UTILIZATION OF NRC MANUFACTURING LICENSE FOR SMALL MODULAR REACTORS

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1.0 INTRODUCTION

If the governing U.S. Nuclear Regulatory Commission (NRC) regulations are revised, an NRC Manufacturing License (ML) under 10 C FR 52 (Ref. 1) may be considered as a viable option for licensing future small modular reactors. The purpose of this paper is to examine the challenges with the current licensing process and set forth an alternate, potentially streamlined approach that could result in significant licensing efficiencies for both the NRC as well the industry in certain situations. This paper will summarize issues such as ML interaction with Early Site Permits (ESPs), combined construction permits (CPs) and Operations Licenses (OLs). This paper will also discuss environmental reviews, transport, export control, and intellectual property (IP) protection. Finally, areas such as quality assurance; foreign ownership, control, and influence (FOCI); duration shelf life; transferability; hearings; Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC); and other factors that could affect the decision to pursue an ML are also documented in detail in this paper's tables and appendices.

In sum, this paper makes the following general recommendations:

1. The ML, with or without a standard design approval, should enable small modular reactor vendors to file one application that approves the reactor design, as alternate to a Design Certification (DC), and permits manufacture and transport of the reactor to a licensed site anywhere in the U.S., with separate export licenses required for export overseas. (Tables 1, 2,

and 3 illustrate and compare the attributes of an ML with a DCD. Appendices A and B provide additional detail. For the application of new GEN III NPPs, most if not all, applicants have utilized the DCD for the large reactors planned for construction within the United States. Increased interest in use of the ML is likely for those vendors who plan to export small modular reactors to other countries.)

2. All environmental, site, construction, operation, and export issues would be addressed in connection with applications submitted by the small modular reactor customer, which may reference in their respective applications a design approved for manufacture under the modified ML regulations. Alternately, the manufacturer can pursue such licensing on a common basis with transfer to qualified owners and operators.

2.0 BACKGROUND

A new class of small modular reactors has been specifically designed to meet the electrical power, water, hydrogen, and heat needs. In general, small modular reactors differ from current-generation Light Water Reactors (LWRs) in many ways: size, moderator, coolant, fuel design, projected operation parameters, etc. These new reactors feature longer refueling intervals and simplified operations. Sized in the 10- to 50-MW(electric) range (very small) and up to the 300-MW(electric) range (small to medium), these reactors are built through modularized factory production and designed for rapid site deployment and assembly. The anticipated fuel source is <20% ^{235}U uranium fuel with a nominal core life of 10+ years**.** Many small modular reactors have been designed to operate as multiunit integrated facilities with as many as 4 to 16 small modular reactors operating in unison.

Small modular reactors also differ commercially from the current generation of LWRs. Small modular reactors are factory built and may be fabricated entirely off-site. The fabricated reactors will be shipped to a site for installation, which may include locations overseas. As commercialization proceeds, small modular reactor vendors may intend to fabricate small modular reactors without advanced long-term orders for installation. As such, advanced site licensing with environmental reviews may not be viable.

At the onset of the small modular reactor market, a clear understanding of the licensing process is needed to assist small modular reactor manufacturers as they proceed with the design, engineering, and manufacture of small modular reactor systems, structures, and components. Past consideration/use of the ML provision was not common. The NRC's only experience with reviewing and issuing an ML occurred in the early 1980s (i.e., Offshore Power Systems' ML-1 for the Floating Nuclear Power Plant, issued in 1982). 10 CFR 52, Subpart F (Ref. 2), was not fully updated in 2007 when the NRC issued revisions to its streamlined power reactor licensing process including updating the DC and combined OL regulations to reflect lessons learned from initial licensing reviews. An ML could be a vital element of a small modular reactor vendor's technical/business plans and strategy in this endeavor. Successful development of the small modular reactor industry in the United States may turn on whether a clear licensing framework exists, perhaps utilizing the ML.

