SCHEDULING NOTE

Title: **STRATEGIC PROGRAMMATIC OVERVIEW OF THE NEW REACTORS BUSINESS LINE (Public Meeting)**

Purpose: The purpose of the briefing is to provide the Commission with a discussion of strategic considerations associated with the New Reactors Business Line.

Scheduled: **January 25, 2018**
10:00 a.m.

Duration: 2 hours

Location: Commissioners' Conference Room, 1st Floor OWFN

Participants: **Presentation**

NRC Staff **60 mins.***

Michael Johnson, Deputy Executive Director for Reactor and Preparedness Programs
Vonna L. Ordaz, Deputy Director, Office of New Reactors
Bill Jones, Director, Division of Construction, Region II
Frank Akstulewicz, Director Division of New Reactor Licensing
John Monninger, Director, Division of Safety Systems, Risk Assessment, and Advanced Reactors
Timothy McGinty, Director, Division of Construction Inspection and Operational Programs

Topics:

- Large Light Water and Small Modular Reactor Licensing
  - Current and near-term licensing activities
  - Small modular reactor (SMR) activities (e.g., emergency preparedness for SMR rulemaking, NuScale design certification review)
- Advanced Reactor Licensing
  - Path to readiness to review and license advanced reactor designs
- Construction Oversight and Licensing Workload
  - Goals, challenges, and strategies to adapt to changes in workload

- Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)
  - Current status of ITAAC review
  - Efforts to confirm that NRC is prepared for a potential surge in ITAAC
- Vendor Inspections
  - Results and challenges

Commission Q & A **50 mins.**

Discussion – Wrap-Up **5 mins.**

*For presentation only and does not include time for Commission Q & A's

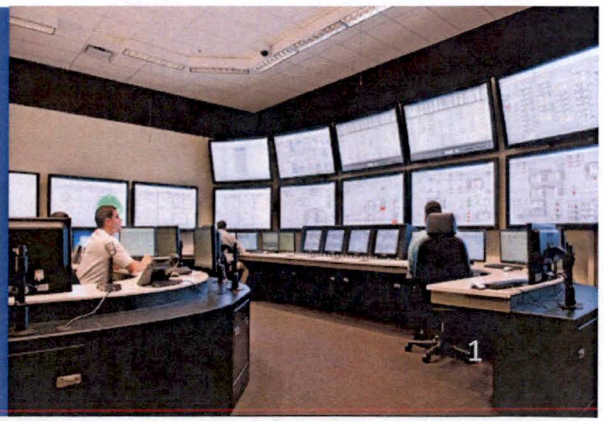
U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Strategic Programmatic Overview of the New Reactors Business Line

January 25, 2018



Agenda

- Overview of the New Reactor Program – Vonna Ordaz
- Large Light Water and Small Modular Reactor Licensing – Frank Akstulewicz
- Advanced Reactor Licensing – John Monninger
- Construction Inspection Program –Tim McGinty and Bill Jones

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Overview of the New Reactor Program

Vonna Ordaz
Deputy Director
Office of New Reactors

Continued Focus on our Core Mission

- Executing efficiently with the support of our agency partner offices
- Making measurable progress
- Actively engaging with the new reactor industry and other external stakeholders in a transparent manner

Instilling Innovative Approaches to Enhance Our Outcomes

- Revised review approaches and more stringent metrics
- Enhancements to processes
- Early resolution of key issues and timely decision making
- Enhanced outreach

Proactively Planning for the Future

- Demonstrating agility in addressing industry changes
- Executing the vision for advanced reactor licensing
- Preparing for the transition to operations for new units
- Positioning the office for future organizational changes

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Large Light Water and Small Modular Reactor Licensing

