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New Reactor Licensing
Challenges and Lessons Learned

Presentation
for
the Nuclear Power Plant Leadership Meeting
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Division of New Reactor Licensing
Office of New Reactors
Frank Akstulewicz, Deputy Director for Licensing Operations

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US Nuclear Regulatory Commission (NRC) Mission

NRC's primary mission is to protect the public health and safety, and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. We also regulate these nuclear materials and facilities to promote the common defense and security.

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NRC Regulates:

- 104 commercial nuclear power plants that provide about 20 percent of the nation's electricity
- 45 fuel facilities involved in the extraction, processing, and fabrication of uranium into reactor fuel
- Approximately 4,000 large and small users of nuclear material for industrial, medical, or academic purposes
- Low-level and high-level waste facilities, interim storage of spent nuclear fuel, containers used in the transportation of radioactive fuel, and decommissioning of nuclear facilities

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Office of New Reactors (NRO) Mission

NRO serves the public interest by enabling the safe, secure, and environmentally responsible use of nuclear power in meeting the nation's future energy needs.

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Part 52 Licensing Processes

- Licensing Processes:
  - Early Site Permit (ESP)
  - Design Certification (DC)
  - Combined License (COL)
- Provide a predictable licensing process
- Resolve safety and environmental issues before authorizing construction
- Provide for timely & meaningful public participation
- Encourage standardization of nuclear plant designs
- Provide regulatory stability to nuclear plant licensees

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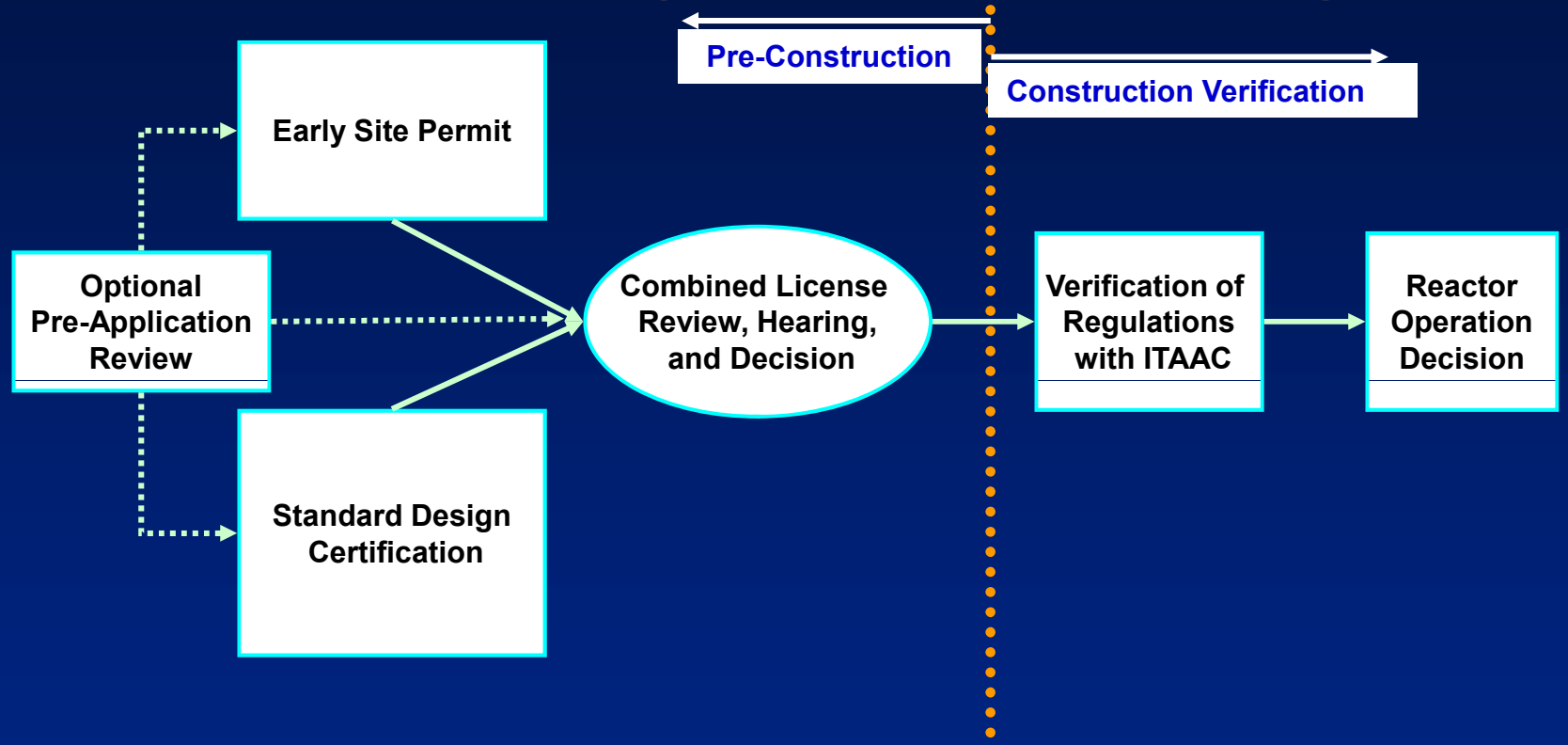
Part 52 - Fitting the Pieces Together



