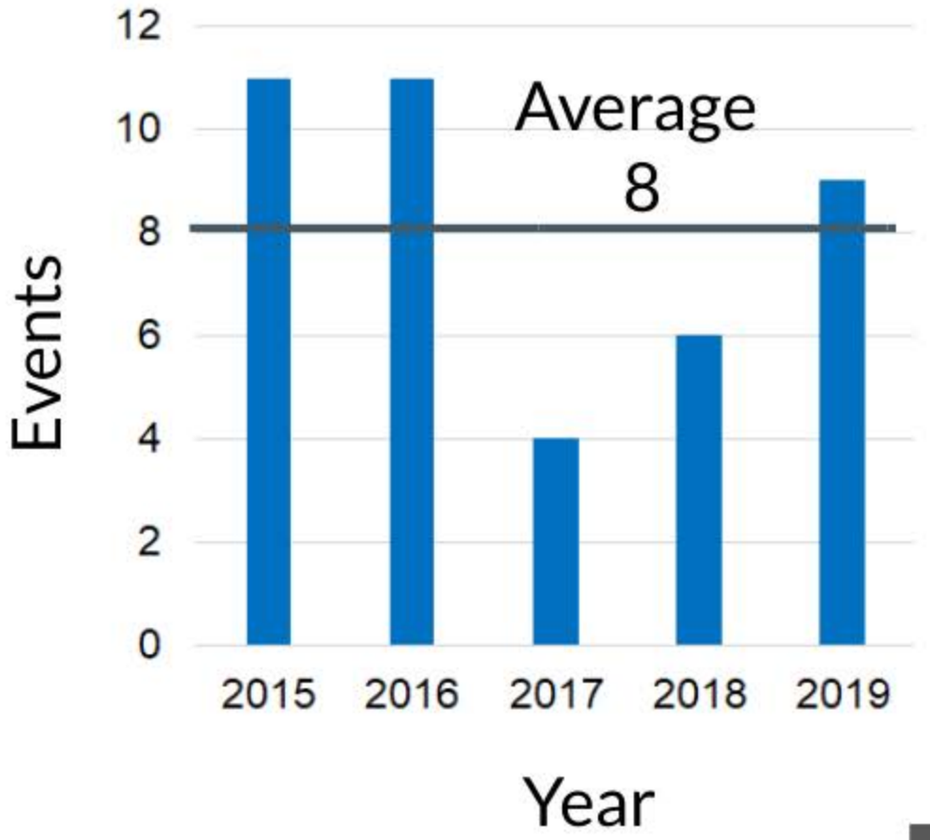
- Security Goal
  - 1 occurrence (target = 0)

Trends Analysis

Nuclear Material Events Per Year



Fuel Cycle Operating Experience Events Per Year



Escalated Enforcement Actions

- 40 NRC escalated enforcement actions in FY19
- Escalated enforcement actions in FY19 increased by 3 (+8%) from FY18 (37 in FY18 up to 40 in FY19)
- FY19 actions primarily involved gauge users and radiographers (7 and 12 actions, respectively)
- Enforcement policy update discussions are ongoing in FY20