Frank Akstulewicz, Director

Division of New Reactor Licensing

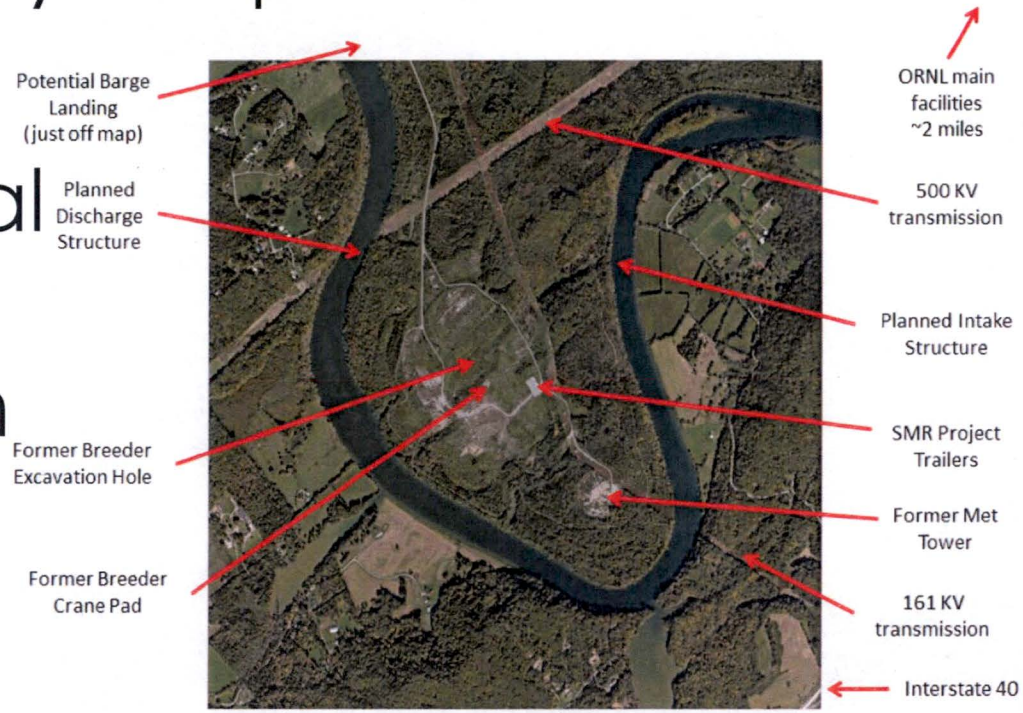
Making Measurable Progress (1/3)

- Completed 56 licensing actions
  - 32 for Vogtle
  - 24 for V.C. Summer
- Completed mandatory hearing for the Turkey Point combined license application
- Issued the North Anna combined license

North Anna COL Signing Ceremony

Making Measurable Progress (2/3)

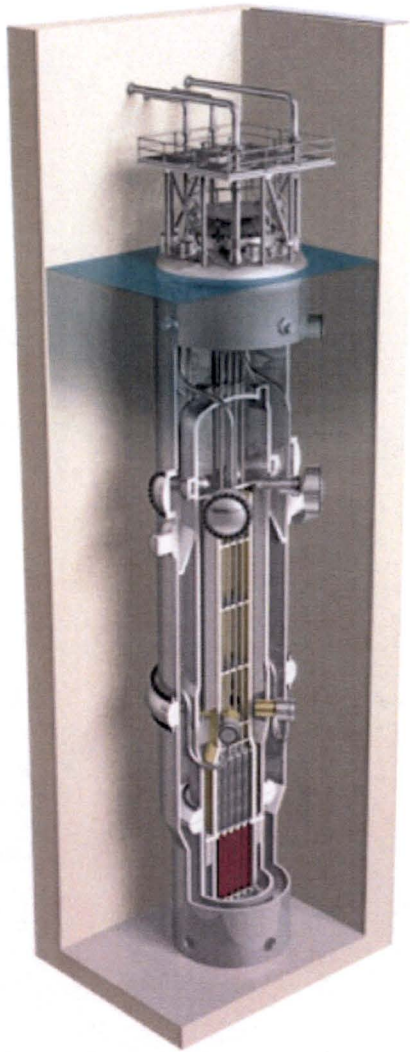
- Achieving review milestones for the Clinch River early site permit application
- Completing final phases of APR1400 design certification application



TVA ESP Site – Points of Interest
Photo courtesy of TVA

Making Measurable Progress (3/3)

