

# Construction Inspection Program

Mary Ann Ashley, Team Leader  
Construction Inspection Program  
US Nuclear Regulatory Commission  
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# Current Construction Outlook

AP1000 – COL applications

5 companies, 6 sites, 11 units

ESBWR – COL applications

3 companies, 3 sites, 3 units

EPR – COL applications

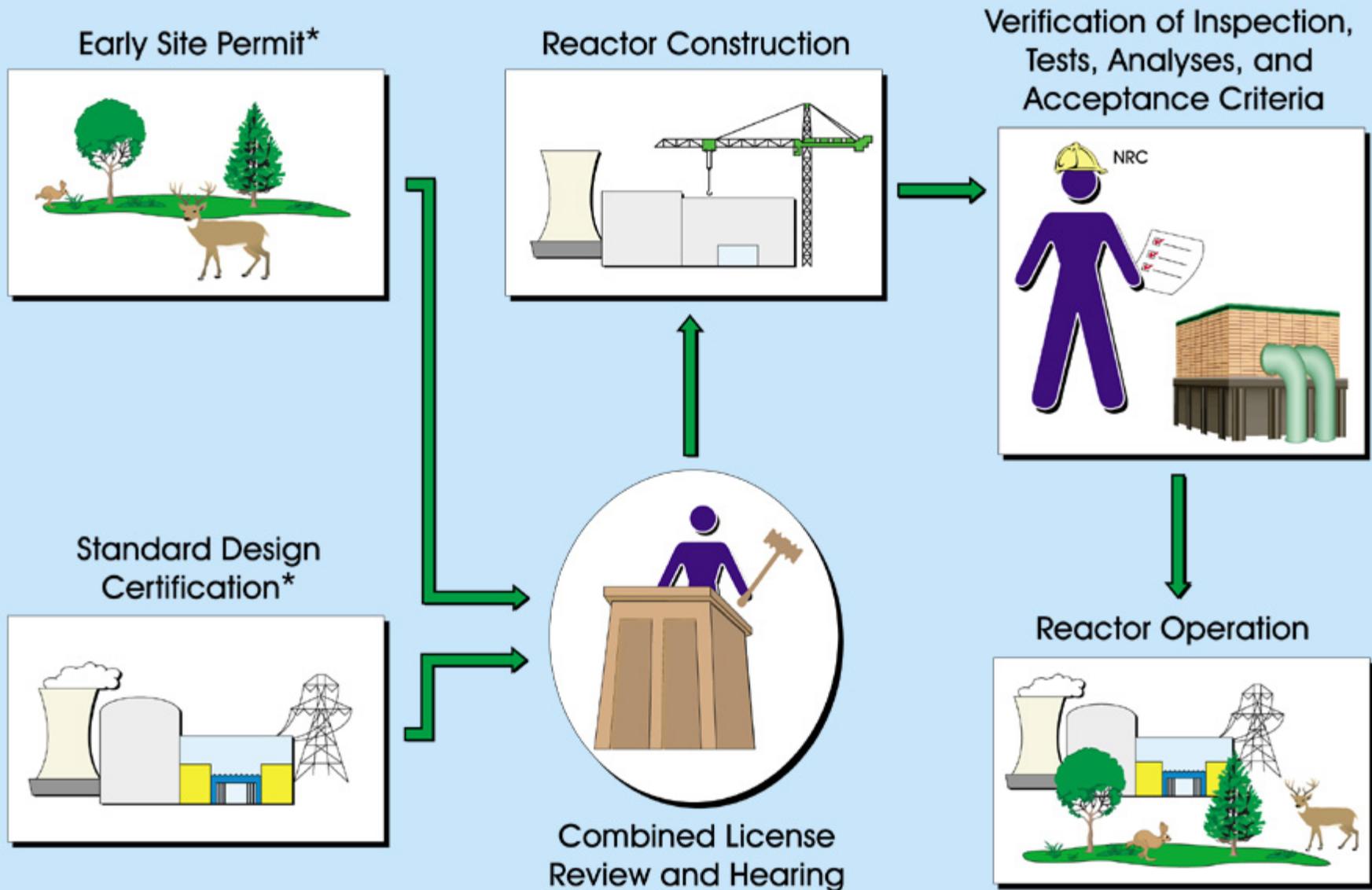
1 company, 2 sites, 3 units

ABWR – COL applications

1 company, 2 units

Unknown technology – Design Certification

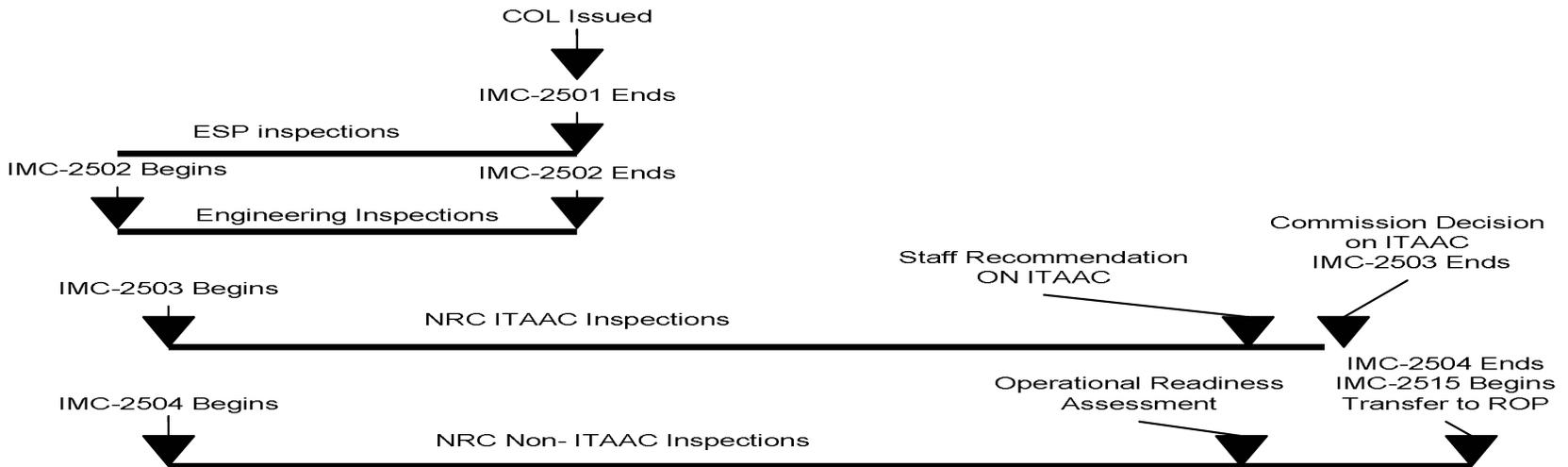
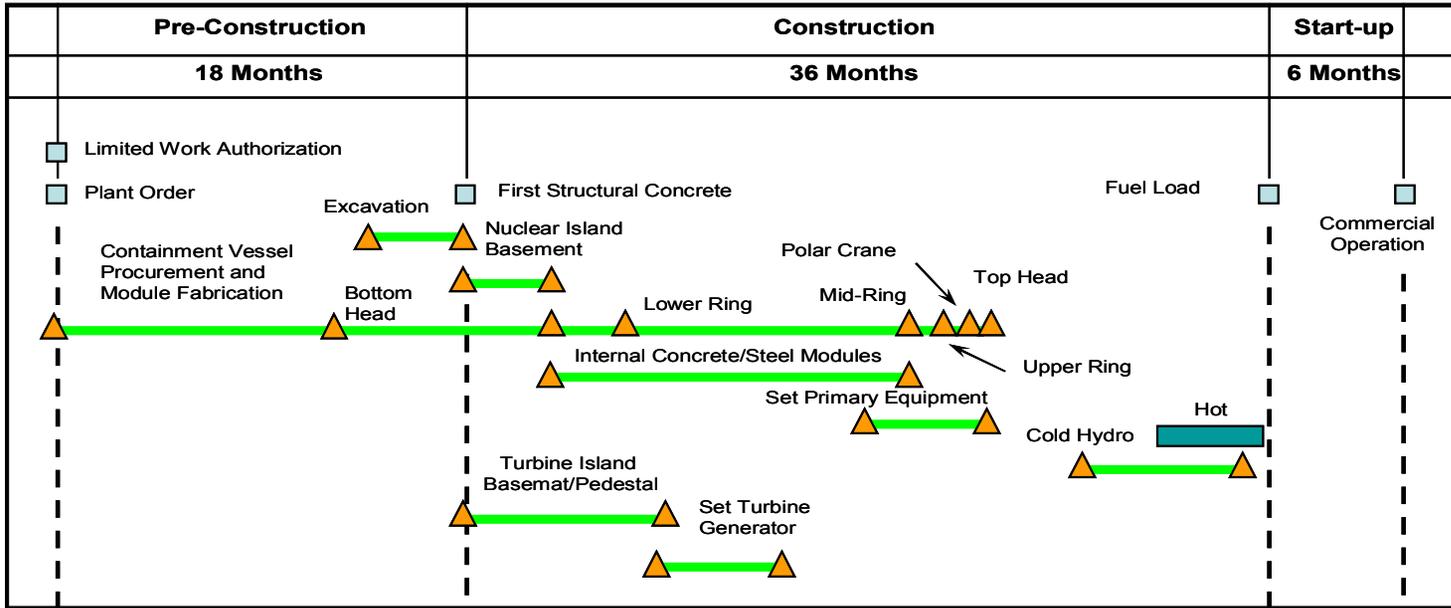
# Combined Licenses, Early Site Permits, and Standard Design Certifications



