Strategic Programmatic Overview of the Operating and New Reactor Business Lines

November 2, 2023

Daniel Dorman

Executive Director for Operations

Introduction

Operating Reactor Business Line

ANDREA VEIL

Strategic Priorities and Successes for the Operating Reactor Business Line

BILL ORDERS

Readiness to License Power Uprates

BRIAN SMITH

License Renewal Program Update and Future Enhancements

PHIL MCKENNA

Implementation of Reactor Oversight Process Enhancements

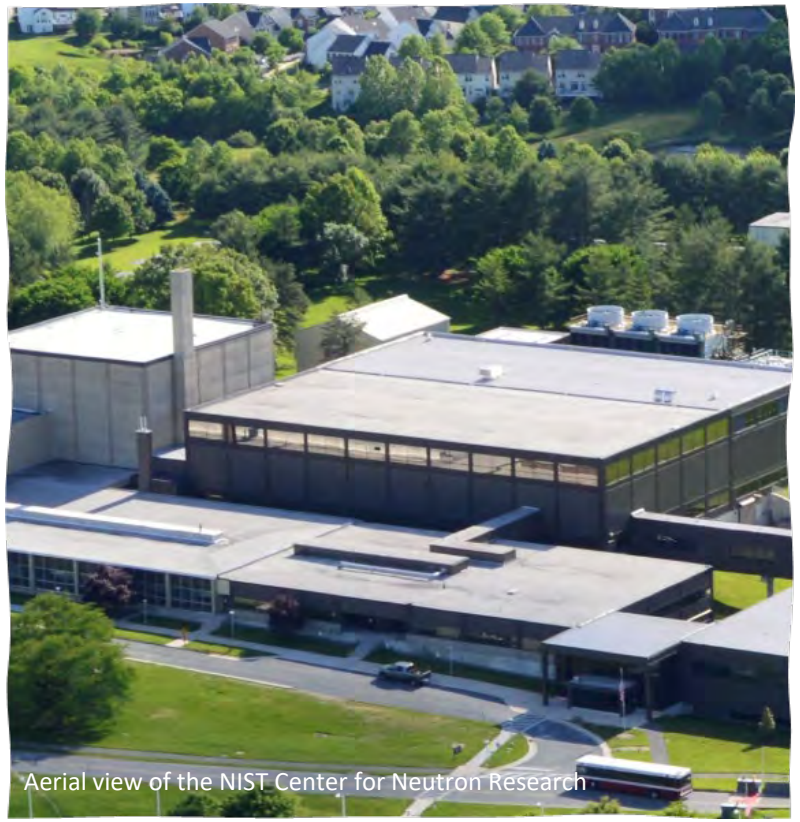
LADONNA SUGGS

Resident Inspector Health – Recruitment and Retention

Andrea Veil

Director, Office of Nuclear Reactor Regulation

Strategic Priorities and Successes for the Operating Reactor Business Line



Aerial view of the NIST Center for Neutron Research

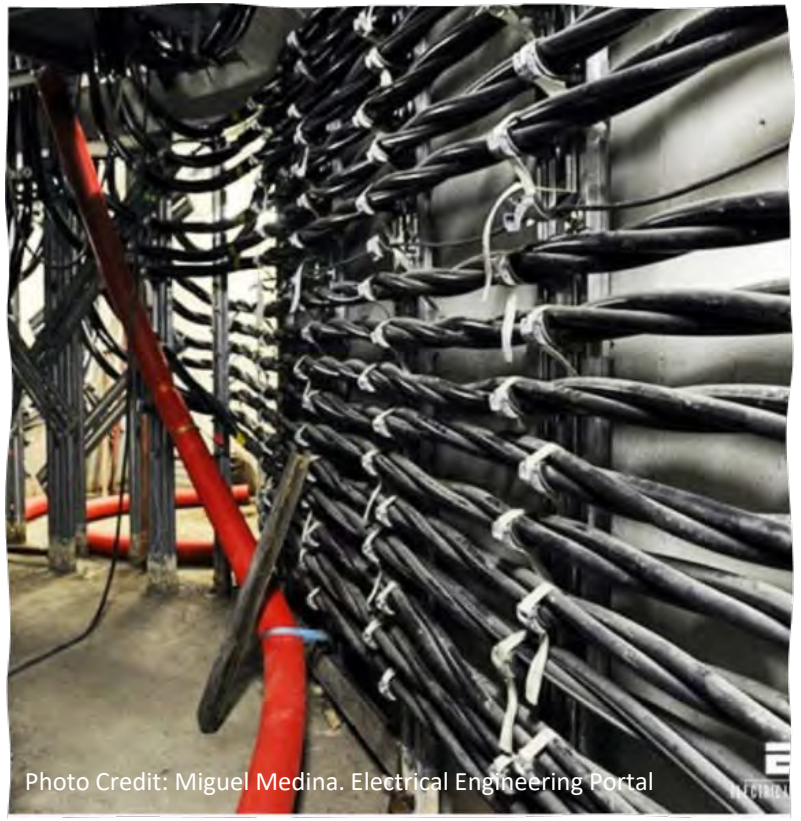
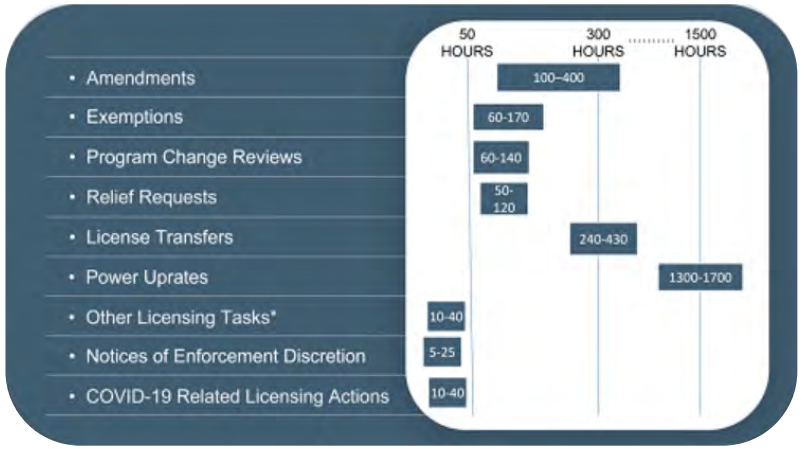


Photo Credit: Miguel Medina. Electrical Engineering Portal

Continued Focus to Support Nuclear Safety Issues for the Operating and Non-Power Reactor Fleet