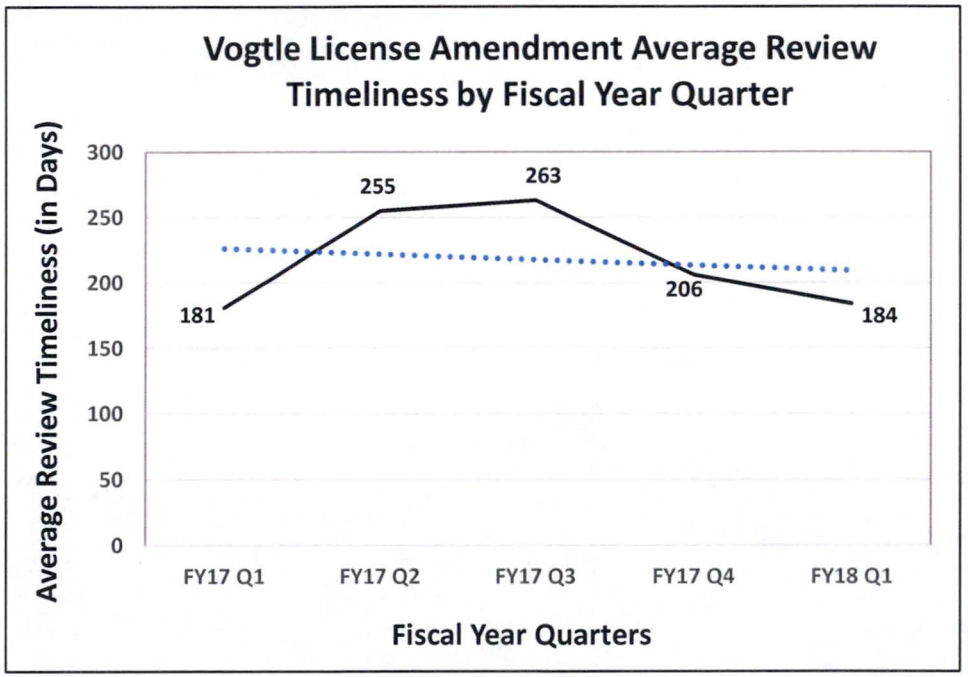
- Proactively engaging at all levels
- Resolving technical and regulatory issues on NuScale small modular reactor design certification application



Cross-sectional view of NuScale SMR
Photo courtesy of NuScale Power, LLC

Increasing Effectiveness and Efficiency

- Licensing activities readiness meetings with Southern Nuclear Company
- License amendment metrics
- Revised review processes
  - Enhanced use of audits
  - RAI quality
  - Enhanced safety focused review



Preparing for Licensing Work in FY 2018 and Beyond

- No new light water reactor design certification, combined license, or early site permit applicants expected in the near term
- Continuing licensing support of Vogtle construction
- Completing current applications
- Preparing for future operating license and combined license applications

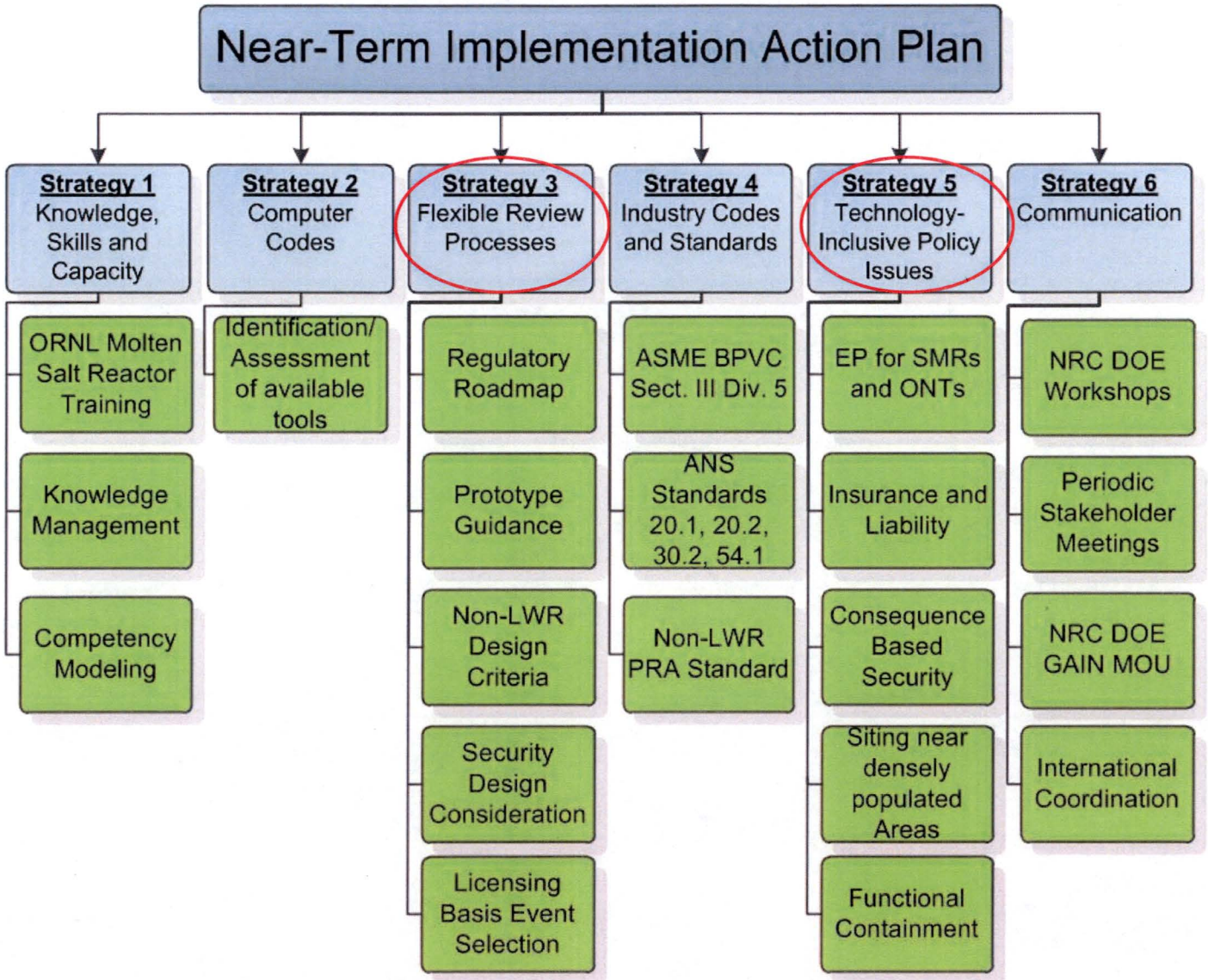
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Advanced Reactor Licensing

