

Licensing of New Reactors

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William “Butch” Burton

Chief

Rulemaking and Guidance Development Branch

Office of New Reactor (NRO)

Nuclear Regulatory Commission

WWW.MWFTR.COM

Agenda

- US NRC Regulations
- US NRC Licensing Process
 - Early Site Permits
 - Standard Design Certifications
 - Combined License Applications
 - Limited Work Authorizations
- Construction Inspection Program

Regulations

- Atomic Energy Act of 1954
- Energy Re-organization Act of 1974 creates NRC
- NRC establishes regulatory requirements
- Code of Federal Regulations (CFR)
- Title 10 CFR addresses “Energy”
- Parts 50 and 52 of Title 10 contain processes for licensing Nuclear Power Plants
- Part 52 contains processes for New Reactors

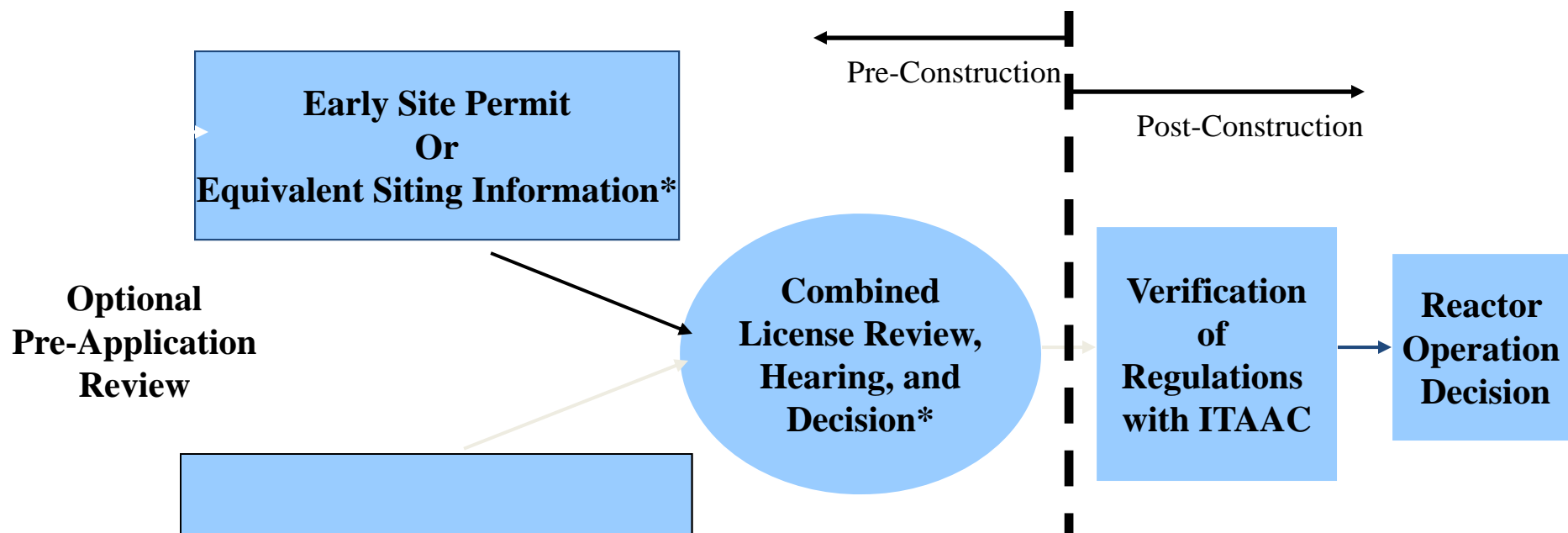
Required Reviews for New Reactor Licensing

- Applicant Qualifications
- Design Acceptability
- Environmental Impacts
- Site Safety
- Operational Programs
- Verification with Inspections, Tests, Analyses and Acceptance Criteria (ITAAC)