- Licensing decisions finalized before major construction begins
- Inspections w/ITAAC (Inspections, Tests, Analyses, and Acceptance Criteria) to verify construction
- Limited work may be authorized before COL issuance

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Early Site Permits

- Allows Early Resolution of Siting Issues and “Banking” of a Site for 10 – 20 Years

- Review Areas Include:
  - Site safety
  - Environmental impact
  - Emergency preparedness

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Design Certifications

- Essentially complete design
- Final design information
- Interface requirements
- Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)
- Reduces licensing uncertainty by resolving design issues
- Higher degree of regulatory finality with design certification

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Combined License Applications

- Combined construction permit and operating license for a nuclear power plant
- May reference an early site permit, a standard design certification, both, or neither
- Objective is to resolve all safety & environmental issues before authorizing construction
- Prior to fuel load, must verify the facility has been constructed in accordance with the license
- The combined license process in Part 52 is fundamental for providing regulatory stability for companies building nuclear power plants

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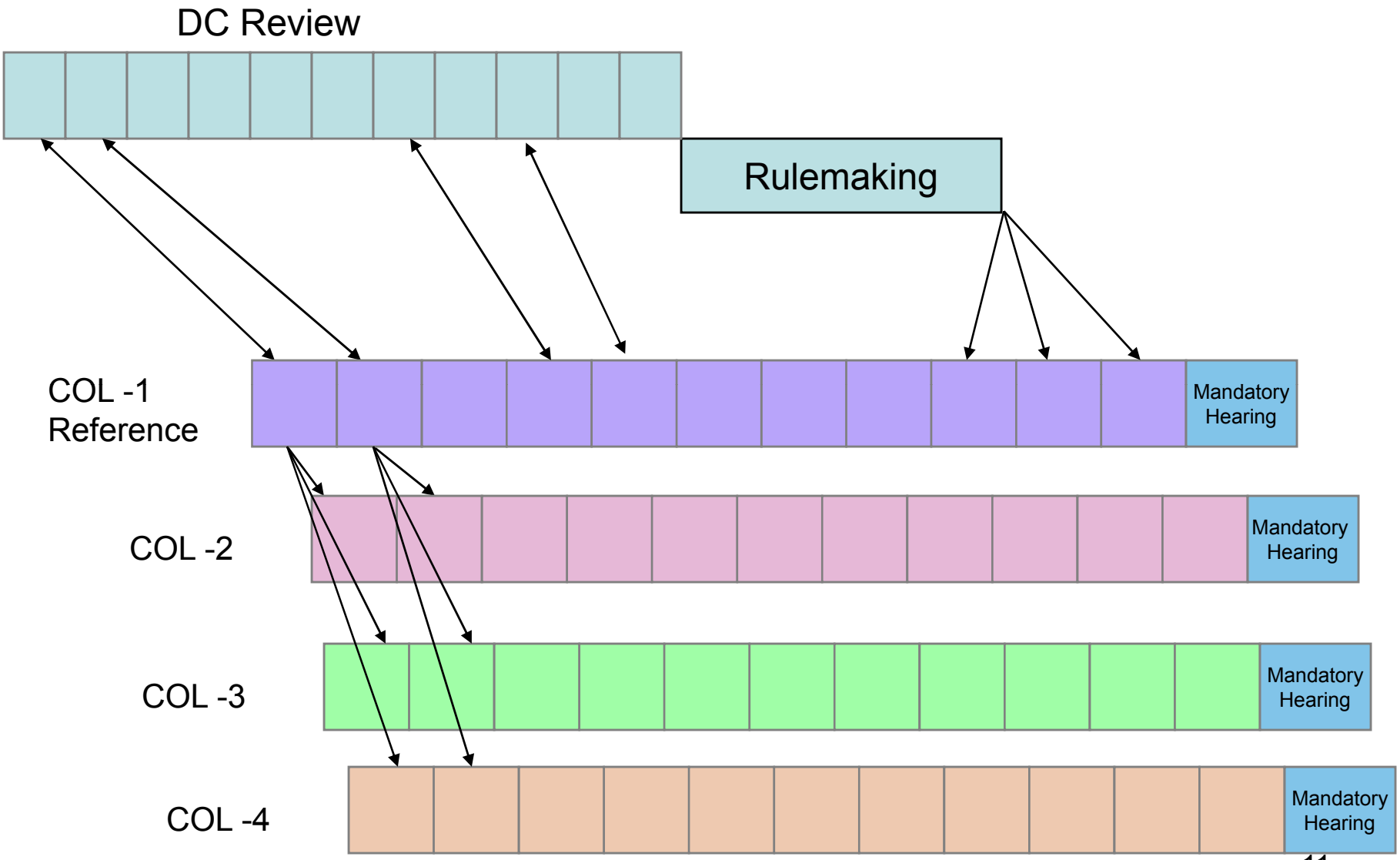
New Reactor Licensing