Strategizing for an Increase in Workload and External Interest



NRC's Resource Estimator for Operating Reactor Licensing

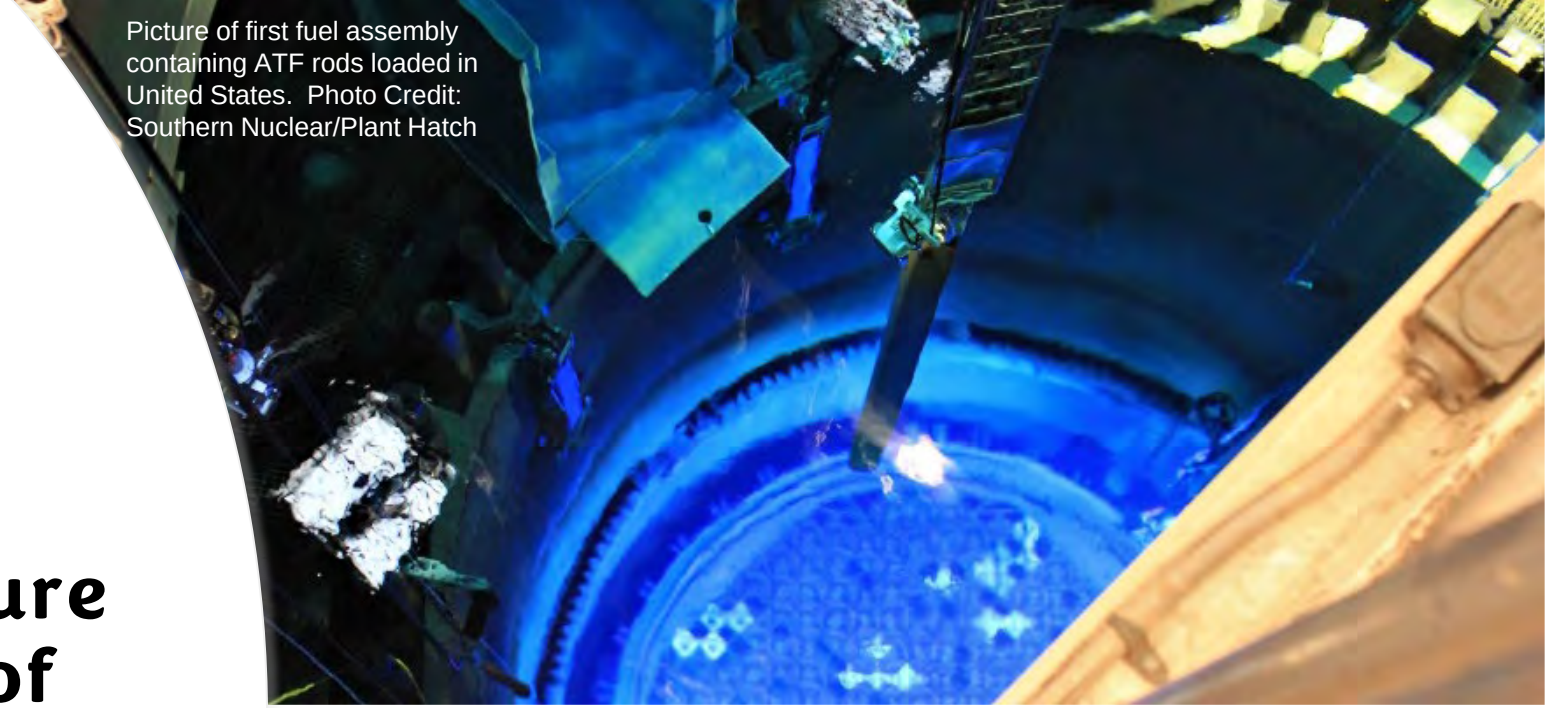
Taken from #HireNRC! Recruitment and Marketing Video

NUCLEPEDIA
Knowledge Resource of the USNRC

Dedicated Knowledge Management Team

Supporting Staff Development

Modernizing the Regulatory Infrastructure to Make the Safe Use of New Technologies Possible



Picture of first fuel assembly containing ATF rods loaded in United States. Photo Credit: Southern Nuclear/Plant Hatch

Photo Credit: Idaho National Labs

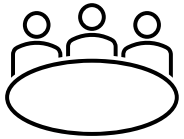
The Use of Risk Insights to Safely Resolve Technical Issues in a Timely Manner

FLEET ADOPTS RISK INFORMED PROGRAMS

- ✓ 100%: Risk-Informed Surveillance Frequency Control Program
- ✓ 54%: Risk-Informed Categorization of SSC
- ✓ 48%: Risk-Informed Completion Times

RISK IN INSPECTION ISSUES

Very Low Safety Significant Issue Resolution



CONTINUED EXTERNAL ENGAGEMENT

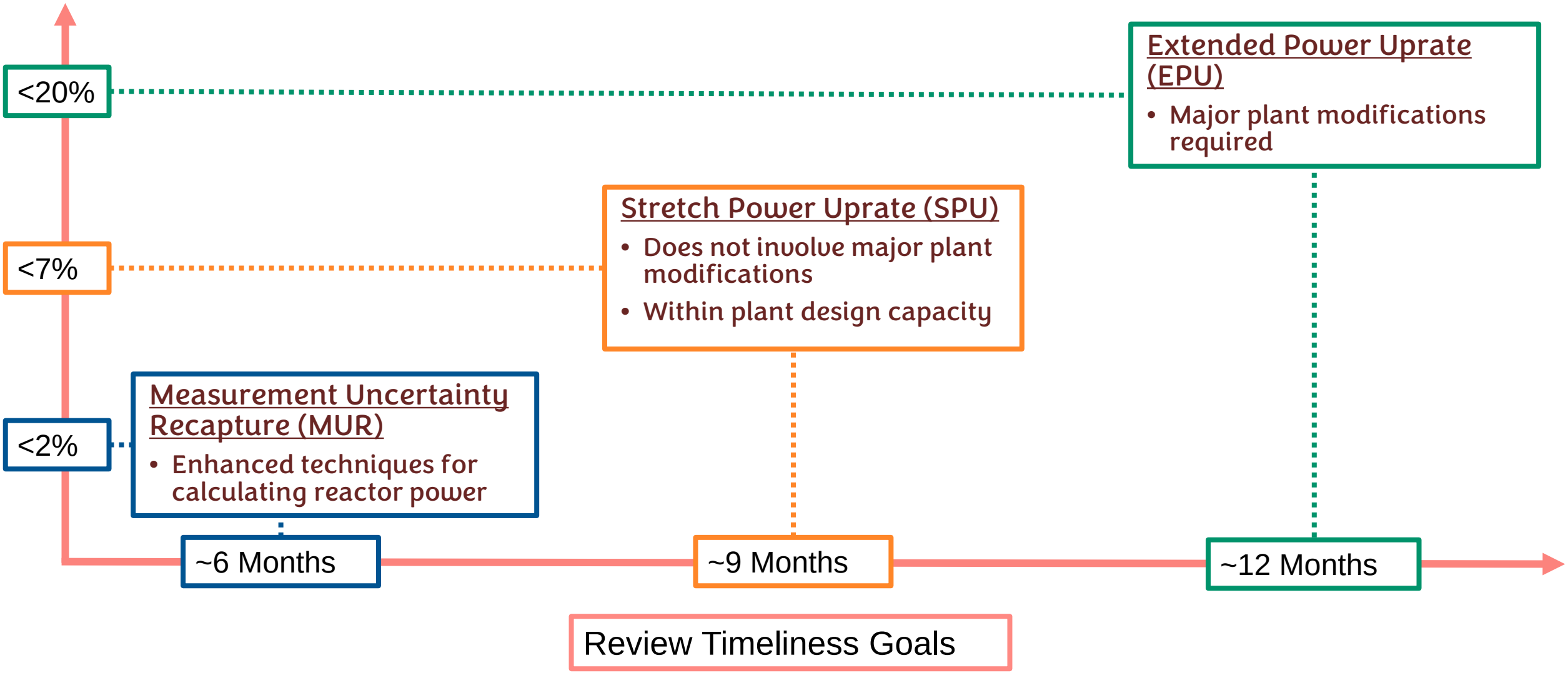
Recent Risk Forum with Industry and Public

Bill Orders

Senior Project Manager, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation

Readiness to License Power Uprates

Types of Power Uprates



Actively Monitoring the Landscape

- Inflation Reduction Act of 2022, tax credits supporting continued operations with power uprates and ATF.

- >50% of sites are planning for one or more power uprates with a combined capacity equivalent to 2 large LWRs.

