



US Regulatory Environment for New Reactor Applications

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Discussion Topics

- Codes and standards in new reactor reviews
- Globalization and international cooperation
- Current licensing reviews
- Standardization
- Construction inspection program



Regulations

- Energy Re-organization Act of 1974
- NRC establishes regulatory requirements for codes and standards
- Code of Federal Regulations (CFR)
- Title 10 CFR addresses “Energy”
- Parts 50 and 52 of Title 10 contain regulations for licensing Nuclear Power Plants
- Section 50.55a contains the regulations for codes and standards (10 CFR 50.55a)



Roles

- NRC establishes regulatory requirements and issues guidance
- Code organizations establish code requirements
- Industry develops programs and technology to meet these requirements
- All participate in an open consensus process
- Common Goals
 - Safe plant operation
 - Practical requirements
 - Cost-effective technology



Regulatory Process

- NRC requires the use of certain codes and standards
- Codes and standards are incorporated by reference into the regulations through rulemaking
- Rulemaking process follows Administrative Procedures Act, 1946
- Rulemaking documents published in the Federal Register for public participation
- Updates to 10 CFR 50.55a

Codes

- 10 CFR 50.55a “requires” the use of ASME Codes
 - ASME BPV Code, Section III for design
 - ASME BPV Code, Section XI for in-service inspection
 - ASME OM Code for in-service testing
- NRC approves, conditions, or disapproves ASME Code cases
 - Regulatory Guide 1.84 (Section III)
 - Regulatory Guide 1.147 (Section XI)
 - Regulatory Guide 1.192 (OM Code)
 - Regulatory Guide 1.193 (code cases not approved)

Standards

- 10 CFR 50.55a “requires” the use of IEEE Standards
 - IEEE Std. 603, Criteria for Safety Systems
 - IEEE Std. 279, Criteria for Protection System
- NRC regulations allow the use of alternative codes and standards when:
 - The alternative provides an acceptable level of quality and safety, or
 - Compliance with 10 CFR 50.55a would result in a hardship without a compensating increase in quality and safety.



International Experience

- Imported reactor vessel replacement heads must meet the original design specification requirements.
- Current design certification applications from France and Japan specify the use of ASME Code, Section III.
- Foreign material specifications are approved by ASME or NRC as alternatives to ASME Code material requirements.
- The Multinational Design Evaluation Program (MDEP) is assessing code differences and possible reconciliation.



International Cooperation

- A strong shared interest in assuring nuclear safety around the world
- International cooperation in resolving key differences in engineering codes and standards, construction practices, quality assurance practices and regulatory practices
 - Multinational Design Evaluation Program (MDEP)
 - Nuclear Energy Agency (NEA)
 - International Atomic Energy Agency (IAEA)



Key MDEP Near-Term Goals

- Share experience on specific reactor designs under current review
- Initiate a multinational vendor inspection program
- Explore convergence of codes and standards
- Assess similarities in regulatory review for severe accident analysis
- Collect, share, and use construction experience in new reactor reviews
- Account for operating experience in regulatory reviews for new reactors



MDEP Activities 2008-2010

Codes and Standards Working Group

- Compare ASME (*US*), AFCEN (*France*), JMSE (*Japan*), KEA (*Korea*), CSA (*Canada*) and the *Russian Norms Organization* for design of pressure boundary components
- Identify beneficial areas for convergence
- Explore potential options for reconciliation of differences

Vendor Inspection Cooperation Working Group

- Share information and observe each other's inspections
- Organize multinational vendor inspections
- Develop a framework for implementing multinational vendor inspections