Part 52 Licensing Processes

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

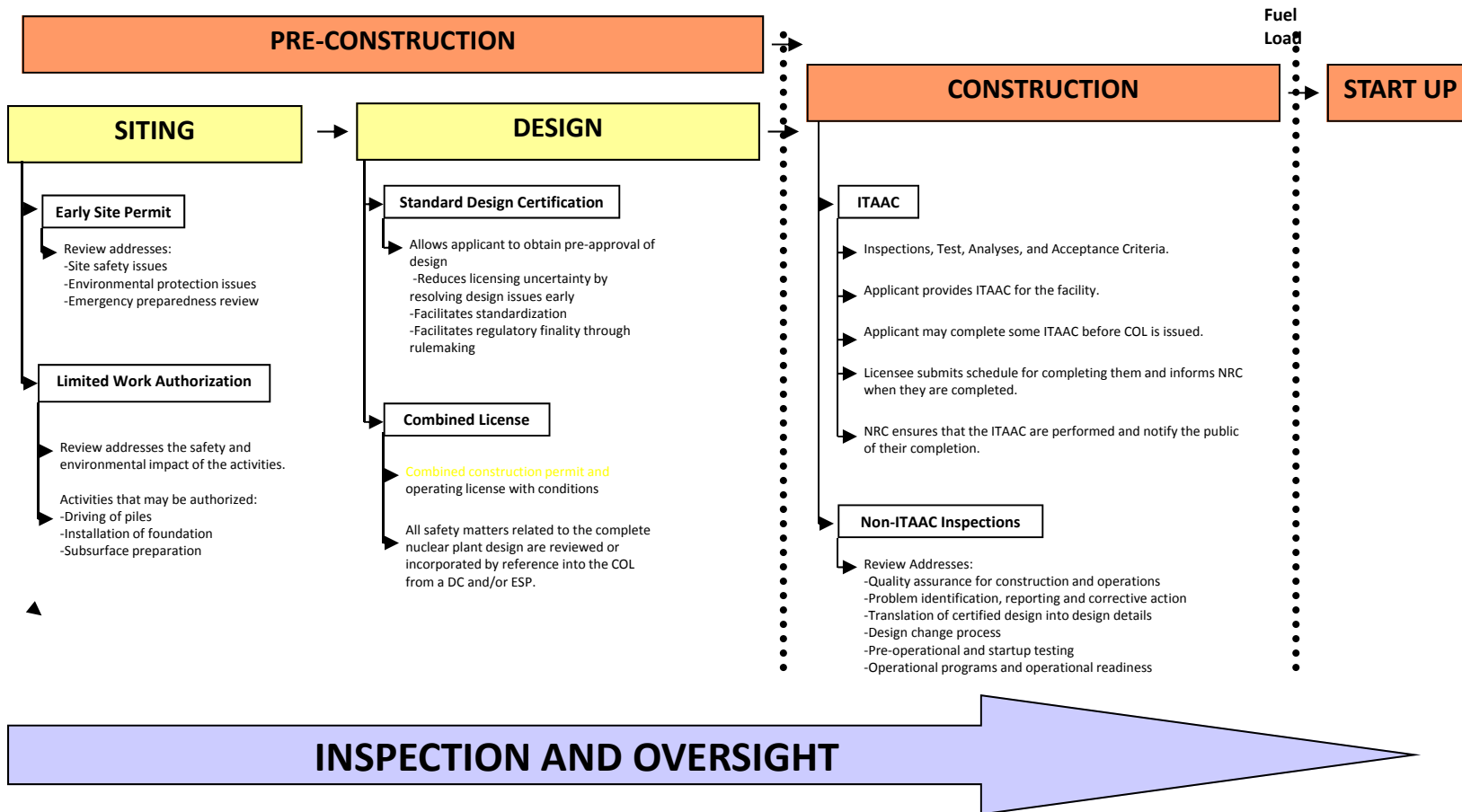
Part 52 Licensing Process



*A combined license application can reference an early site permit, a standard design certification, both, or neither. If an early site permit and/or a standard design certification is not referenced, the applicant must provide an equivalent level of information in the combined license application.