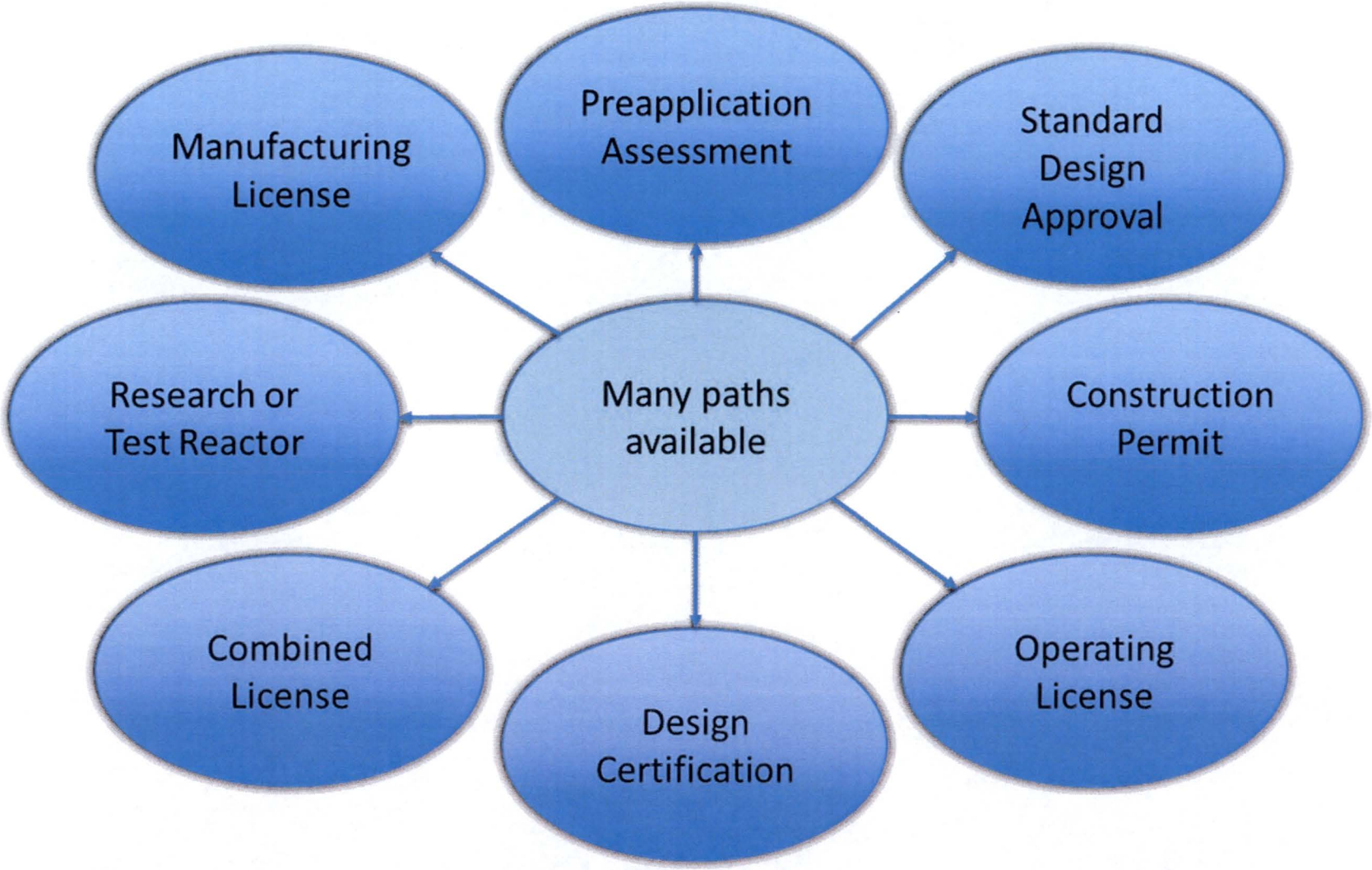
John Monninger
Director, Division of Safety Systems, Risk Assessment, and Advanced Reactors