# Inspection Program Structure

- Inspection Manual Chapters – keyed to organization of approach in 10 CFR Part 52
  - IMC-2501: Early Site Permits
    - 5 Inspection Procedures
  - IMC-2502: Inspections to Support Issuing a COL
    - 9 Inspection Procedures
  - IMC-2503: Inspections of ITAAC-Related Work
    - 25 Inspection Procedures – addressing the specific attributes of the different kinds of ITAAC
  - IMC-2504: Inspections of Non-ITAAC Work
    - Approximately 150 Inspection Procedures – addressing the programs and processes common to all work activities; pre-op and startup testing; operational programs

## Anticipated Nuclear Power Plant Construction Schedule and Construction Inspection Program Implementation



# What is different this time?

- Combined license (COL) rather than CP and OL
  - Utility will hold an operating license prior to starting construction
- ITAAC
  - Required Commission finding
  - Greater cooperative licensing and inspection effort
- Faster pace using Modular Construction
- Energy Policy Act
  - Standby support – delay insurance

# What is not different this time?

- How inspectors will look at work-in-progress in the field.

# What is an ITAAC?

- Inspections, tests, analyses and aceptance criteria
- Provision to a combined license
- Successful completion of all ITAAC demonstrates that plant constructed in accordance with the Atomic Energy Act, the regulations, and the license

# Format of an ITAAC

## Design commitment

- what is the target?

## Inspections, tests and analyses

- what observations or examinations will be done by the licensee to determine if the target was met?

## Acceptance Criteria –

- what does success look like?

# How does an ITAAC work?

- The list of ITAAC are submitted with the COL application.
- NRC reviews and approves the ITAAC and incorporates them as part of the license.
- NRC inspectors watch the licensee perform ITAAC or ITAAC-related activities during construction.

# Not all ITAAC are created equal

<b>Design Commitment</b>	<b>Inspection Test Analysis</b>	<b>Acceptance Criteria</b>
Safety related displays in the main control room can be retrieved	Simple inspection	Safety related displays can be retrieved in the main control room
ASME code piping retains pressure boundary integrity at design pressure	Report demonstrating piping meets ASME code	A report exists and concludes that piping meets requirements of ASME code