Part 52 Licensing Process

USNRC LICENSING PROCESS



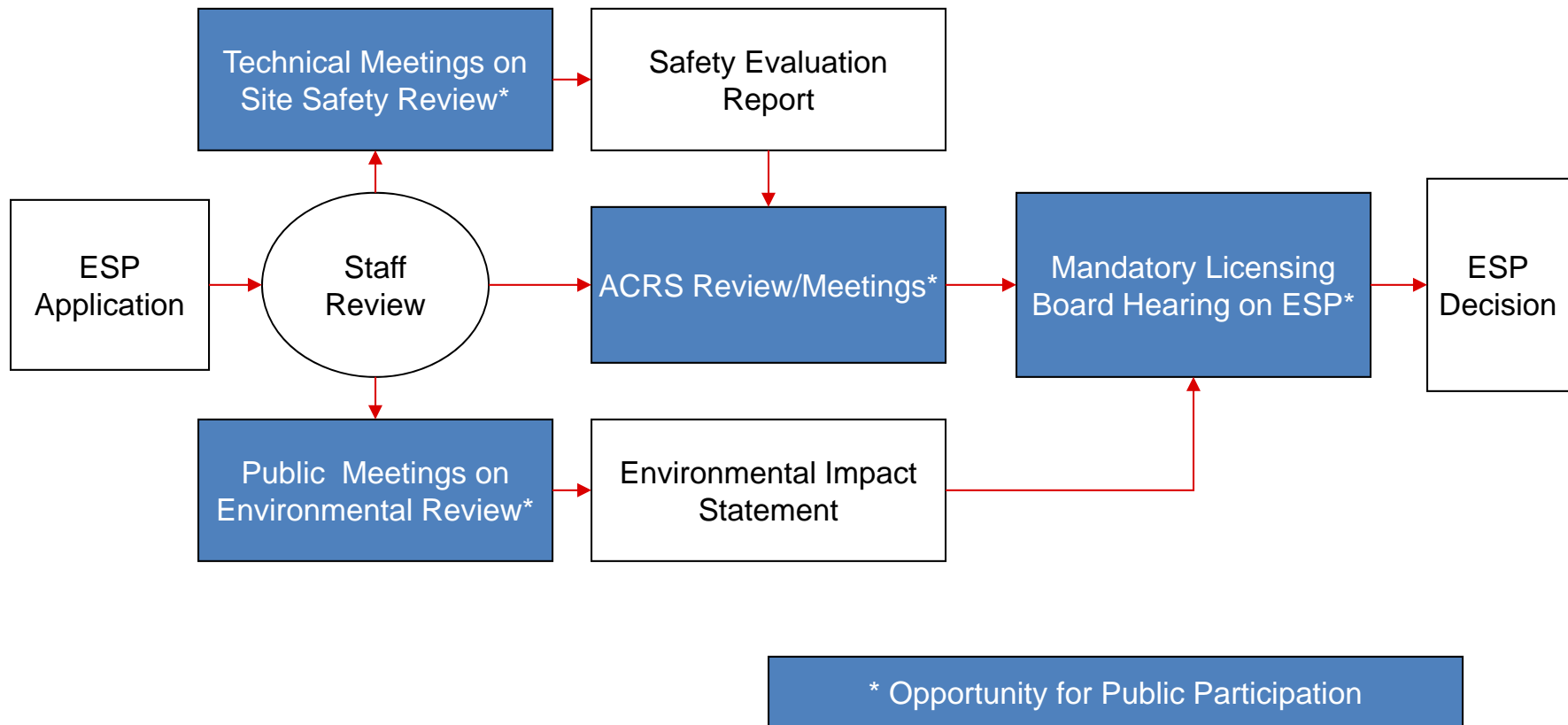
Early Site Permits (Subpart A)