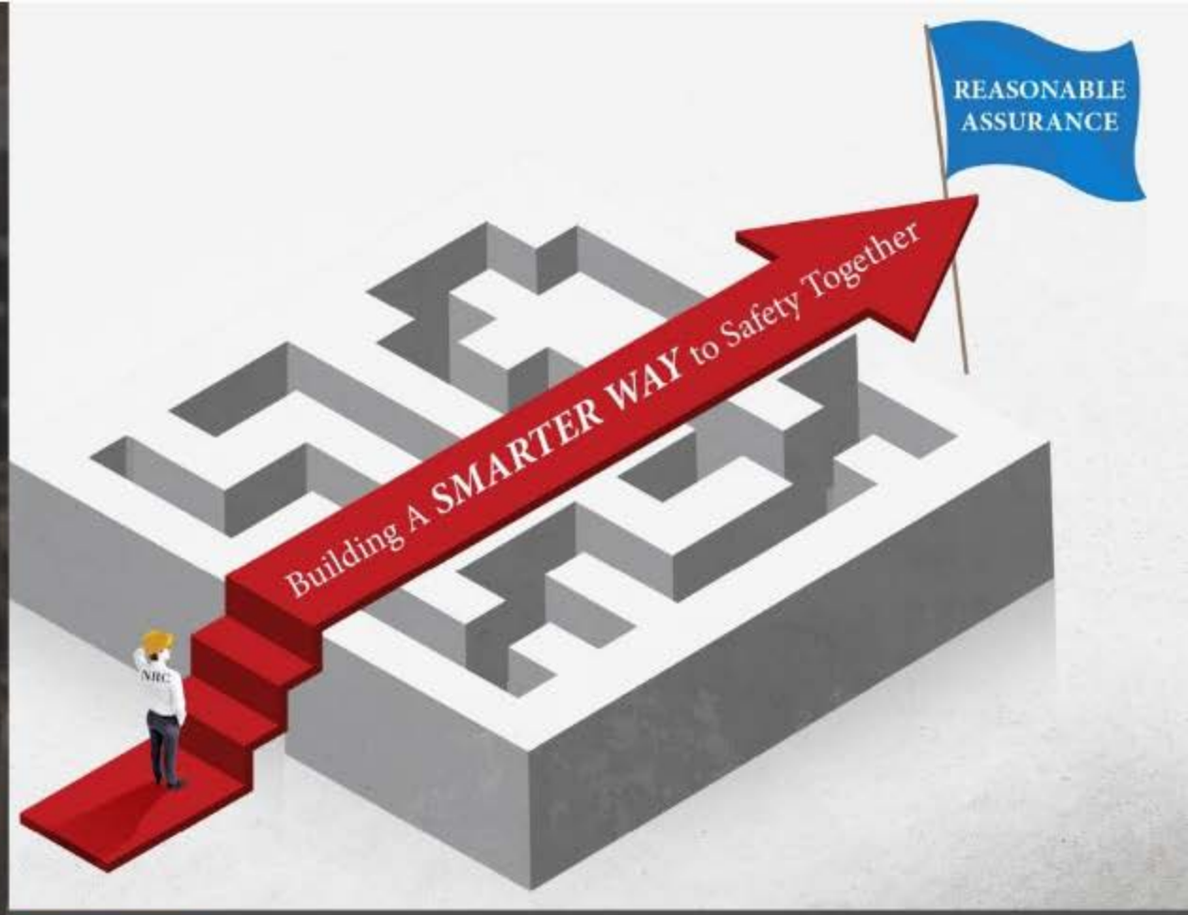
Abnormal Occurrences

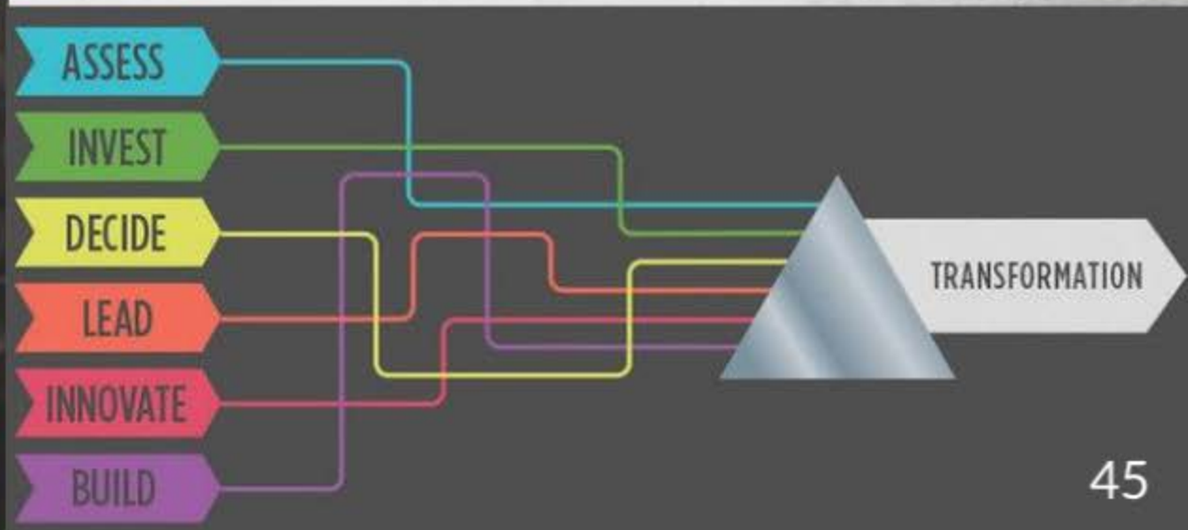
FY19 abnormal occurrences (AOs) reported to Congress