Executing the Vision and Strategy

Making Progress in the Near-Term



Clarifying Flexible Review Processes



Resolving Key Issues Early

- Non-light water reactor design criteria
- Risk-informed and performance-based licensing basis event selection
- Functional containment performance
- Consequence based security

Evolving Landscape

- Preparing for anticipated applications in the next 2 to 4 years
- Three major technology groups: high temperature gas reactors, liquid metal fast reactors, and molten salt reactors
- Dynamic budget environment

Supporting Early Preapplication Interactions

Developer	Design	Power	Technology
Oklo Inc.	Oklo	~7 MWt	Compact Fast Reactor
Transatomic Power	Transatomic	Small scale	Molten Salt Reactor
Terrestrial Energy	Integral Molten Salt Reactor (IMSR)	400 MWt	Molten Salt Reactor
X-Energy	Xe-100	200 MWt	Modular High Temperature Gas-Cooled Reactor (Pebble Bed)
Terrapower	Molten Chloride Fast Reactor (MCFR)	~2000 MWt	Molten Salt Reactor

Robust Stakeholder Engagement

- Successful outreach
- Periodic stakeholder meetings
- Coordination with Department of Energy
- International cooperation

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Construction Inspection Program

Tim McGinty, Director
Division of Construction Inspection
and Operational Programs

Focusing on Construction Inspection

- Schedule and resources
- Timely decision making
- Early resolution of policy issues
- External stakeholder feedback

Increasing Effectiveness and Efficiency of the Operator Licensing Program

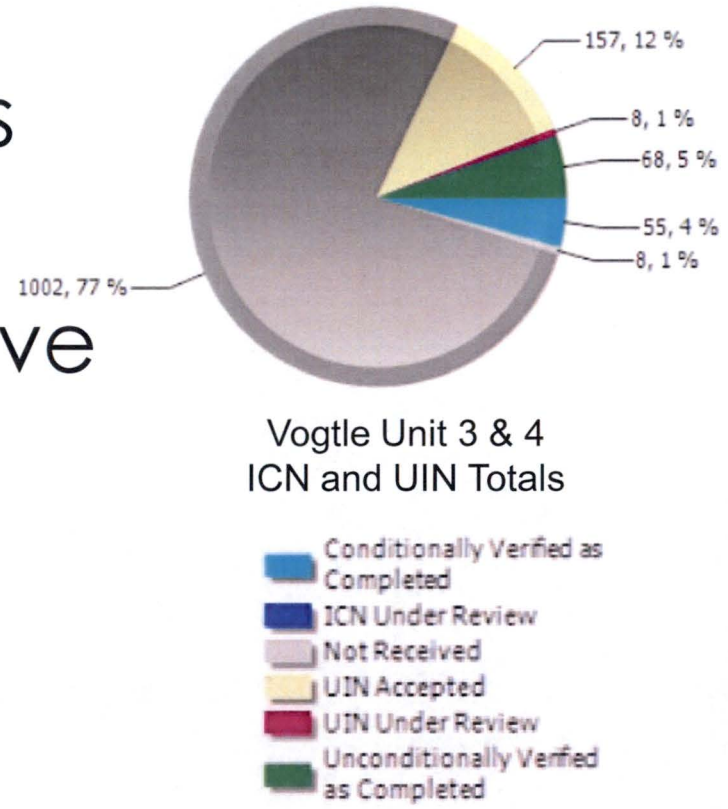
- Cold Licensing Charters underway
- Collaboration with NRR & Region II
- Enhancements will benefit current and future licensees