- Allows applicant to “bank” a site
- Are licenses (partial construction permits)
- Good for 10-20 yrs + renewal
- Review Scope:
 - Site Safety
 - What the environment can do to the design
 - Environmental Impact
 - What the design can do to the environment
 - Emergency Preparedness

Early Site Permit Review

ESP Review addresses:	Issues <u>NOT</u> Required to be Considered in ESP Environmental Review (unless applicant addresses them):
Site safety issues (what the environment can do to the design)	Benefits assessment (e.g., “Need for power”)
Environmental protection issues (what the plant can do to the environment)	Alternative energy sources
Emergency Preparedness	

ESP Review Process



Approving a Site Without a Specified Plant Type

- Number, type, and thermal power level of the proposed facilities must be specified
- Alternatively, Plant Parameter Envelope (PPE) bounds variety of specified design parameters
- PPE compared to actual values at combined license stage
- If design characteristics exceed bounding PPE values of ESP, additional reviews conducted

Standard Design Certifications (Subpart B)

- Allows nuclear steam supply system (NSSS) vendor/applicant to obtain pre-approval of design (certified design becomes an Appendix to Part 52)
- Reduces licensing uncertainty by resolving design issues early
- Facilitates standardization
- Achieves regulatory finality through rulemaking
- Certification good for 15 yrs + renewal

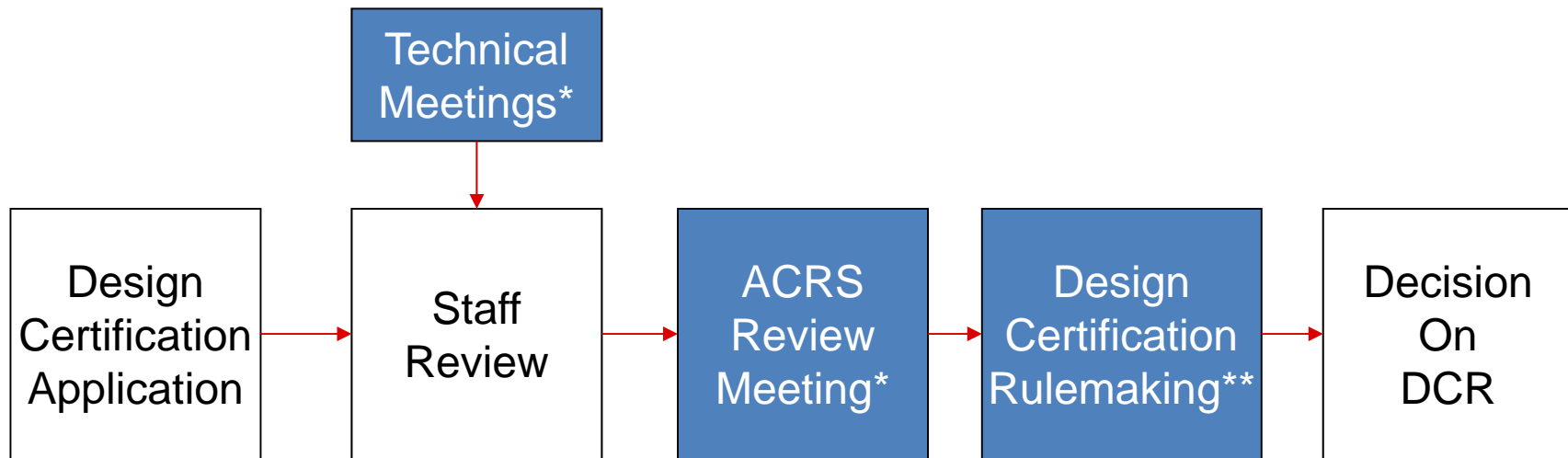
Standard Design Certification Review

What is Reviewed	What is Not Reviewed
Final Design Information	Site safety
Postulated Site Parameters	Environmental impact
Interface Requirements	Operational programs
Proposed technical resolutions of unresolved safety issues	Site-specific design features
Resolution of Severe Accident Issues	Selected design details
Inspections, Tests, Analysis, and Acceptance Criteria (ITAAC)	<ul style="list-style-type: none"> Rapidly changing technology (e.g., digital I&C, human factors)
Advanced Reactor Analysis and Testing Requirements	<ul style="list-style-type: none"> Design Acceptance Criteria (DAC) fills the void