- 1 Theft of radiography cameras
- 1 Overexposure
- 7 Medical events

Programmatic Innovations

- Building A Smarter Fuel Cycle Program
- Enhanced Independent Spent Fuel Storage Installation inspection program
- Innovation and risk informed evolution of materials licensing and inspection programs- finished phase II, started phase III (ongoing FY20)





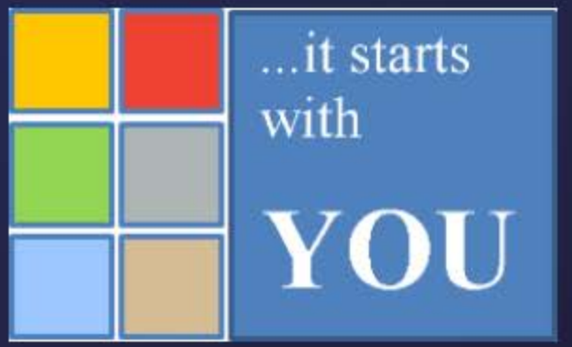
Summary of Program Performance

- For FY19, NRC met all safety strategic goal performance metrics. A single event caused NRC to not meet the security strategic goal.
- No significant trending issues
- Invested in innovation and risk informing across all NMSS program areas

Principles of Good Regulation

The NRC adheres to the following Principles of Good Regulation

Be riskSMART



ROP Self-Assessment Results and Inspection Finding Trends

Chris Miller

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

The CY19 ROP Self-Assessment Determined that the Reactor Oversight Process Remains Effective

ROP self-assessment activities

- ROP performance metrics
- ROP program area evaluations
- Effectiveness review of the cross cutting issues program

Was the ROP implemented per governance documents and uniformly?

Did the ROP meet its Program Goals?

Did the ROP meet its Intended Outcomes?

Did ROP execution adhere to the NRC Principles of Good Regulation?

How do we know that the ROP continues to be effective?

The Revised ROP Self-Assessment Program Provides a Robust, Data-Driven Evaluation of Effectiveness