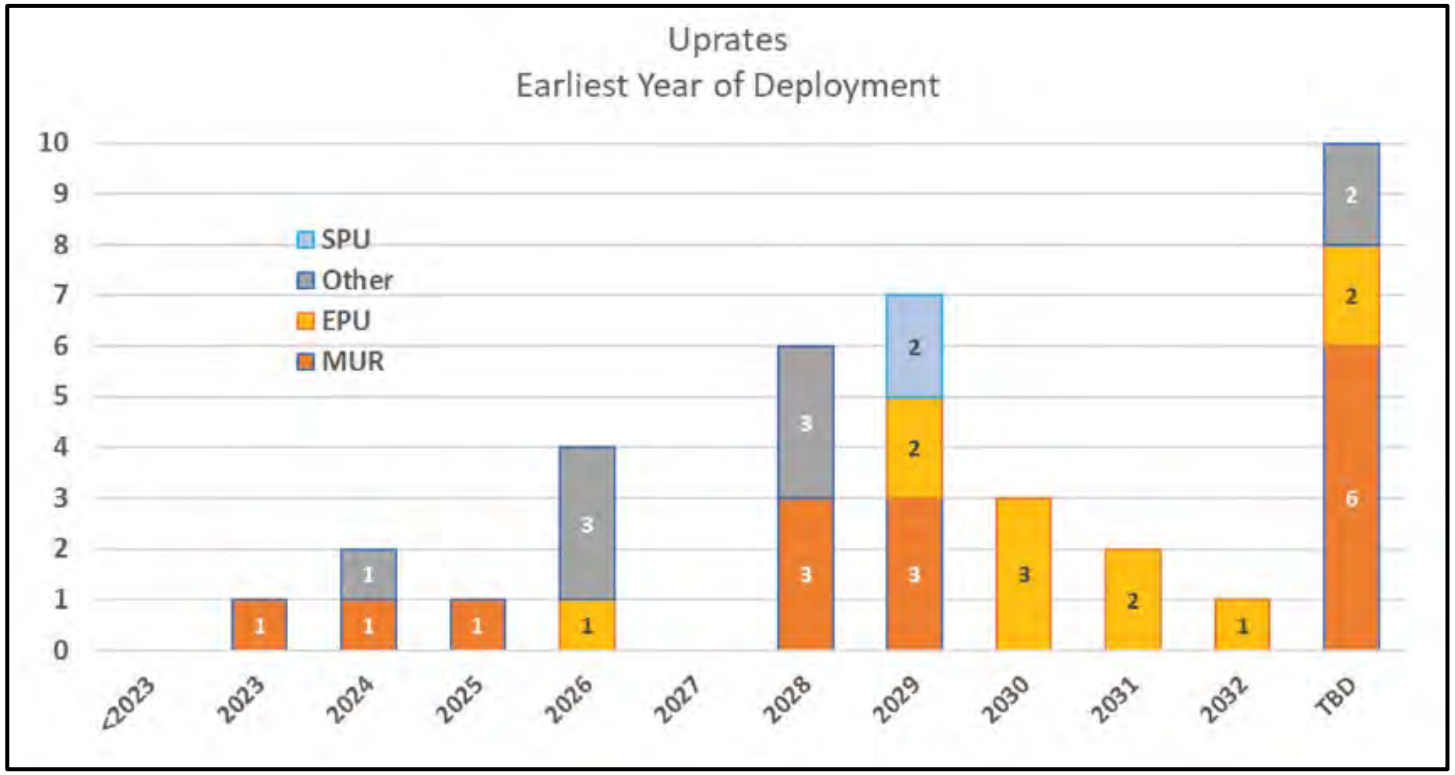
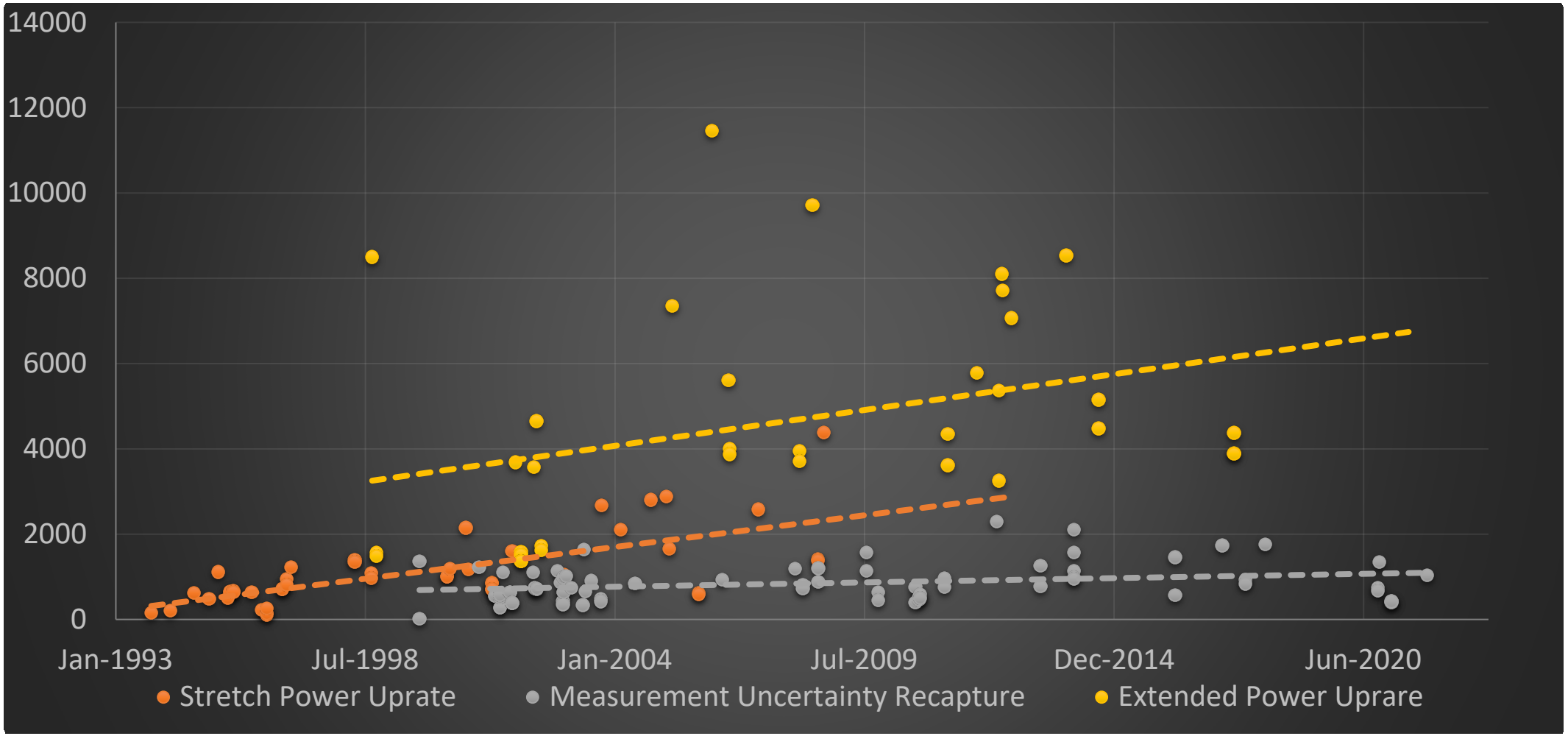


Photo Credit: Nuclear Energy Institute (NEI) The Future of Nuclear Power 2023 Baseline Survey
Note: Unspecified Power Uprates in the 1% to 3% range are identified as “Other” on this graphic.