- 37 new plants at 24 sites proposed by the industry
- Five different plant designs proposed
  - AP1000
  - Economic Simplified Boiling Water Reactor
  - Evolutionary Power Reactor
  - Advanced Boiling Water Reactor
  - Advanced Pressurized Water Reactor

One Decision – Multiple Applications



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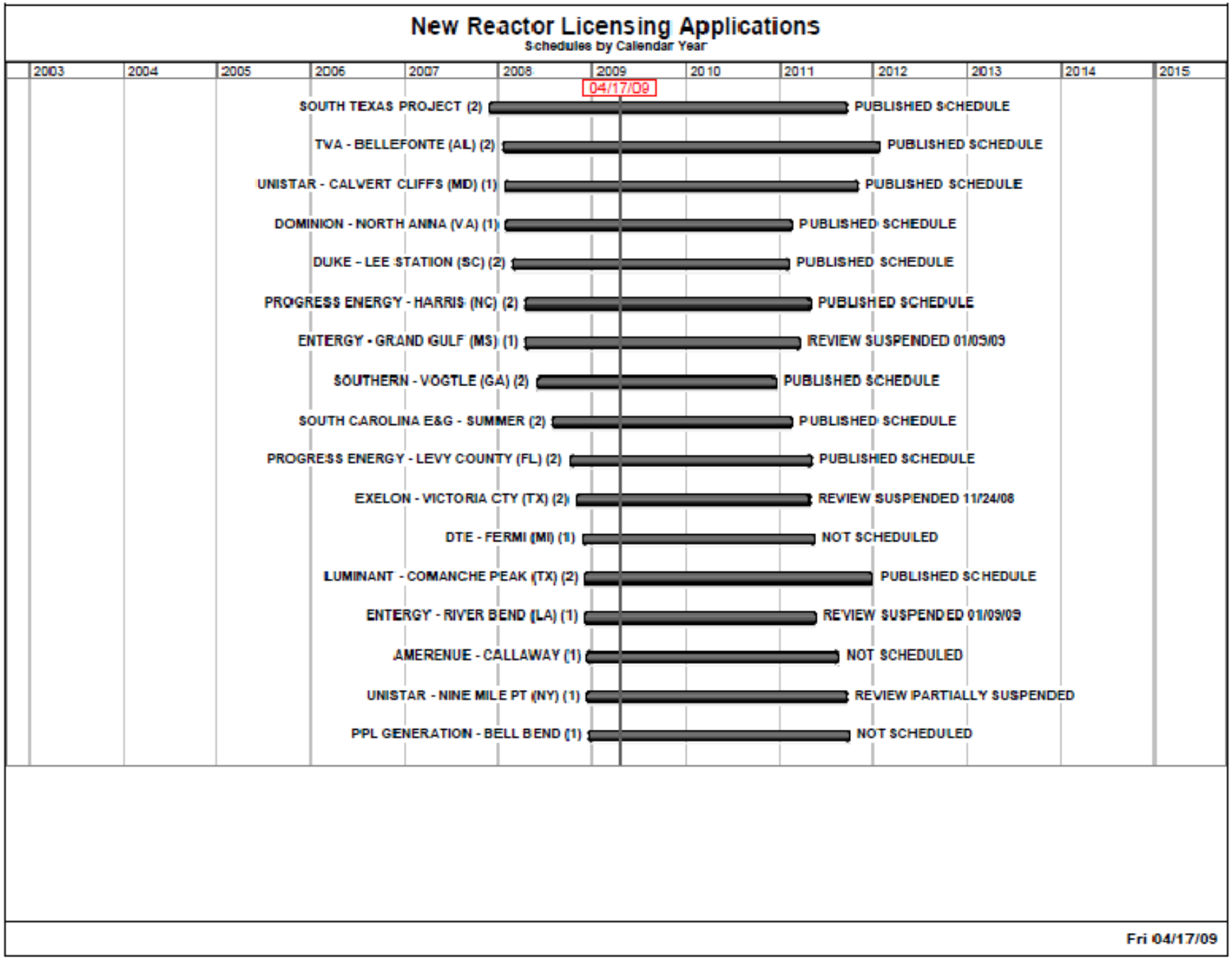
New Reactor Applications Under Review

- 17 Combined License Applications (one includes a request for a Limited Work Authorization)
- 3 Design Certification (DC) Applications
  - General Electric Economic and Simplified Boiling Water Reactor (ESBWR)
  - AREVA Evolutionary Power Reactor (EPR)
  - Mitsubishi U.S. Advanced Pressurized Water Reactor (US APWR)
- 1 Amended DC Application
  - Westinghouse AP1000 Certification Amendment
- 1 Early Site Permit/Limited Work Authorization
  - Vogtle


New Reactor Licensing Applications
Schedules by Calendar Year