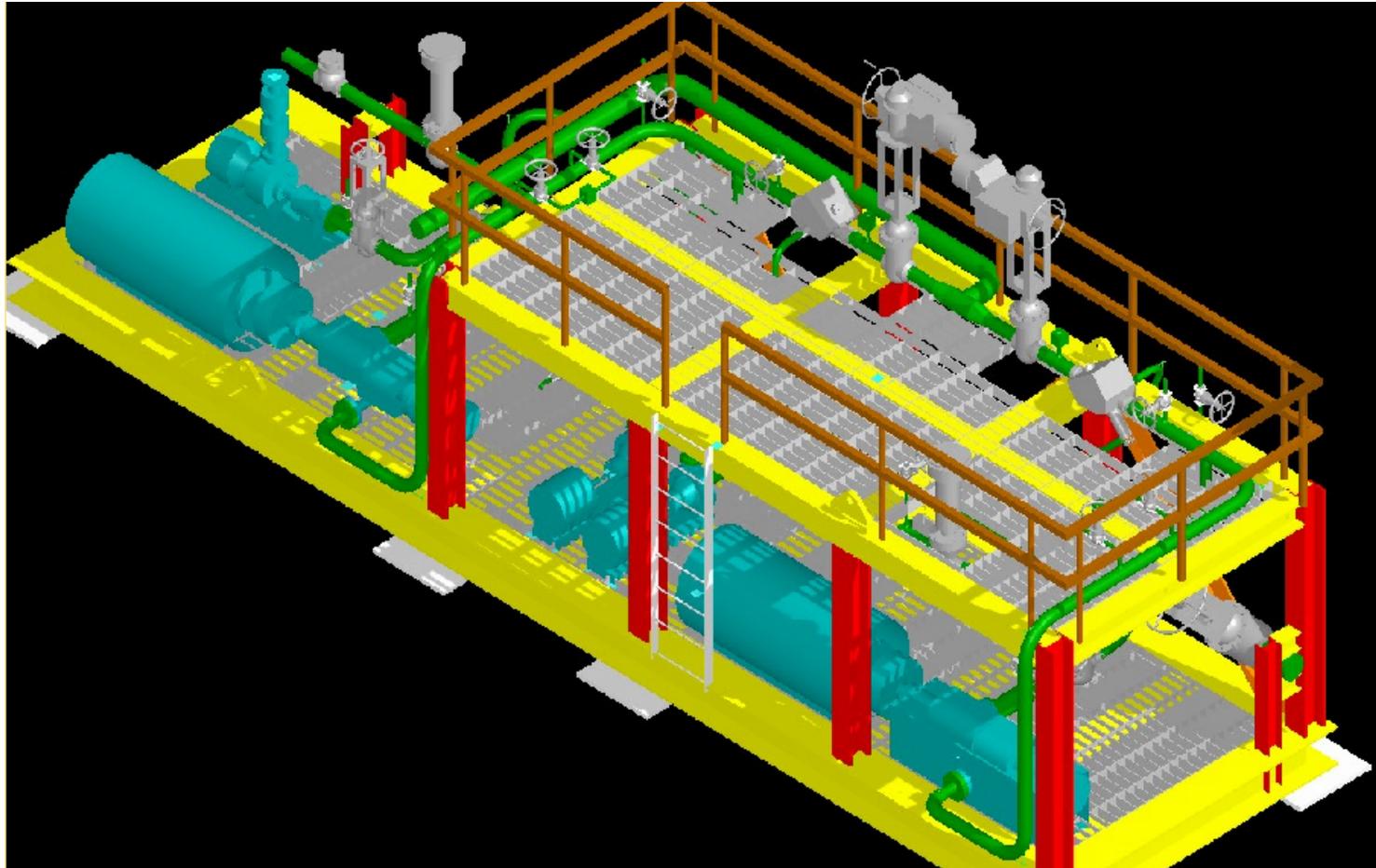
## What the differences mean to the CIP:

- COL vs a CP and OL means:
  - Decisions that were made to support an OL will now be made much earlier and on less specific information
  - Inspection program will check on implementation of licensee commitments used to obtain the COL
- Having ITAAC means:
  - ITAAC-based, not system-based inspection procedures
  - Linking to and tracking inspection results by ITAAC to support Commission finding
  - Selecting which ITAAC should receive direct inspection
  - Developing tools so that licensing and inspection can share information
  - Ensuring that the NRC review and acceptance of the ITAAC completion does not cause unnecessary delays

# What the differences mean to the CIP

- Faster pace and modular construction means:
  - Potential for more inspections at vendor sites
    - potentially off-shore
  - Need for better scheduling tools for NRC
  - Must have the inspection staff ready to do the job
- Enforcement – still to be worked out

# Startup Feedwater Pump Module – AP1000



# Closing an ITAAC

- The licensee informs the NRC when each ITAAC has been met
- NRC reviews ITAAC closeout letters:
  - Licensing performs acceptance review
  - Construction inspection group examines inspection record for that ITAAC
  - Licensing documents the basis for the ITAAC acceptance criteria being successfully met
- A notice is published in the *Federal Register*

# Non-ITAAC Inspections

What else are we going to inspect?

- Licensee Construction Programs
- Corrective Action Program
- Control and Oversight of Contractors
- Design Change Process
  
- Licensee Operational Programs
- Start-up Testing Program
- Pre-Op Testing Program
- Transition to the ROP

# Lessons from the Past

- A steep learning curve for NRC and licensees
- Construction problems
  - Inadequate storage and labeling
  - Inadequate procedures
  - Inadequate training of construction staff
  - Inadequate process controls
  - Inadequate contractor oversight

# What are the most significant NRC challenges?

- Overconfidence
- Keeping pace with the work
- Keeping focused
- Remembering the Part 52 context
- Documenting as you go
- Dealing with the diversity of designs