Using Power Uprate Historical Data to Optimize our Future Processes

Level of Effort for Power Uprates

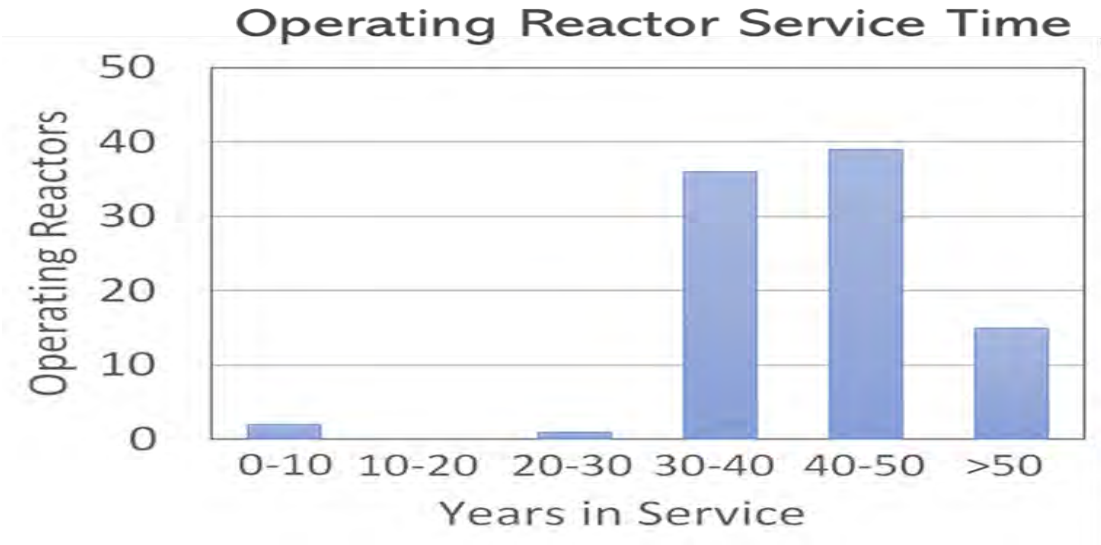


Brian Smith

Division Director, Division of New and Renewed Licenses, Office of Nuclear Reactor Regulation

License Renewal Program Update and Future Enhancement

License Renewal and Subsequent License Renewal Program Accomplishments/Updates



- Issued initial license renewals for 94 reactors and subsequent license renewals for 6 reactors.
- Issued the draft revised Generic Environmental Impact Statement and proposed rule.
- Updating subsequent license renewal guidance documents (GALL-SLR and SRP).
- Revised license renewal inspection procedures.
- Future submittals include an additional 4 applications within the next 6 months.

Domestic and International Outreach

- Domestic activities
  - Support from Office of Research
  - Coordination with EPRI and DOE
- International activities
  - Bilateral support
  - Multilateral workshop
  - IAEA's IGALL steering committee and support
  - Convention on Nuclear Safety – identified as good practice
  - International LTO conferences and seminars

2023 US NRC Workshop on Long Term Operation Reviews with Korea, Japan, India, France and Spain

License Renewal Enhancements

- Engaging with stakeholders to identify review efficiencies
  - Enhancing applications and process improvements
  - Evaluating use of risk information in aging management programs and reviews
- On-going process improvements for SLR Reviews
  - Reduction in staff hours while ensuring safety

Phil McKenna

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

Implementation of Reactor Oversight Process Enhancements

BASELINE INSPECTION PROGRAM

Minimum inspection for every operating reactor licensee

Provides reasonable assurance of adequate protection

BASELINE INSPECTIONS ARE RISK INFORMED

Selection of inspectable areas

Inspection frequency and sample size

Sample selection of activities and equipment

ROP IS CONSTANTLY EVOLVING

Operating experience

Internal and External Feedback

2019 ROP enhancement initiative

ROP is Inherently Risk Informed

ROP Enhancement has Improved Reactor Oversight

- **How we got here**
  - ROP enhancement has assisted shaping the risk informed ROP inspection program
- **ROP enhancements implemented in FY23**
  - Quadrennial engineering inspection cycle
  - Revised treatment of greater-than-green inspection findings and performance indicators
  - Revision to the problem and identification and resolution Inspection Procedure
- **Status of remaining actions**
  - Emergency Response Facility and Equipment Readiness Performance Indicator
  - Emergency Planning SDP

Beaver Valley Power Station (Units 1 and 2) in Shippingport, PA
Photo: First Energy

ROP BASELINE INSPECTION MONITORING PROGRAM

- ✓ Inspection dashboards and monitoring tools
- ✓ Data trending

ANNUAL ROP IMPLEMENTATION AUDIT

- ✓ Ensures regional consistency in ROP execution
- ✓ Recently revised so all Regions evaluate audit focus areas

INDUSTRY AND PUBLIC INPUT

- ✓ Industry fact of life changes
- ✓ Centralization of functions at licensee corporate level

INSPECTOR RESOURCES

- ✓ OpE Hub
- ✓ ROP Digital City

ROP SELF-ASSESSMENT

- ✓ Program area assessments
- ✓ Focused Assessments
- ✓ Effectiveness Reviews

Optimization of the Risk-Informed ROP Inspection Program

LaDonna Suggs

Acting Division Director, Division of Reactor Projects, Region II

Resident Inspector Health – Recruitment and Retention

Resident Inspectors are Integral to Safety

- Dedication to public safety
- 350+ plant events annually
  - ✓ Scrams
  - ✓ Emergency Declarations
  - ✓ Plant Startups
  - ✓ Weather Events
- Commitment to Excellence

McGuire Senior Resident Inspector, Chris Safouri, and Resident Inspector, Frank Young, inspecting an emergency diesel generator

Maintaining a Strong Resident Workforce

- **In the past two years:**
  - **Hired 38 New Staff in the Resident Inspector Development Program (RIDP)**
    - ✓ 40% of Regional Hiring
  - **23 RIDPs in permanent resident positions**

- **21 currently in the RIDP pool**

Innovations in Training to Maximize Efficiency

First two resident inspectors to complete an agency CBQ

Eleven RIDPs training with former senior residents at the Technical Training Center

Competency-Based Qualifications

- ✓ On the job training
- ✓ Individualized interactions with expert mentors
- ✓ Far less completion time

Enhanced Inspector Training

- ✓ Leverages former senior residents
- ✓ Also expedites qualification process while maintaining quality


Region II Counterpart Meeting

Strategic Solutions to Complex Challenges

Compensation and Hiring Flexibilities

- Forward-looking site coverage forecasting metrics
- Rehired annuitants
- Relocation Incentives

Retention and Career Development

- Annual and multi-tour financial incentives

Morale and Welfare

- Engagement with the Resident Inspector Standing Committee
- Streamlining agency systems and processes

Daniel Dorman

Executive Director for Operations

Concluding Remarks

Acronyms

ATF	Accident Tolerant Fuel
CBQ	Competency-Based Qualifications
CETI	Comprehensive Engineering Team Inspection
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EP SDP	Emergency Planning Significance Determination Process
EPU	Extended Power Uprate
GEIS	Generic Environmental Impact Statement
IAEA	International Atomic Energy Agency
IGALL	International Generic Aging Lessons Learned
LTO	Long Term Operation
NEI	Nuclear Energy Institute

NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
MUR	Measurement Uncertainty Recapture
OpE	Operational Experience
PI	Performance Indicator
PI&R	Problem Identification and Resolution
RIDP	Resident Inspector Development Program
ROP	Reactor Oversight Process
SLR	Subsequent License Renewal
SRP	Standard Review Plan
SPU	Stretch Power Uprate
VLSSIR	Very Low Safety Significance Issue Resolution Process