Standard Design Certification Review

Designs Under Review	
AP1000 Amendment	Westinghouse
Advanced Boiling Water Reactor (ABWR) Amendment	General Electric Hitachi
Economic Simplified Boiling Water Reactor (ESBWR)	General Electric
Evolutionary Passive Reactor (EPR)	AREVA
U.S. Advanced Pressurized Water Reactor (US APWR)	Mitsubishi Heavy Industries , Ltd (MHI)

Design Certification Rule (DCR)



* Opportunity for Public Participation
** Notice and comment

Combined License (Subpart C)

- Combined construction permit and operating license with conditions (COL)
- Fundamental licensing process in Part 52 for reducing financial risk of applicants/licensees
- Can reference ESP, Certified Design, Design Approval, Manufacturing License, or none
- Lasts 40 yrs + renewal

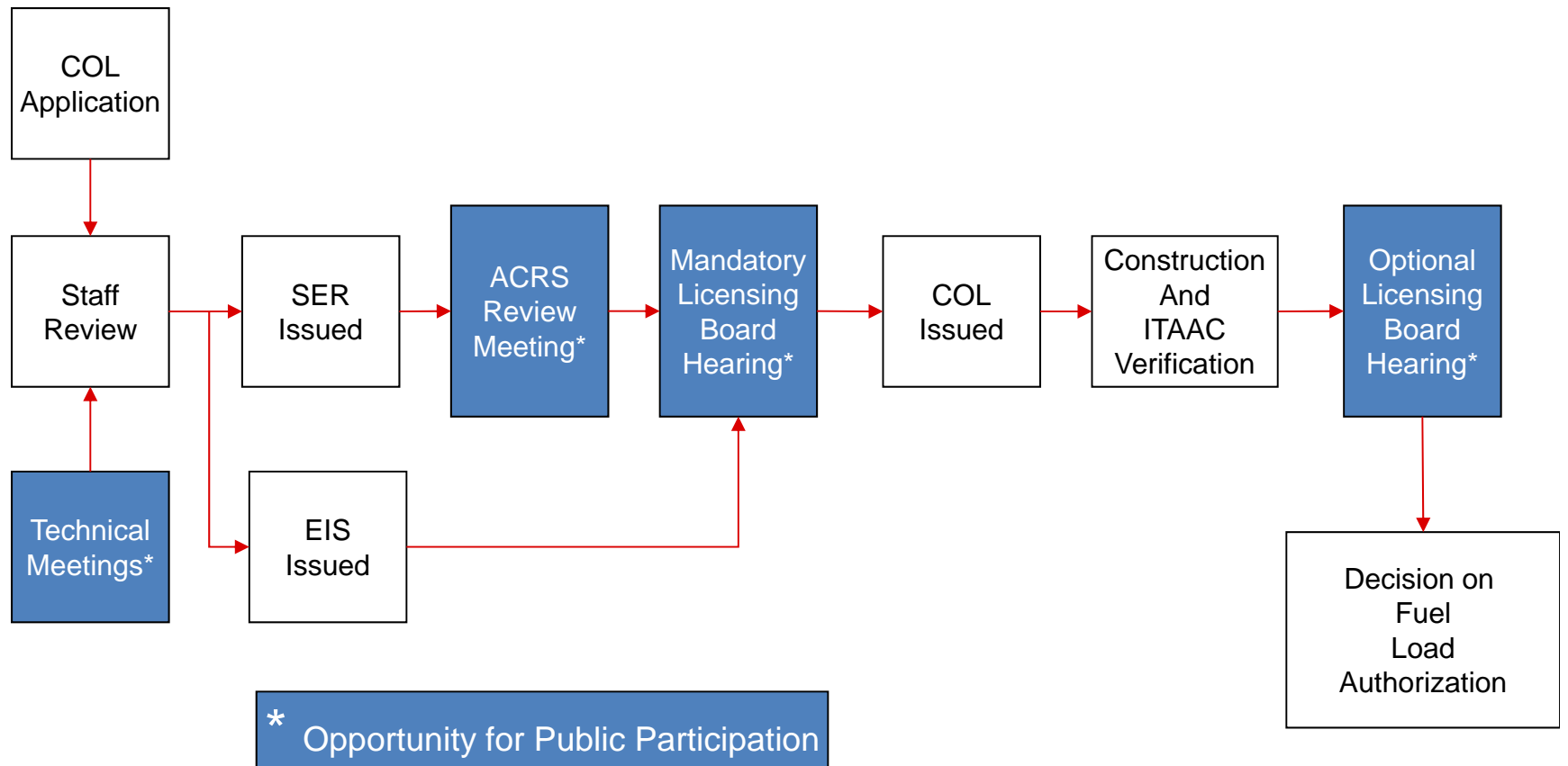
Safety Reviews for COLs

- COL application can reference:
 - Certified design
 - Design approval
 - Early Site Permit
 - Manufacturing License
 - None
- NRC's COL decision includes resolution of safety matters related to the nuclear power plant design
 - If an DCR is referenced, then the final safety analyses and resolution of safety matters is incorporated by reference into the COL application
 - If an DCR is not referenced, then all safety matters related to the complete nuclear plant design are reviewed