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
04/17/09
SOUTH TEXAS PROJECT (2)
PUBLISHED SCHEDULE
TVA - BELLEFONTE (AL) (2)
PUBLISHED SCHEDULE
UNISTAR - CALVERT CLIFFS (MD) (1)
PUBLISHED SCHEDULE
DOMINION - NORTH ANNA (VA) (1)
PUBLISHED SCHEDULE
DUKE - LEE STATION (SC) (2)
PUBLISHED SCHEDULE
PROGRESS ENERGY - HARRIS (NC) (2)
PUBLISHED SCHEDULE
ENTERGY - GRAND GULF (MS) (1)
REVIEW SUSPENDED 01/05/09
SOUTHERN - VOGTLE (GA) (2)
PUBLISHED SCHEDULE
SOUTH CAROLINA E&G - SUMMER (2)
PUBLISHED SCHEDULE
PROGRESS ENERGY - LEVY COUNTY (FL) (2)
PUBLISHED SCHEDULE
EXELON - VICTORIA CTY (TX) (2)
REVIEW SUSPENDED 11/24/08
DTE - FERMI (MI) (1)
NOT SCHEDULED
LUMINANT - COMANCHE PEAK (TX) (2)
PUBLISHED SCHEDULE
ENTERGY - RIVER BEND (LA) (1)
REVIEW SUSPENDED 01/09/09
AMERENUE - CALLAWAY (1)
NOT SCHEDULED
UNISTAR - NINE MILE PT (NY) (1)
REVIEW PARTIALLY SUSPENDED
PPL GENERATION - BELL BEND (1)
NOT SCHEDULED
Fri 04/17/09