Daniel Dorman

Executive Director for Operations

Introduction

New Reactor Business Line

ROBERT TAYLOR

Strategic Priorities and Successes for the New Reactor Business Line

JONATHAN GREIVES

Effective and Timely Review for New and Advanced Reactors; Innovative Oversight Approaches for New and Advanced Reactors

JOHN MOSES

New and Advanced Reactor Environmental Review Transformation; Preparing the Agency for the Future of Environmental Reviews

DONNA WILLIAMS

International Collaboration on Regulating New and Advanced Reactors

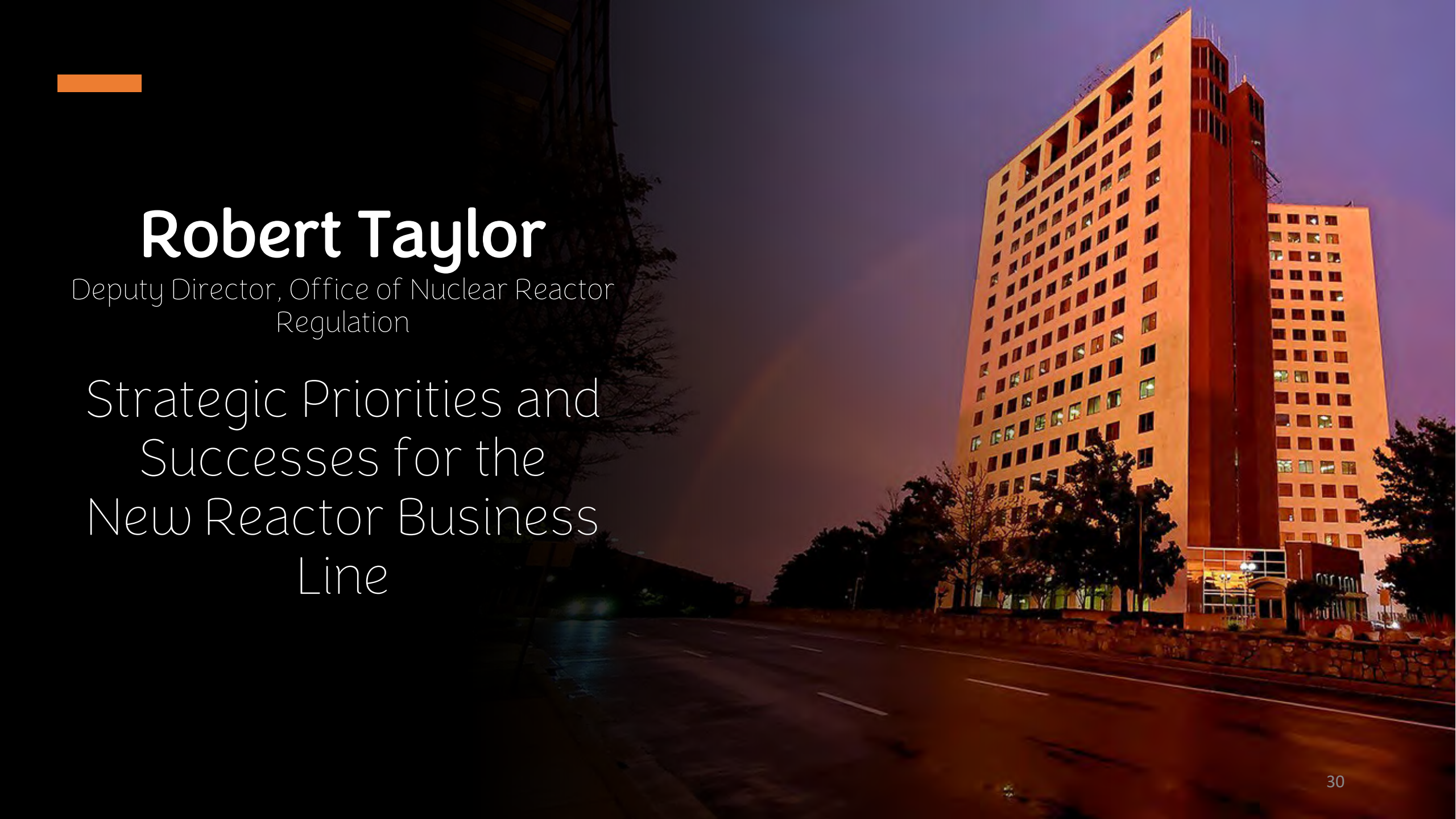
LAUREN NIST

Leveraging Successes and Lessons Learned from Vogtle 3&4 for Future Construction Projects

