



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Then and Now – and Where to?

New Reactor Licensing from a Regulator's Perspective

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Historical 2-Step Licensing Process

- Construction Permit (CP) issued after mandatory hearing based on evaluation of site and *preliminary* design
- Operating License (OL) issued after hearing opportunity on adequacy of detailed design, quality of construction, and adequacy of proposed operational programs
- This approach was not compelled by the Atomic Energy Act but was sustained when challenged in the US Supreme Court. *PRDC v. Electricians*, 367 US 376 (1961).



2-Step Licensing: what were the problems (perceived or real)?

- Construction occurs *before* NRC's review and approval of detailed design/engineering.
- Lack of standardization due to the “design as you go” approach.
- Stability of applicable regulatory requirements.
- Environmental review at both licensing stages.
- Safety of the same design could be repeatedly challenged site by site – limited finality.
- Emergency planning was essentially an issue at the operating license stage.
- Possibility of hearings at both stages.



Establishing a “New” Licensing Process

- Even in the early 1970’s, approaches to standardization and licensing reform were debated and first steps were taken.
- After the Three Mile Island Accident, the Kemeny Commission, NRC Special Inquiry Group and US Office of Technology Assessment urged licensing reforms.
- Commission publishes draft legislation for comment in 1982 as recommended by its Regulatory Reform Task Force.
- Bills introduced 1983, 1985, & 1987, but no legislation is passed.
- NRC states in its Nuclear Power Plant Standardization Policy (1987) that it will pursue legislation and develop its own regulations.
- Proposed Part 52 is issued in August 1988 providing for design certifications, early site permits and combined licenses.
- Final rule issued in 1989 and sustained by DC Circuit Court of Appeals sitting en banc.
- Energy Policy Act of 1992 codified significant aspects of Part 52.



“Fixing” the Process – NRC Objectives in 10 CFR Part 52:

- Early resolution of issues
- Issue finality and regulatory stability
- Standardization of nuclear power reactor designs
- Meaningful public participation prior to issuing a combined license (COL)



Part 52: Three new regulatory vehicles to achieve the NRC's objectives

- Early approval of potential nuclear power plant sites through early site permit (ESP).
- Early approval, via design certification rulemaking (DCR), of a standardized nuclear power reactor design which may be used at multiple sites.
- Single combined license (COL) authorizing construction and operation, and which may reference ESP and/or DCR.



NRC's "Build-Out" of Reactor Licensing Infrastructure

- **Development and optimization efforts began in early 2000s Continuous Process**
- **Significant activities completed:**
 - Updating of Standard Review Plan (SRP)
 - Issuance of Regulatory Guide (RG) on Form and Content of Combined License
 - Goals for completion of technical reviews for ESPs, DCRs, COLs
 - Design-Centered Working Group (DCWG)
 - Part 52 "lessons learned" rulemaking (2007)
 - Rulemaking redefining "construction" and optimizing limited work authorizations (LWA) process



NRC's "Build-Out" of Reactor Licensing Infrastructure (continued)

- **Licensing infrastructure ongoing activities:**
 - Rulemaking on ITAAC "maintenance"
 - Development of document templates for DCR rulemaking
 - Technical infrastructure for reactors also has been undergoing updating in anticipation of new reactor licensing
 - Fitness for duty for construction activities (Part 26)
 - Overall Improvements to Security Requirements in Part 73
 - Includes cyber-security rule (10 CFR 73.54)
 - Aircraft Impact Assessment Rule (10 CFR 50.150)
 - Updating of RGs providing technical guidance



Improvements to the Hearing Process

- Substantial revisions to hearing procedures in 10 C.F.R. Part 2 adopted in 2004.
- Less-formal hearing procedures for reactor licensing.
- Hearing schedules and model milestones.
- Commission Policy Statement on conduct of hearings for combined licenses.



How successful has Part 52 been able to achieve the NRC's objectives?

The NRC Has issued four Design Certification Rules

- U.S. Advanced Boiling Water Reactor (ABWR) (1997)
- System 80+ (1997)
- AP600 (2000)
- AP1000 (2006)



However ...

COL applicants are referencing designs that are not certified:

- Five COL applicants are referencing docketed designs that are not certified.
- Seven COL applicants are referencing a certified design where the design vendor has proposed major revisions to the design which are currently under review.
- One COL applicant is referencing a certified design. However that applicant is using an alternate vendor to supply the design, rather than the vendor who certified the design. This applicant has also proposed an amendment to the design to address the Commission's new aircraft impact rule.



Consequence of designs not being certified

- The COL review schedules are dependent on the design review schedules.
- The Staff cannot issue a license until the design certification is complete.



How successful has Part 52 been able to achieve the NRC's objectives?

NRC has issued 4 Early Site Permits

- ***Clinton ESP Site***
 - Exelon Generation Company, LLC (March 15, 2007)
- ***Grand Gulf ESP Site***
 - System Energy Resources Inc. (April 5, 2007)
- ***North Anna ESP Site***
 - Dominion Nuclear North Anna, LLC (November 27, 2007)
- ***Vogtle ESP Site***
 - Southern Nuclear Operating Company (August 26, 2009)



However...