AP1000 Control Room Simulator

NuScale Control Room Simulator

Enhancing Effectiveness of the ITAAC Closure Program

- ITAAC Closure Notification (ICN) Status
- Uncompleted ITAAC Notification (UIN) initiative
- ITAAC Consolidation
- Streamlined feedback process in public meetings



Increasing the Efficiency of the ITAAC Closure Program

- ITAAC Demonstration Project
- Cross qualification
- Complex ITAAC tabletop

Measuring NRC's ITAAC Notification Performance

- Established ITAAC dashboard
- Early Identification of issues
- Enhancements to the public website

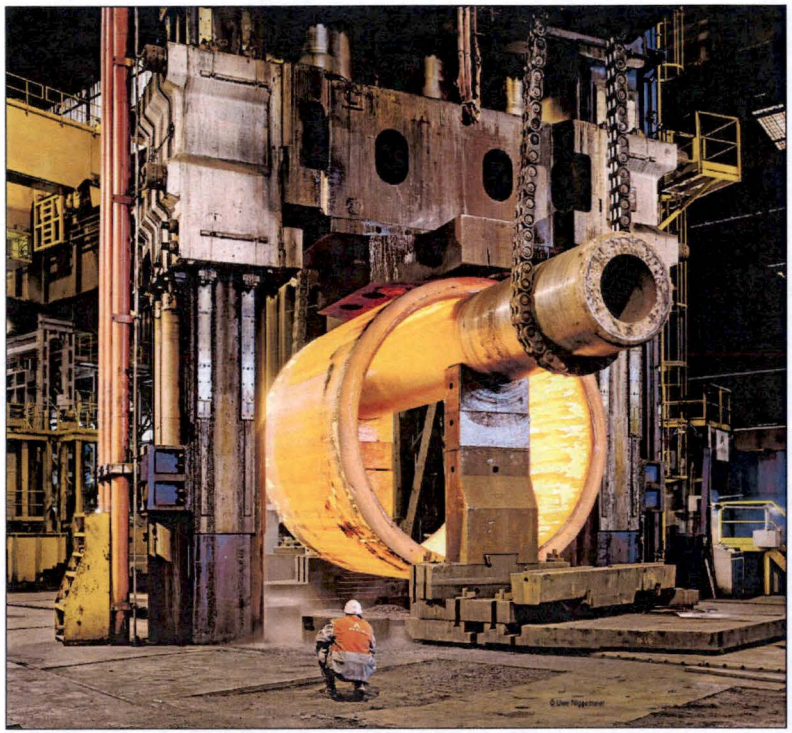
Preparing for the Next Phases of Construction

- Transition to Operations Implementation Plan
- Merger considerations
- 10 CFR 52.103(g) implementing procedures

Vogtle construction site

Maintaining Effective Oversight of the Nuclear Supply Chain

- AP1000 components
- ITAAC closures
- Center of expertise
- Operating and new reactors



Fabrication at Creusot Forge

Adapting to Reduction in New Reactor Fabrication and Construction Activities

Construction ceased at V.C. Summer Units 2 and 3

- Vendor inspection metrics adjusted
- Staffing levels reduced
- Vendor Inspection branches restructured