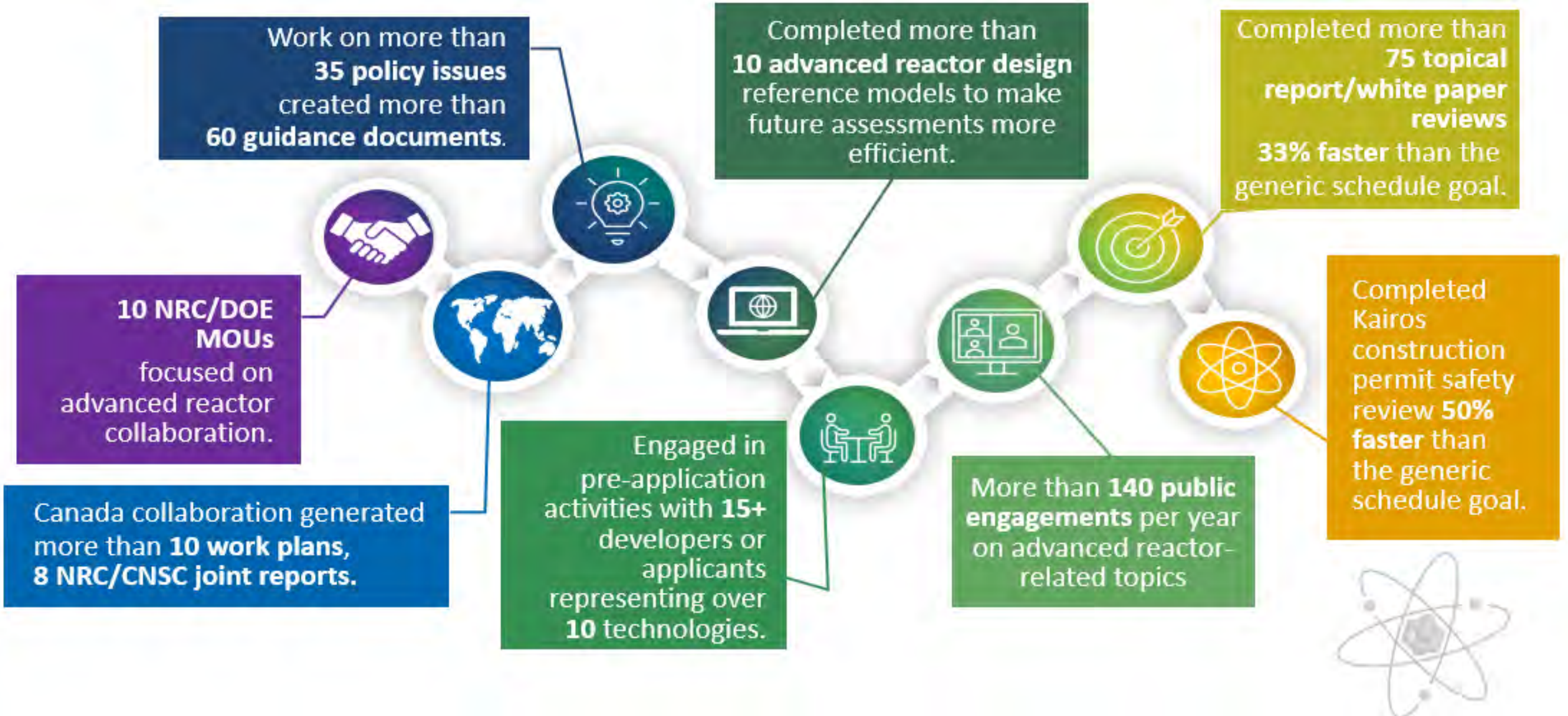
Robert Taylor

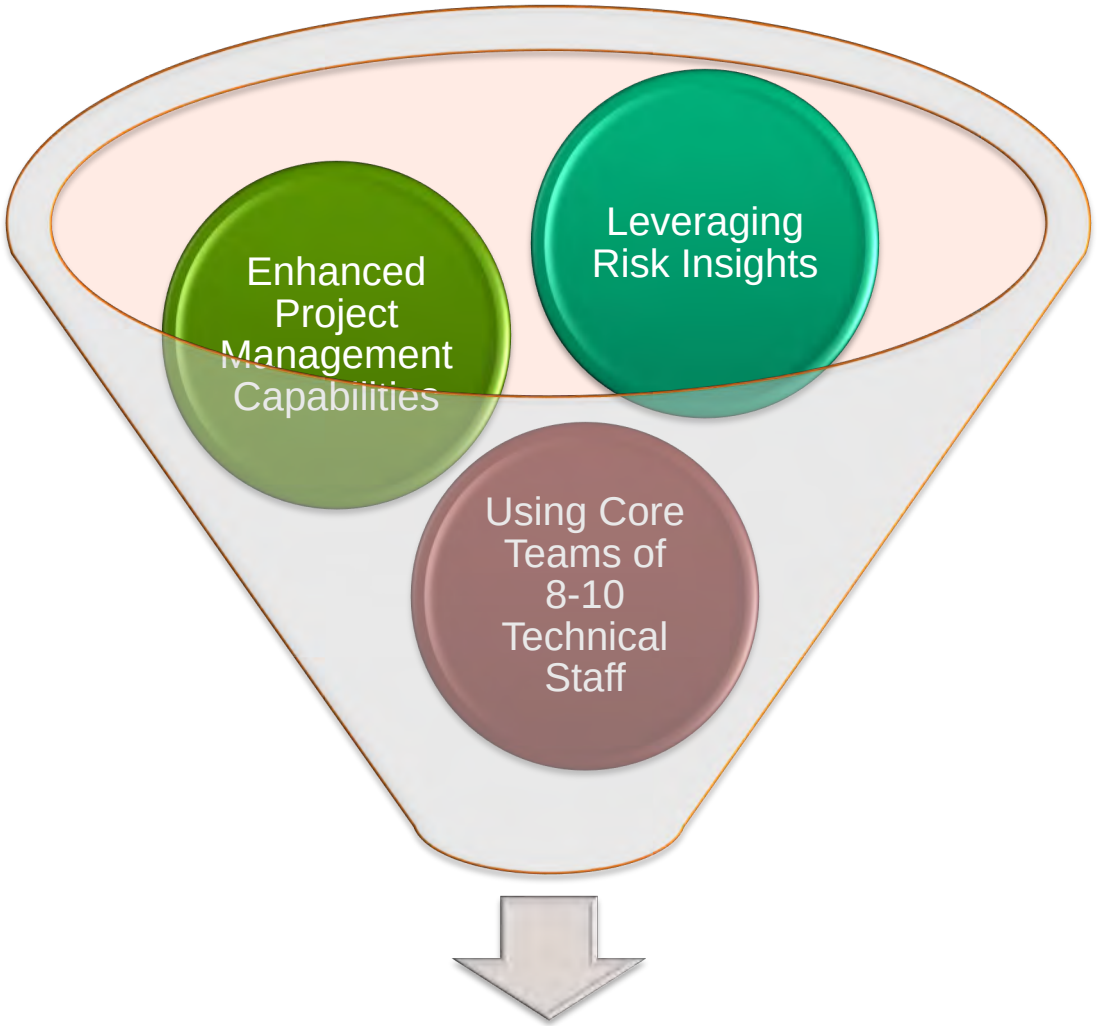
Deputy Director, Office of Nuclear Reactor Regulation

Strategic Priorities and Successes for the New Reactor Business Line



The NRC is Ready to License New and Advanced Reactors

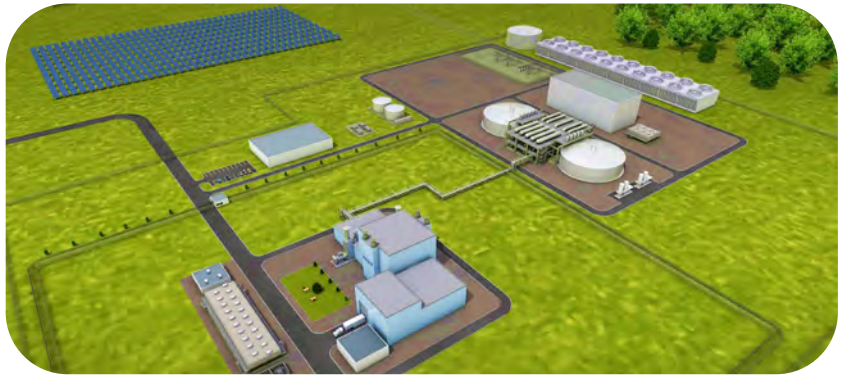




Timely and Cost-Effective Reviews without Compromising Safety

Looking Towards the Future and Committed to Make the Safe Use of Nuclear Technology Possible

The Naughton coal plant outside Kemmerer, Wyoming.
Photo: Caitlin Tan/Wyoming Public Media



TerraPower's Natrium Project – sited near the retiring Naughton coal plant

Preparing Staff to License Future Applications

Jonathan Greives

Acting Deputy Director, Division of Advanced Reactors and Non-Power Production and Utilization Facilities, Office of Nuclear Reactor Regulation

Effective and Timely Review and Innovative Oversight Approaches for New and Advanced Reactors