- Of the 13 active COL's only 2 reference an Early Site Permit.
- Thus, there is no finality on siting and other environmental issues for most of the COL's



The NRC Staff is currently actively reviewing 13 COL applications

Proposed New Reactor(s)	Design	Applicant
Bell Bend Nuclear Power Plant	U.S. EPR	PPL Bell Bend, LLC
Bellefonte Nuclear Station, Units 3 and 4	AP1000	Tennessee Valley Authority (TVA)
Calvert Cliffs, Unit 3	U.S. EPR	Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC
Comanche Peak, Units 3 and 4	US-APWR	Luminant Generation Company, LLC (Luminant)
Fermi, Unit 3	ESBWR	Detroit Edison Company
Levy County, Units 1 and 2	AP1000	Progress Energy Florida, Inc. (PEF)
North Anna, Unit 3	ESBWR	Dominion Virginia Power (Dominion)
Shearon Harris, Units 2 and 3	AP1000	Progress Energy Carolinas, Inc. (PEC)
South Texas Project, Units 3 and 4	ABWR	STP Nuclear Operating Company (STPNOC)
Turkey Point, Units 6 and 7	AP1000	Florida Power and Light Company (FPL)
Virgil C. Summer, Units 2 and 3	AP1000	South Carolina Electric & Gas (SCE&G)
Vogtle, Units 3 and 4	AP1000	Southern Nuclear Operating Company (SNC)
William States Lee III, Units 1 and 2	AP1000	Duke Energy



In response to requests from Applicants the NRC Staff has suspended its review activities on 5 COL applications

Proposed New Reactor(s)	Design	Applicant
Callaway Plant, Unit 2	U.S. EPR	AmerenUE
Grand Gulf, Unit 3	ESBWR	Entergy Operations, Inc. (EOI)
Nine Mile Point, Unit 3	U.S. EPR	Nine Mile Point 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (UniStar)
River Bend Station, Unit 3	ESBWR	Entergy Operations, Inc. (EOI)
Victoria County Station, Units 1 and 2	ESBWR	Exelon Nuclear Texas Holdings, LLC (Exelon)



How Successful is Part 52?

- Part 52 and the design-centered approach have been successful in achieving COL standardization around a selected design with associated resources savings.
- The full potential of Part 52 will not be realized with the first wave of applications. Part 52 allows for the flexibility to submit COLs concurrent with DC applications. We will not see significant leverage of the Part 52 process from the first wave of applications given that applicants have chosen to submit DCs concurrent with COLs.



What about the Hearing Process?

- 8 of the 13 COL's under active review are contested.
- One hearing request is pending before the Board.
- One application has not yet been noticed for hearing.
- 3 applications had initial hearing requests, which were denied by the licensing board. One of those denials is pending on appeal before the Commission.

What about the Hearing Process?

- **Most of the issues in the contested hearings relate to either:**
 - Long term storage of low level waste in the absence of an available disposal facility; or
 - The adequacy of the NEPA analysis.
- **Two aspects of the hearing process are subject to further development:**
 - Conduct of the “mandatory” hearing.
 - Process for the ITAAC hearing before operation.



Looking forward ...

- The fundamentals are sound.
- We should take the opportunity to learn from the experience with the first COL applications.
- Experience with license renewal shows that further process improvements and efficiencies may be achieved.



References

- **Burns, *Looking Backward, Moving Forward: Licensing New Reactors in the United States*, Nuclear Law Bulletin No. 81 (Vol. 2008/1, June 2008)(published by OECD Nuclear Energy Agency)**
- **NRC Web page – New Reactors: <http://www.nrc.gov/reactors/new-reactor-licensing.html>**
- **Atomic Energy Act of 1954, as amended, § § 185 & 189, 42 U.S.C. § § 2235 & 2239**
- **Energy Policy Act of 1992, Pub. L. 102-486, 106 Stat. 2776**
- **Energy Policy Act of 2005, Pub. L. 109-58, 119 Stat. 594**
- **Nuclear Power Plant Standardization Policy, 52 FR 34884 (Sept. 15, 1987)**
- **Conduct of New Reactor Licensing Proceedings, 73 FR 20963 (Apr. 17, 2008)**
- **10 CFR Part 2, Appendix B (model hearing schedules)**
- **10 CFR Part 52 -- New Reactor Licensing Framework:
 - Proposed Rule, 53 FR 32069 (Aug 23, 1988)
 - Final Rule, 54 FR 15372 (Apr. 18, 1989)
 - Changes to conform to EAct '92, 57 FR 60975 (Dec. 23, 1992)
 - Final revisions, 72 FR 49352 (Aug. 28, 2007)
 - Limited Work Authorizations, 72 FR 57416 (Oct. 9, 2007)
 - Consideration of Aircraft Impacts for New Nuclear Power Reactor Designs, 74 FR 28112 (June 12, 2009)**
- **Nuclear Information & Resource Service v. NRC, 969 F.2d 1169 (D.C. Cir. 1991), *vacating* 918 F.2d 189 (1990) (Part 52 upheld on judicial review).**
- **PRDC v. Electricians, 367 US 376 (1961).**