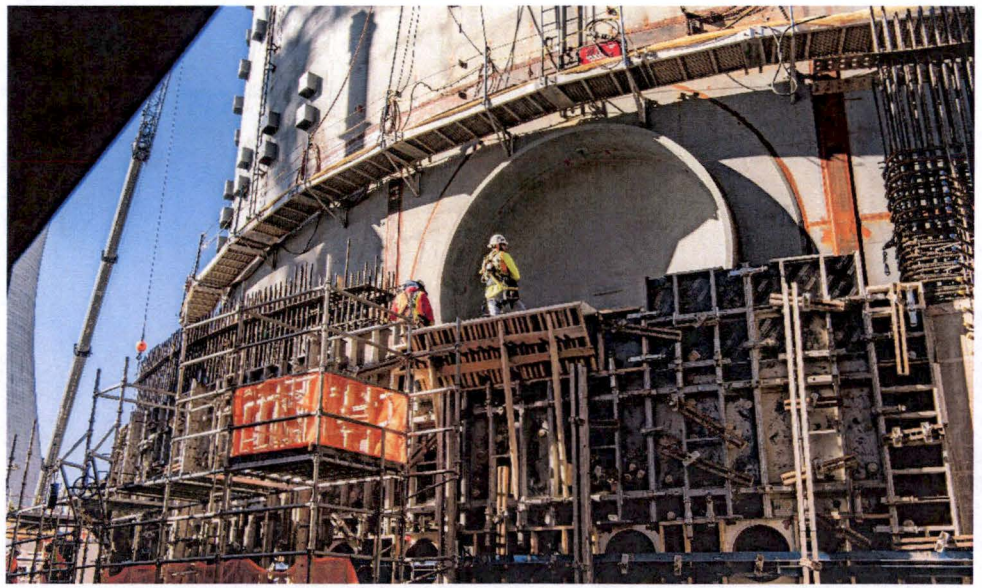
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Construction Inspection Program

William Jones, Director
Division of Construction Oversight
Region II

Aligning Construction Inspection Resources with Construction Activities

- Inspection staffing aligned to construction schedule
- Organizational changes facilitate inspections through operations



Vogtle Unit 3 shield building

Effectively Meeting the Challenges of a Dynamic Construction Environment

- Construction status
- ITAAC and operational programs inspection status
- Coordination with NRO, NSIR, and NRR

1.4 million-pound steam generator lifted into Unit 3 containment

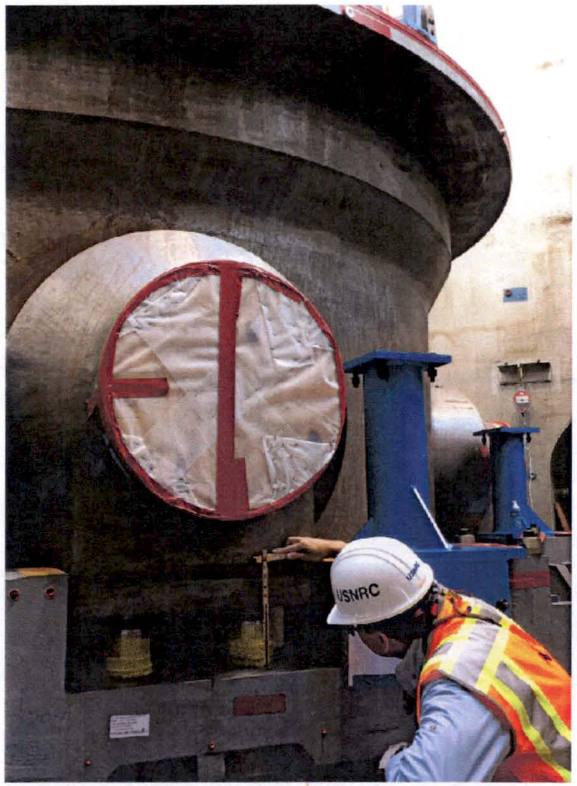
Piloting New and Revised Inspection Metrics

- Inspection scheduling
- ITAAC findings
- Technical resolution issues
- ITAAC screening issues
- Inspection report input

Inspector performing
ITAAC inspection activities

Ensuring Effective Inspection Planning and Scheduling

- ITAAC inspections
- Digital instrumentation and controls
- Initial test program inspection process
- Piping design acceptance criteria program



Inspector in the field with Unit 3 reactor vessel

Leveraging International Interactions

- Inspector exchange
- Anticipated test observations
- Future inspector exchange opportunities
- Executive NRC visit to China – Fall 2017

Acronyms

- ITAAC Inspections, Tests, Analysis, and Acceptance Criteria
- RAI Request for additional information
- ORNL Oak Ridge National Laboratory
- LWR Light water reactor
- ASME BPVC American Society of Mechanical Engineers Boiler and Pressure Vessel Code

Acronyms

- ANS American Nuclear Society
- EP Emergency Preparedness
- PRA Probabilistic Risk Assessment
- GAIN Gateway for Accelerated Innovation in Nuclear
- NRR Office of Nuclear Reactor Regulation
- NSIR Office of Nuclear Security and Incident Response