Pre-application Engagement

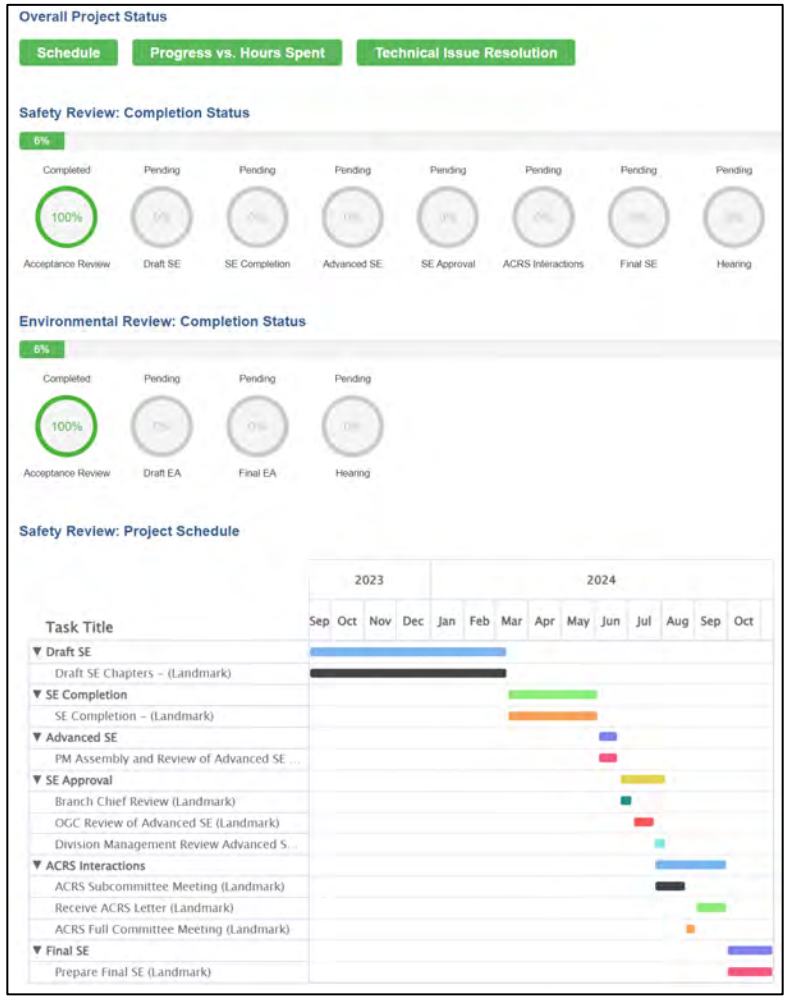
Application Readiness

NRC Readiness

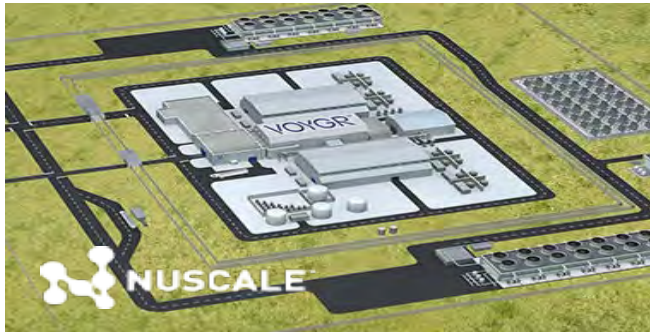
Execution is Built on a Foundation of Preparation

ADVANCED REACTOR READY

Staff Focused on Licensing Execution



Kairos Hermes 2 – External Dashboard



RISK-INFORMED

Uses facility risk insights to define the scope of inspection

PERFORMANCE BASED

Adjusts oversight based on performance of licensees and manufacturers

TECHNOLOGY INCLUSIVE

Covers the full spectrum of advanced technologies being considered

SCALABLE

Uses a graded approach to inspection efforts commensurate with a facility's public health and safety risk

INFORMED BY EXPERIENCE

Applies experience and leverages lessons from past and current NRC inspection programs

COMPREHENSIVE

Provides for oversight of all activities that are significant to construction quality

INNOVATIVE

Leverages new inspection tools and approaches to enhance efficiency and effectiveness

Advanced Reactor Construction Oversight Program – Vision

SECY-23-0048

Advanced Reactor Construction Oversight Process – Next Steps

IMC DRAFT COMPLETION

New inspection manual chapters are being developed for ARCOP

INTERNAL TABLETOPS

Evaluate ARCOP processes with data and experience

EXTERNAL WORKSHOPS

Engage stakeholders

INTERNATIONAL COOPERATION

Continue cooperation

INSPECTION TECHNOLOGY

Expand use of new technologies

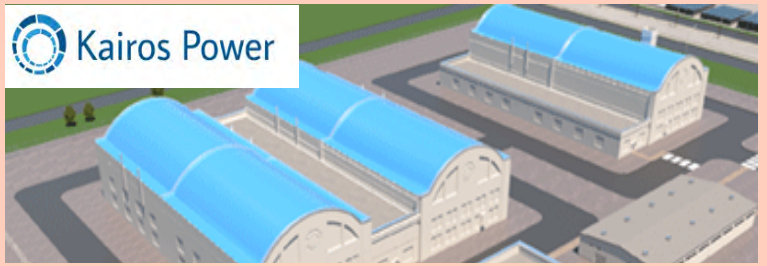
John Moses

Deputy Director, Division of Rulemaking Environmental and Financial Services, Office of Nuclear Materials Safety and Security

Preparing for the Future of Environmental Review

Adapting to NEPA Changes and Streamlining Environmental Review

Photo credit: Robert Schwemmer/NOAA



Fiscal Responsibility Act NEPA Amendments

- Time Limits
- Page Limits
- Agency interaction

Process Improvements

- Portfolio Approach
- Agile Project Management
- Example: Hermes 2 EA

Realignment: A More Nimble Organization to Handle Increasing Workload

Clinch River Early Site Permit Site Audit Review Team – Comprised of NRC, Contract Support, and Army Corps of Engineers Staff

Carbon Free Power Project Review Team – Comprised of NRC Staff and Contractor Support