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NRO STRATEGIC GOALS

I. *By the end of FY2011,*
the NRC will have completed the review of

- *Design Certifications,*
- *Limited Work Authorizations, and*
- *Combined Licenses*

– *needed for each of the new nuclear projects that are expected to start operating during CY2016-CY2017.*

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NRO STRATEGIC GOALS

II. By the end of FY2011, the NRC will

- *have developed the necessary construction inspection and support infrastructure (inspectors and training programs) and*

- *have under development additional support infrastructure (license examination programs, simulators, etc.) to implement the construction inspection, operator licensing, and construction oversight programs*

needed for all of the new nuclear projects that are expected to load fuel during CY2016-CY2017.

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NRO STRATEGIC GOALS

III. By the end of FY2011, the NRC will have established an Advanced Reactor Organization

- *capable of conducting*
  - *the infrastructure development,*
  - *pre-application review,*
  - *Design Certification and COL review activities*
    - » *needed for the Congressionally mandated NGNP*
    - » *and to address generic licensing infrastructure development applicable to additional reactor technologies as they develop.*

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NRO STRATEGIC GOALS

IV. Provided the above expectations can be met, the NRC will assign available resources to the review of

- *Design Certifications,*
- *Early Site Permits,*
- *Limited Work Authorizations, and*
- *Combined Licenses*

that will be needed for the nuclear projects that are expected to undertake construction with the intent of operating during the CY2016-CY2020 time frame.

Looking Back…

- Challenges:
  - Infrastructure
  - Policies and procedures

- Successes:
  - Part 52 rulemaking
  - Limited Work Authorization rulemaking
  - Updated hearing policy
  - Interim staff guidance process
  - Designed Centered Approach

Licensing Challenges

- Challenge:
  - Large number of applications being reviewed
- Successes:
  - Maintaining standardization
  - Four-phase review approach for subsequent combined license applications
  - NRO Revised Goals

Licensing Challenges

- Challenge:
  - First of a Kind Reviews
- Success:
  - Finding the Safety Bulls Eye

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Resources

time

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Resources

time

Licensing Challenges

- Challenge:
  - Divide and Conquer
- Successes:
  - Know where the issue falls: Vendor vs. Applicant
  - Carefully consider the sequencing of DCs vs. COLs

Licensing Challenges

- Challenge:
  - What is reasonable assurance of safety
- Successes:
  - Get big picture
  - Do not assume or jump to conclusions
  - Work with the end in mind
  - Know what success looks like (different views)
  - Document agreements or actions
  - Understand why or how information will be used
  - Communications

Licensing Challenges

- Challenge:
  - Substantial revision of combined license applications based on business environment changes
- Successes:
  - Communicate early and often
  - Need for industry to prioritize

Licensing Challenges

- Challenge:
  - Substantial design changes during review
- Successes:
  - “Lock down” design
  - Communicate early and often
  - Maximize the amount of information provided to the staff

Licensing Challenges

- Challenge:
  - Information required by the regulations either not available or not provided
- Successes:
  - Recognizing when a new approach is needed
  - Formulating that new approach, consistent with our mission and values (i.e., independent, open)

Licensing Challenges

- Challenge:
  - Waiting on Submittals
- Successes:
  - Understand what is expected
  - Understand the issues
  - Communicate often (identify your concerns)
  - Do not assume
  - Staff follow-up/prompting
  - Problem solving approaches

Licensing Challenges

- Challenge:
  - Building Relationships
- Success:
  - Communicate
    - Technology
    - Human

Licensing Challenges

- Challenge:
  - Meeting the needs of the Federal Emergency Management Agency (FEMA)
- Successes:
  - Working together to resolve scheduling issues
  - Working together to resolve when to address operating vs. application issues.

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Looking Forward…

- Challenges:
  - Transition from initial licensing to construction and beyond
  - Sequencing of reviews
  - Possible change in the rulemaking process
  - Review of design certification renewals
  - ITAAC verification and closure

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How Can You Assist?

- Keep the NRC fully and promptly informed
- Meet your schedules
- Quality responses
- Build relationships

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Thank you for the opportunity to speak today