CY20 ROP Self-Assessment Activities

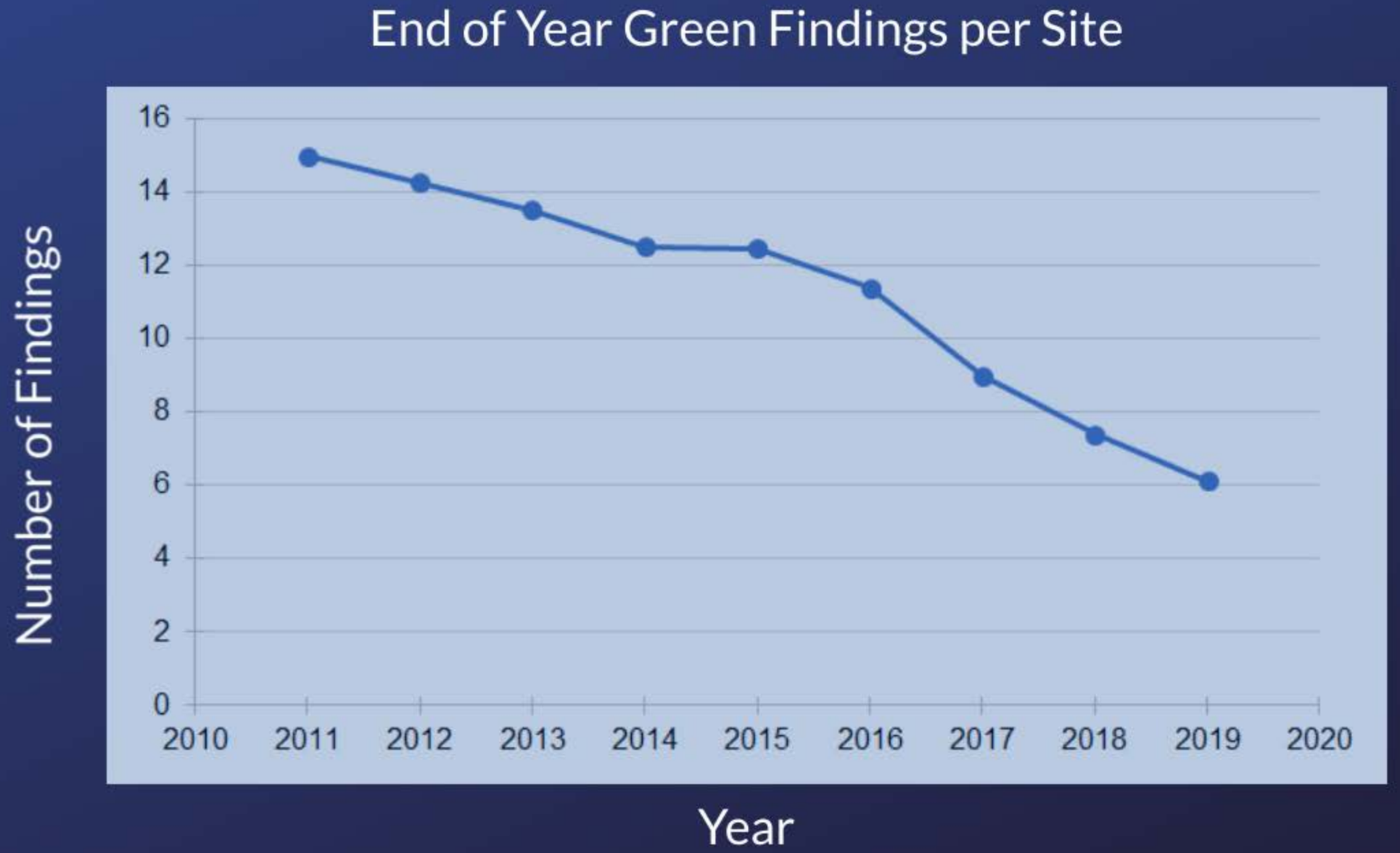
- Performance metrics & data trending
- Program area evaluations
- Region IV implementation audit
- 2 effectiveness reviews
- Continuous monitoring of trends in baseline inspection procedure implementation

Photo Courtesy of Southern Company

Inspection Findings Trend in CY19

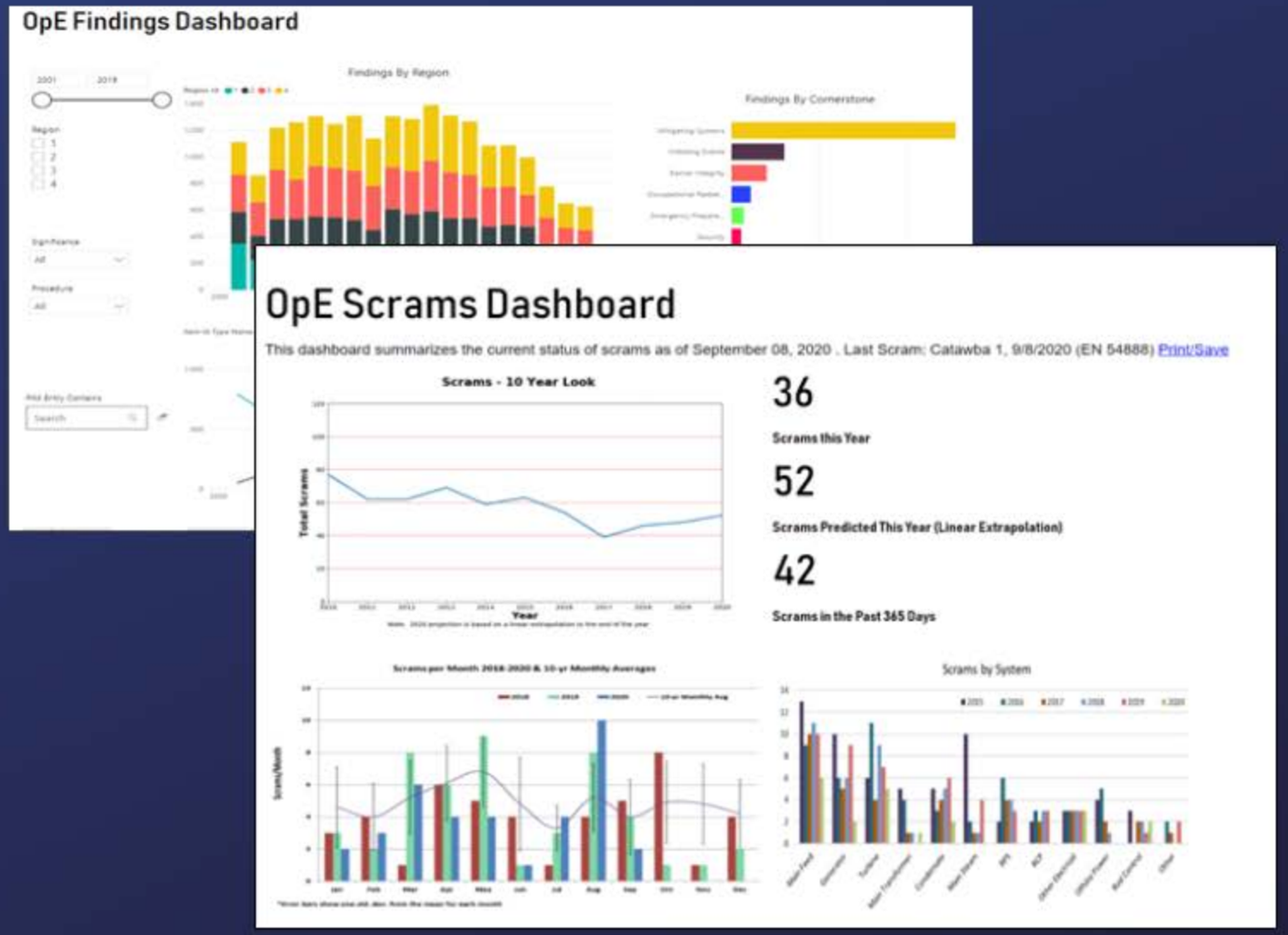
- NRC findings per site continue to decrease from CY2015 levels
- Staff review of potential drivers for the downward trend
- Agency oversight programs are effective