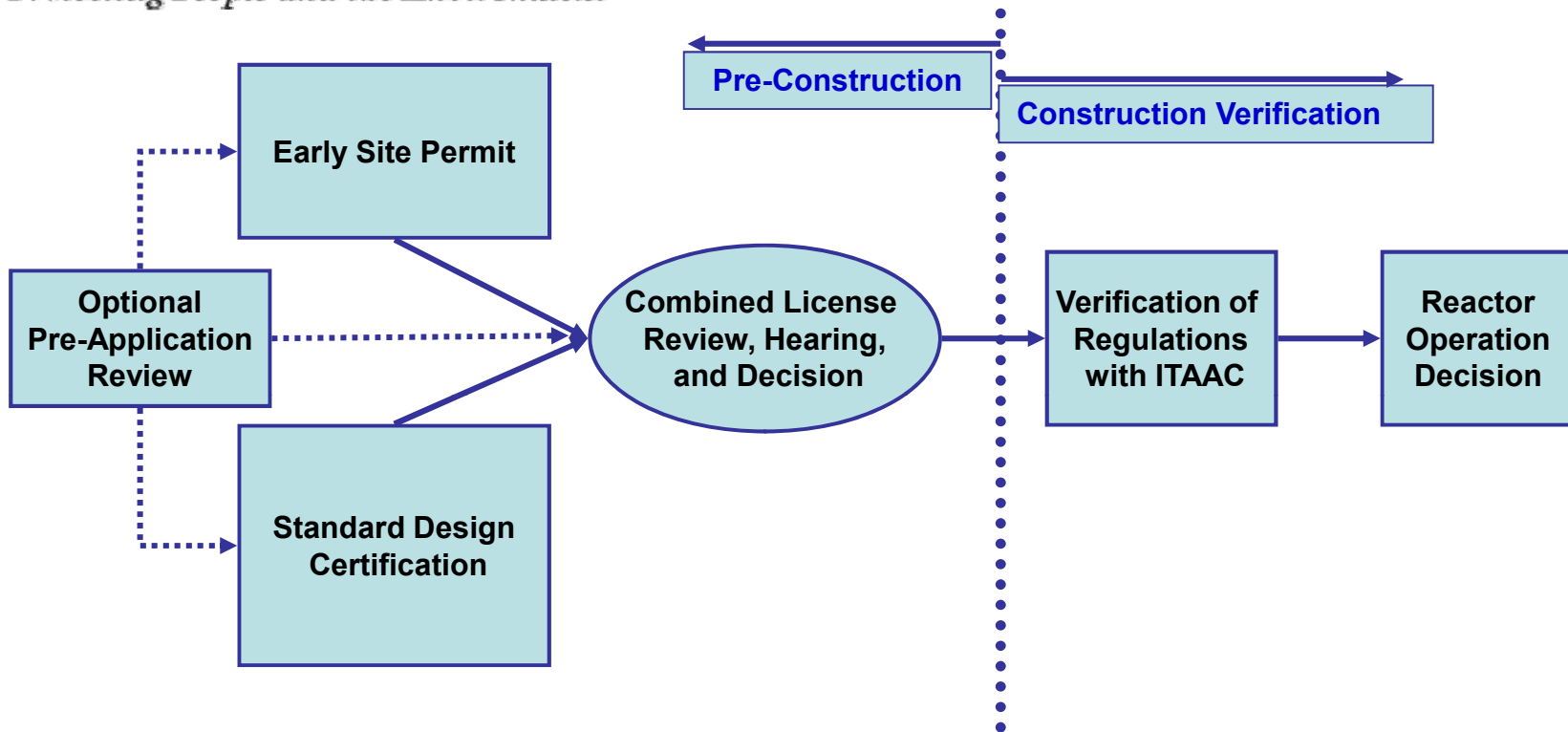
Globalization Issues

- Global supply chain
- Fewer qualified component suppliers
- Additional lead time
- Some manufacturers are unfamiliar with requirements for nuclear-grade components
- New reactor projects in the U.S. may employ multinational modular construction techniques
- Concerns continue to arise regarding counterfeit items
- Resources and access to oversee the global marketplace are critical