Northern Chumash; Photo credit: Robert Schwemmer/NOAA

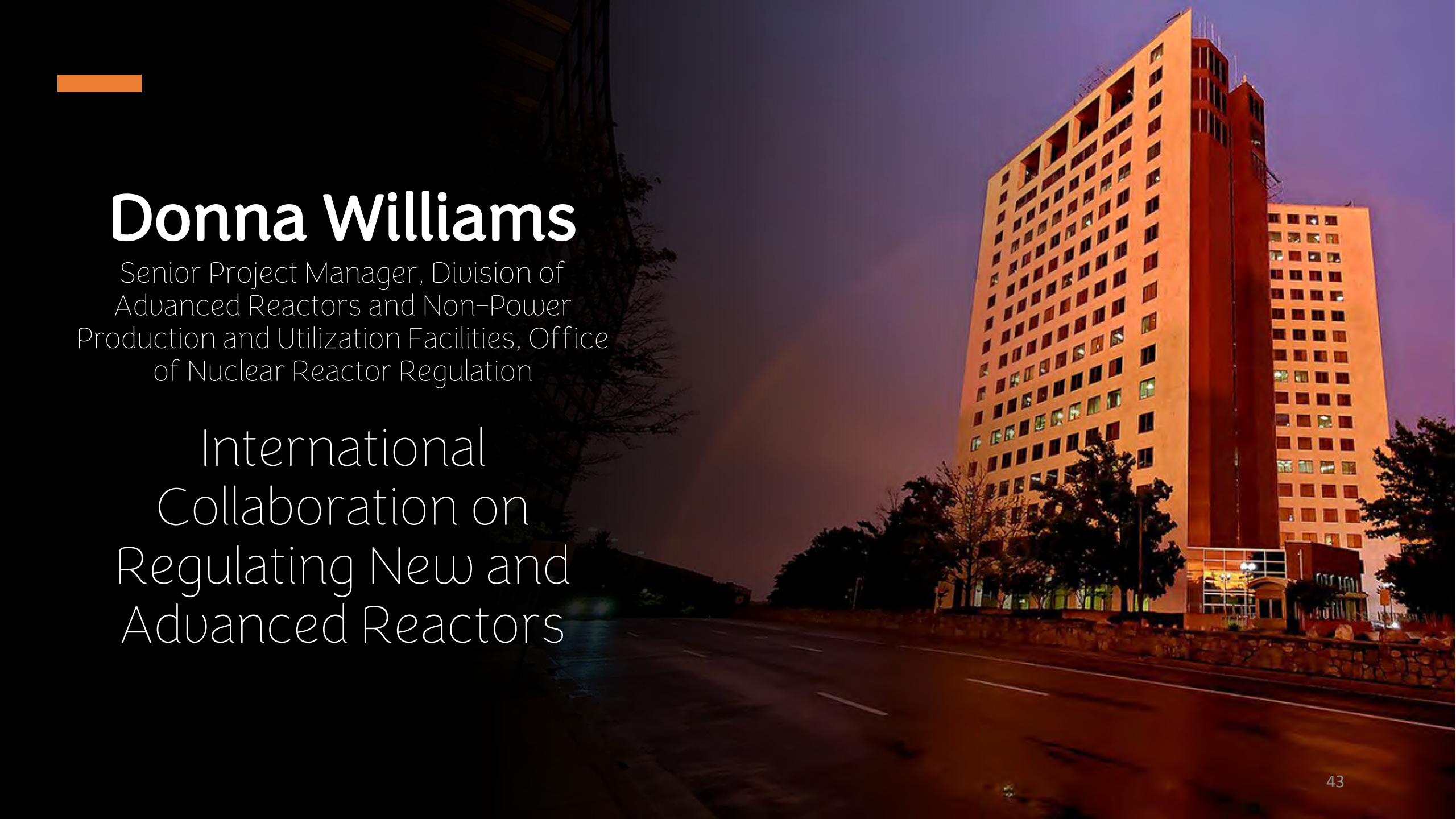
Robust Tribal engagement

Enhanced agency interaction


Triso-X Local and State Official Lunch and Learn
Photo credit: WYSH radio

New communication channels

Improved Stakeholder Confidence Through Meaningful Engagement and Communication



Donna Williams

Senior Project Manager, Division of Advanced Reactors and Non-Power Production and Utilization Facilities, Office of Nuclear Reactor Regulation

International Collaboration on Regulating New and Advanced Reactors

IAEA

SMALL MODULAR REACTOR REGULATORS FORUM

NEA Nuclear Energy Agency

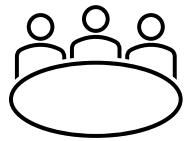
WORKING GROUP ON NEW TECHNOLOGIES

NEA Nuclear Energy Agency

WORKING GROUP ON POLICY AND LICENSING

IAEA

NUCLEAR HARMONIZATION AND STANDARDIZATION INITIATIVE



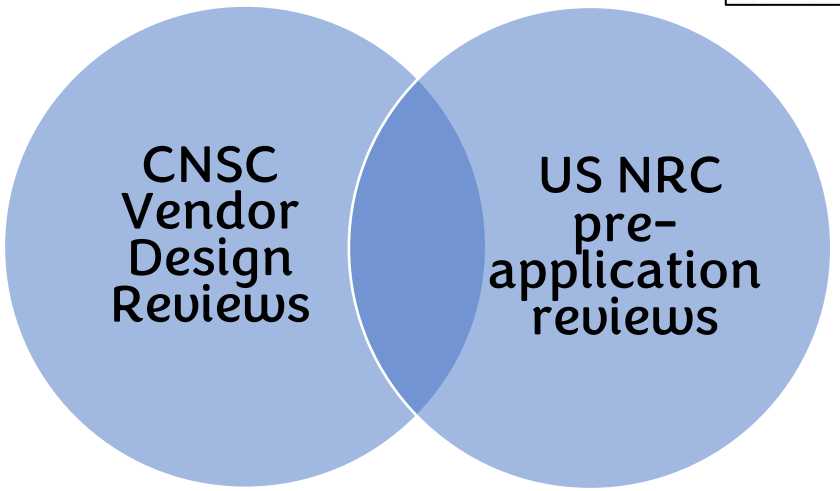
BILATERAL SUPPORT TO EMBARKING COUNTRIES

Active Engagement With International Communities on Advanced Reactors and Small Modular Reactors

Collaboration with the Canadian Nuclear Safety Commission to Address Challenging Topics in Licensing Advanced Reactors

8 joint reports issued

Collaboration on GEH BWRX-300



Lauren Nist

Acting Director, Vogtle Project Office,
Office of Nuclear Reactor Regulation

Leveraging Successes and Lessons Learned from Vogtle 3 and 4 for Future Construction Projects

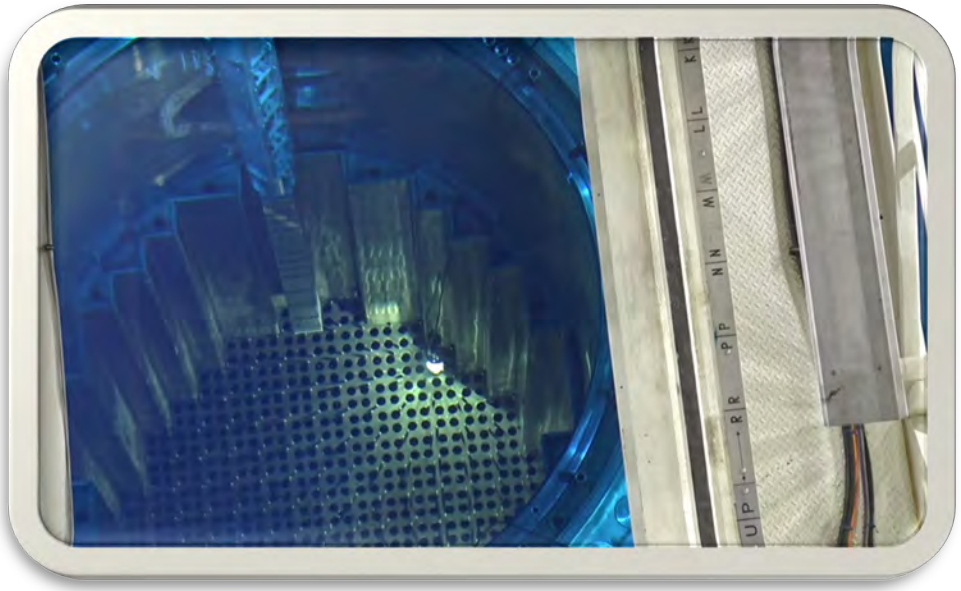
NRC Accomplishments at Vogtle 3 and 4

The NRC staff completed inspections of startup tests on Vogtle Unit 3, which commenced commercial operation on July 31, 2023.

NRR issued emergent and exigent license amendments for Vogtle Unit 3 allowing for the licensee to safely conduct repairs and avoid delays in startup testing.

NRR issued the 10 CFR 52.103(g) finding for Vogtle Unit 4 on July 28, 2023.

Plant Vogtle (4 nuclear units) in Waynesboro, Georgia.
Photo: Southern Nuclear Company



Plant Vogtle Unit 4 fuel load in Waynesboro, Georgia.
Photo: Southern Nuclear Company

The staff is assessing lessons learned from Vogtle units 3 and 4 for future construction projects.

Leveraging Lessons Learned and Preparing for Transitions

Daniel Dorman

Executive Director for Operations

Concluding Remarks

Acronyms

ARCOP	Advanced Reactor Construction Oversight Program
CFR	Code of Federal Regulations
CNSC	Canadian Nuclear Safety Commission
CP	Construction Permit
cROP	Construction Reactor Oversight Process
DOE	U.S. Department of Energy
EA	Environmental Assessment
ECOE	Environmental Center of Expertise
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impacts
GEH	GE Hitachi
IAEA	International Atomic Energy Agency

NEA	Nuclear Energy Agency
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
MOU	Memoranda of Understanding
OPG	Ontario Power Generation
ROP	Reactor Oversight Process
RAI	Request for Additional Information
SNC	Southern Nuclear Company
TVA	Tennessee Valley Authority
VRG	Vogtle Readiness Group