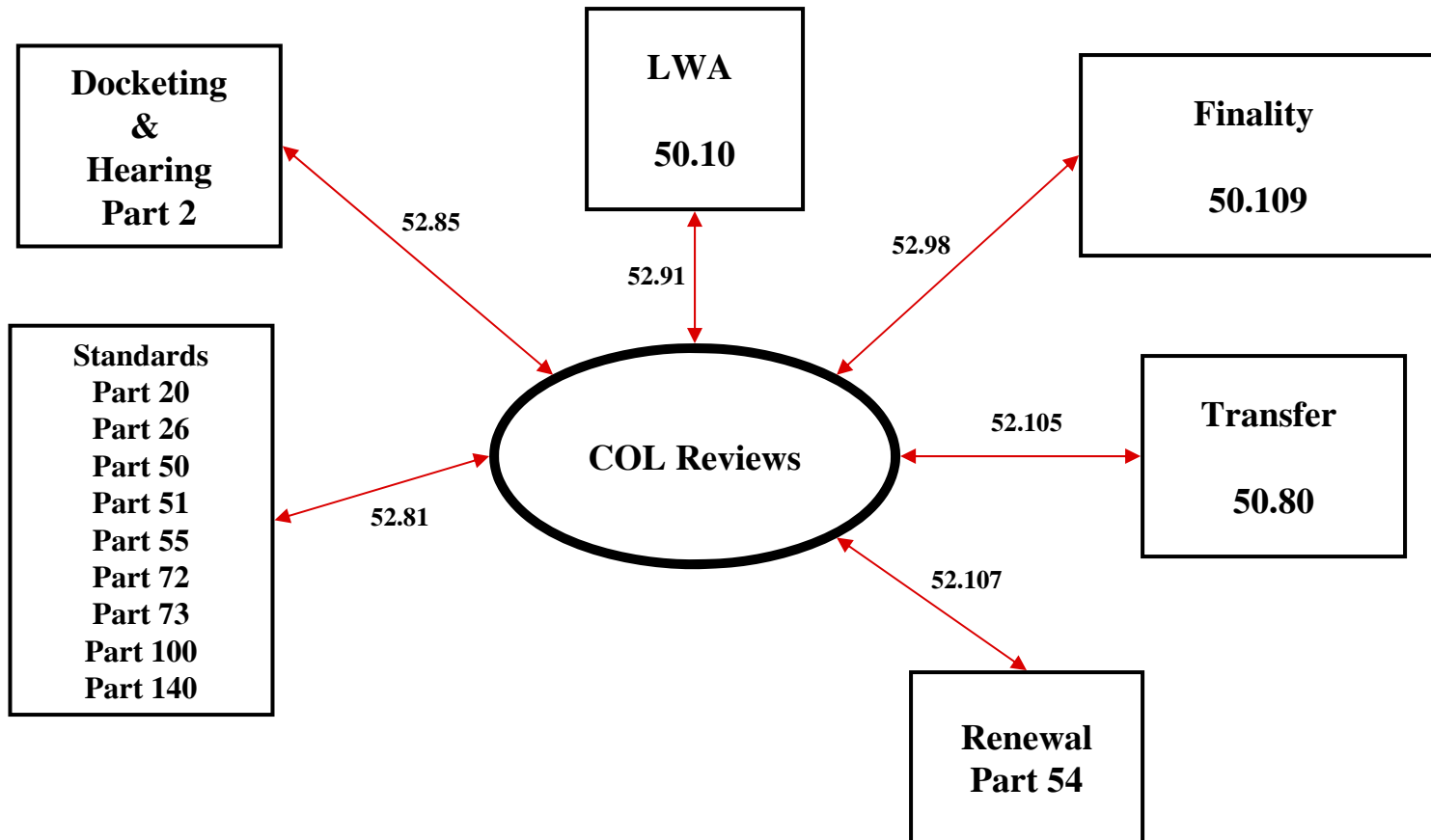
Environmental Reviews for COLs

- NRC's COL decision considers environmental impacts from construction & operation of nuclear plants
 - If an ESP is referenced, then the analyses and conclusions for resolved environmental issues are “tiered to” (i.e., incorporated by reference) or “adopted by” the COL EIS provided that there is no “new and significant information.”
 - If an ESP is not referenced, then all environmental issues related to construction and operation (including “alternative sites” and “need for power”) are considered.

COL Review Process



Part 52 Uses other Regulations



Inspections, Tests, Analyses and Acceptance Criteria (ITAAC)

- The inspections, tests, and analyses that the licensee shall perform, and the acceptance criteria that, if met, are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the AEA, and the Commission's regulations.

COL ITAAC

- Applicants must provide ITAAC for the facility (ESP, DC, COL)
- Applicants may complete some ITAAC before COL is issued
- Licensee shall submit schedule for completing ITAAC
- Licensee must inform NRC that ITAAC have been completed
- NRC shall ensure that the ITAAC are performed
- NRC shall notify the public of ITAAC completion

Limited Work Authorization (LWA)

- May request LWA in advance of COL
- Safety review of requested activities
- EIS for requested activities
- Site Redress Plan
- Bifurcated hearing on LWA activities

LWA Activities

- Activities that may be authorized under an LWA:
 - Driving of piles
 - Subsurface preparation
 - Placement of backfill, concrete, or permanent retaining walls
 - Installation of foundation

Construction Inspection Program Objectives

- Ensure that plants are constructed in accordance with approved designs and safety regulations
- Ensure operational readiness
- Communicate results to all stakeholders
- Ensure that a well constructed unit is ready for safe operation and transition to the Reactor Oversight Program

Construction Inspection Program

- Early Site Permit inspections
- ITAAC (Inspections, Tests, Analysis and Acceptance Criteria) Inspections
- Non-ITAAC Inspections
- Assessment
- Enforcement
- Quality Assurance
- Vendor Inspection Program

ITAAC/Construction Inspection Program

- Major focus - licensee work being performed to support the completion of the ITAAC.
- Additional inspections of quality assurance verification activities and operational programs will also be needed
- Inspections broken down into four parts:
 - First part supports a licensing decision for an early site permit (ESP)
 - Second part supports a licensing decision on the combined license (COL) application
 - Third part supports a determination on whether construction activities supporting ITAAC have been successfully completed
 - Fourth part supports a determination on whether preparations for plant operation have been successful.

QUESTIONS??