New Reactor Reviews

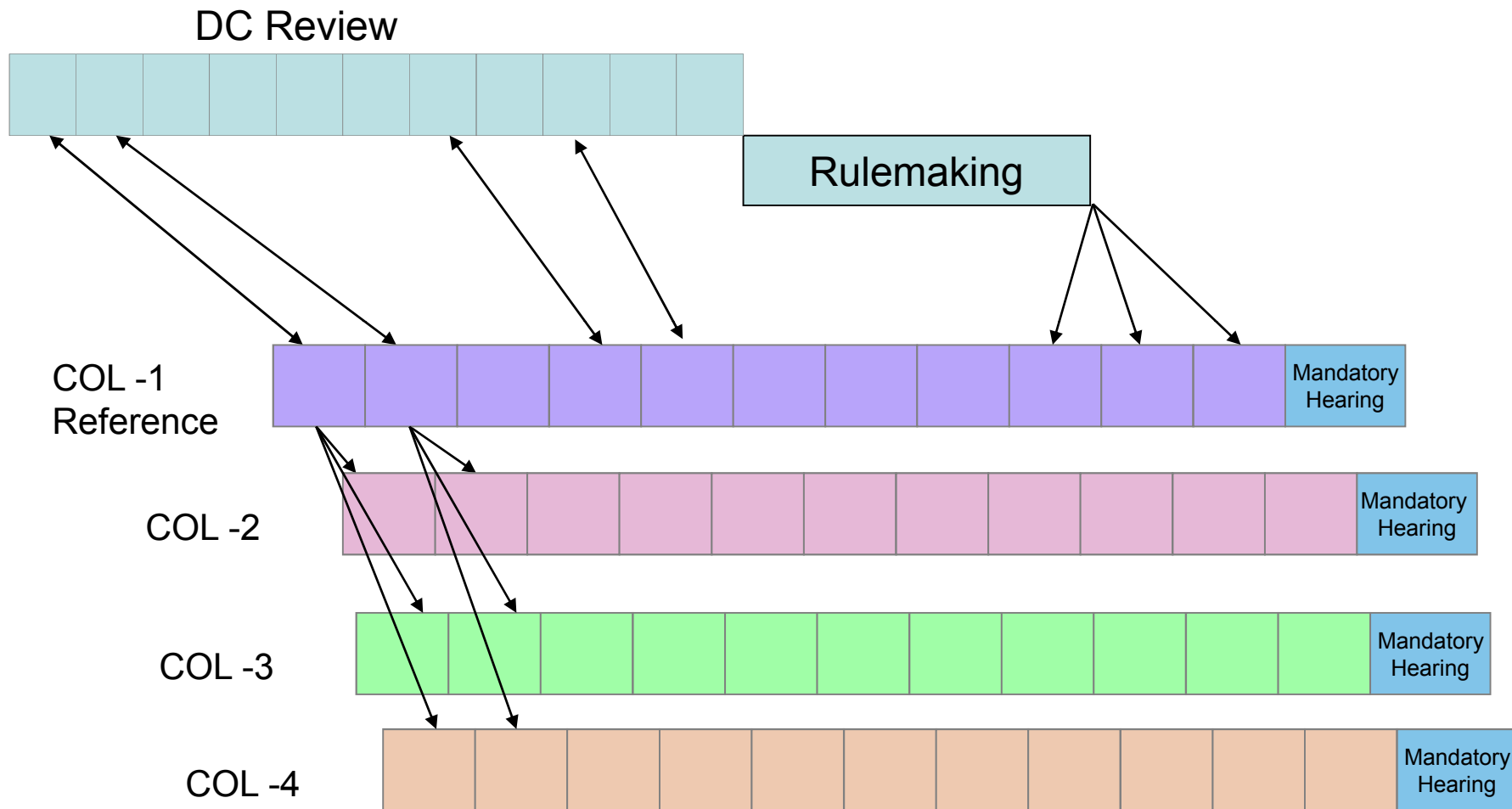
- Current Applications
 - 17 Combined License (COL) Applications
 - 3 Design Certification (DC) Applications
 - 2 Amended DC Application
 - 1 Early Site Permit (ESP)
 - 1 Limited Work Authorization
- Issued
 - 4 DCs
 - 3 ESPs

Part 52 Licensing



- Licensing decisions finalized before major construction begins
- Inspections w/ITAAC to verify construction
- Limited work may be authorized before COL issuance

Design-Center Approach



Standardization

- Applicants formed Design-Centered Working Groups (DCWG) to standardize applications
- Quality benefitted significantly from DCWG meetings and interactions
- Designs change during the review and cause rework and extend schedules
- First-of-a-kind technical and procedural issues
- Overall more efficient application reviews are expected