NRC-Identified Findings Account for the Downward Trend



Leveraging Data Analytics to Support Data-Driven Oversight Decisions

- Continuous, proactive data monitoring and analysis across all ROP program areas
- Increasing use of data in decision making from resident inspectors to regional/program office management



Construction Reactor Oversight: COP and Transition to ROP

Mike King

Director, Vogtle Project Office

Construction Reactor Oversight

Continuous Improvement through Self-Assessments

Photo Courtesy of Southern Nuclear

- Changed the ITAAC targeting for improved inspection flexibility
- Brought guidance for minor performance deficiencies in line with the ROP and ITAAC maintenance requirements
- Adjusted inspection procedures to ensure enough resources and time to complete the remaining inspection activities

Strengthened Inspection Planning and Coordination

Photo Courtesy of Southern Company

- Increased communication to promote schedule awareness and reduce down time
- All large inspections have been identified and scheduled with the licensee
- All Regions continue to support Region II resource needs

Adapting to the Challenges of COVID-19

Inspection and construction schedule impacted by COVID-19

NRC staff revising inspection activities for protection of staff and to maintain effective oversight of construction

Preparing for anticipated surge in inspection workload in late Fall 2020

Prepared for Transition to Operations

Photos Courtesy of Southern Company

- Finalized plan informed by lessons learned from Watts Bar transition
- Adjusted baseline inspection program appropriate for the simpler AP1000 design

Leveraging Today To Prepare for the Future

Envisioning cROP for small modular reactors and advanced reactors

Lessons learned are informing ongoing new reactor licensing activities

Closing Remarks

Dan Dorman

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

NRC staff affirmed the appropriateness of agency actions and the effectiveness of our oversight programs

Acronyms

AARM	Agency Action Review Meeting
ACMUI	Advisory Committee on the Medical Uses of Isotopes
AO	Abnormal Occurrence
CBJ	Congressional Budget Justification
cROP	Construction Reactor Oversight Process
CY	Calendar Year
FY	Fiscal Year
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ITAAC	Inspections, Tests, Analyses, and Acceptance Criteria
NMED	Nuclear Materials Event Database
NMSS	Office of Nuclear Material Safety and Safeguards
SDP	Significance Determination Process
VRG	Vogtle Readiness Group