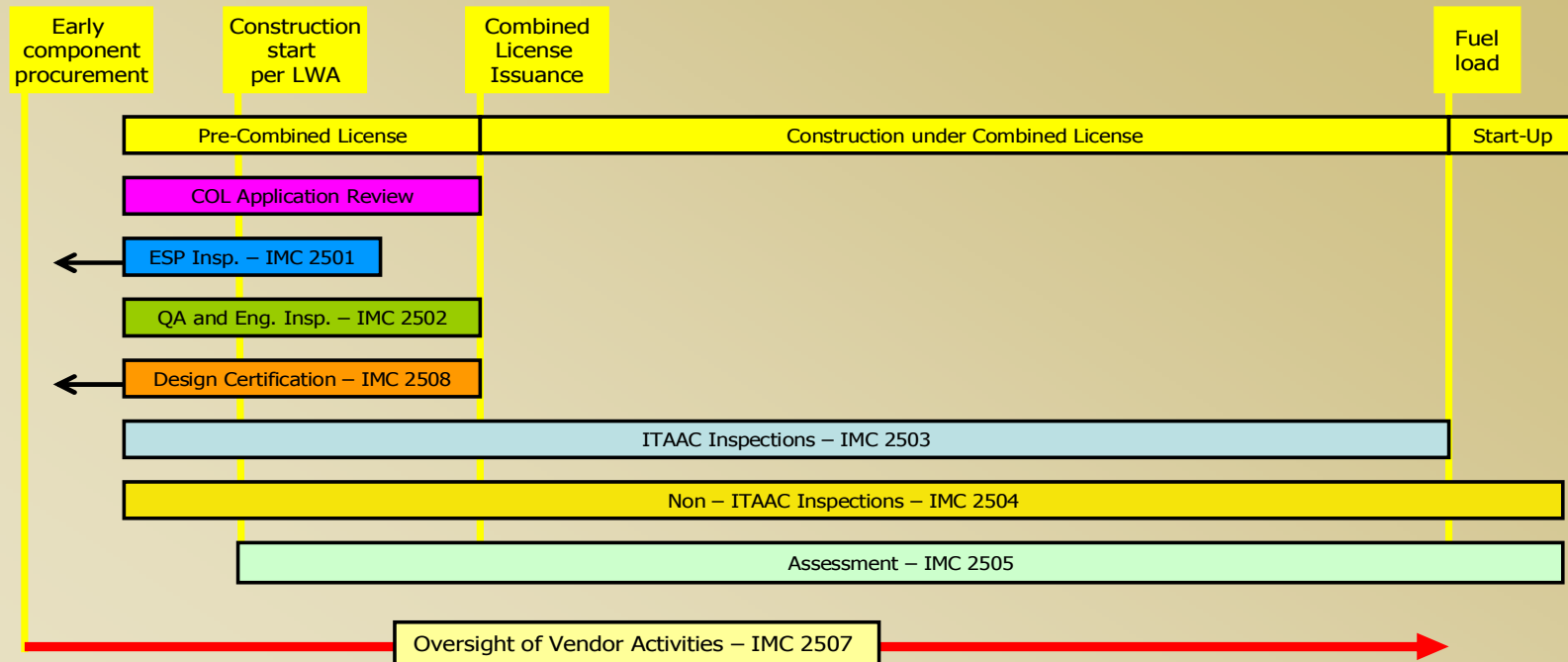
Construction Inspection Program Objectives

- Ensure that plants are constructed in accordance with approved designs and safety regulations
- Determine operational readiness
- Communicate results to all stakeholders
- Ensure effective transition to operating facility oversight program



NRC CONSTRUCTION OVERSIGHT HAS MULTIPLE COMPONENTS

Oversight will assure plants are constructed as designed.





Vendor Inspections

- NRC inspects vendor performance for compliance with regulations
- NRC oversees licensee audits of vendors
- NRC does not certify, accredit, or endorse any vendor
- Focus on ensuring the integrity of the worldwide supply chain



International Activities

- NRC inspector technical exchanges
- Bilateral cooperative vendor inspection activities in North America, Europe, and Asia
- Active member of the MDEP Vendor Inspection Cooperation Working Group

Summary

- NRC regulations incorporate codes and standards by reference but allow for alternatives.
- Active international cooperation in resolving key differences in engineering codes and standards, construction practices, quality assurance practices and regulatory practices.
- Resources and access to oversee the global marketplace are critical to ensuring the integrity of the worldwide supply chain.
- Standardization of applications is essential for timely licensing and construction.