3.0 PROBLEM/ISSUE STATEMENT

Revisions to the NRC licensing process culminated in 2007 with capturing lessons learned in validating the licensing process under 10 CFR 52 using single-step licensing of the combined CP and OL, generally in conjunction with a DC. Similar validation and updating of the ML process under 10 CFR 52, Subpart F,

has not been done. The ML process offers an alternative that can enhance the commercial viability of small modular reactor designs in some circumstances. Absent an ML, small modular reactor vendors do not have a clear method to license the manufacture of small modular reactors with formal NRC involvement. By thoroughly understanding the key elements of the ML, a small modular reactor vendor and related stakeholders will have clear information and a defined path for obtaining an ML if this is determined to be the most feasible path forward. This is a decision that should be made early in the program/project lifecycle.

The following key issues with the current ML licensing process under 10 CFR 52, Subpart F, should be addressed:

- The ML need not approve the design of the reactor and may rely on a separate application being submitted for a DC [10 CFR 52, Subpart B (Ref. 3)]) or Standard Design Approval (SDA) (10 CFR 52, Subpart D (Ref. 4)], Because either a DC or SDA can be referenced by a qualified applicant, it affords less control to the small modular reactor vendor and may offer less intellectual property protection as the public interest in the basis for a DC or SDA may be higher [10 CFR 2.390(b)(5) (Ref. 5)].

- ML licensees may only transport manufactured reactors to licensed sites with either a CP or combined OL [10 CFR 52.153(a) (Ref. 6)].

- The ML regulation does not explicitly reflect interaction with 10 CFR 110 (Ref. 7) or 10 CFR 810 (Ref. 8), export regulations to permit shipping to non-U.S. locations.

Appropriate modifications to 10 CFR 52, Subpart F, will clarify the licensing process and bolster the development of the small modular reactor industry. An ML can potentially enable vendors to set up facilities to manufacture and sell small modular reactors without the necessity/undue burden of final site characterization prior to manufacture. NRC approval for siting and construction will be the responsibility of the ultimate customer upon its submission of either an ESP, CP, and/or Combined Construction Operating License Application (COLA). Furthermore, an ML in lieu of a DC or SDA may provide additional control for a licensee compared to a SDA holder or DC applicant. In the case of fabrication of small modular reactors for overseas utilization, NRC's oversight will shift from siting and environmental issues to verifying ITAAC prior to export. Modifications to the ML may also address issues associated with export restrictions under 10 CFR 110 (requirements for export and import of nuclear equipment and material) and the U.S. Department of Energy's (DOE's) 10 CFR 810 (requirements for assistance to foreign atomic energy activities).

These issues are explored below in more detail.

4.0 DISCUSSION

The ML regulations under 10 CFR 52, Subpart F, currently evaluate (1) the final design of a manufactured reactor, (2) the organization and technical control to be exercised for designing and manufacturing the reactor, (3) the ITAAC to be used by the licensee in determining whether the reactor has been properly manufactured in accordance with NRC requirements and the ML, and (4) the possession (but not the transport to or use of a reactor plant site) of the manufactured reactor. The ML does not approve any

specific location, building, or facility where the actual manufacture of the reactor may occur, and the NRC does not require the applicant to submit any information on these matters as part of its application.

Key provisions of the 10 CFR 52 Series (Ref. 1) outline the limitations of the ML as applied to U.S. nuclear power plant installation and limitations for export consideration:

1. *Design Approval—10 CFR 52.157 (Ref. 9) (Content of Applications; Technical Information)*: "The application must contain a final safety analysis report containing the information set forth below, with a level of design information sufficient to enable the Commission to judge the applicant's proposed means of assuring that the manufacturing conforms to the design and to reach a final conclusion on all safety questions associated with the design, permit the preparation of construction and installation specifications by an applicant who seeks to use the manufactured reactor, and permit the preparation of acceptance and inspection requirements by the NRC." As such, the streamlined ML process may include the following elements.

   An ML application may, but need not, reference a DC or an SDA. A DC allows any qualified vendors to supply the design [10 CFR 52.73(a) (Ref. 10)]. While the requirement for a combined OL applicant that references an SDA, but not a DC, is less explicit, it is reasonable to assume the qualification requirements are similar [see 10 CFR 52.79(a)(32) (Ref. 11)]. In contrast, only a licensee may manufacture the design under the ML.

   The required contents of the ML application and the required technical information described in 10 CFR 52.157 closely follow those required under 10 CFR 52.137 (Ref. 12) for SDAs and those under 10 CFR 52.47 (Ref. 13) for Standard Design Certification. (Table 1 shows how closely 10 CFR 52.157 and 10 CFR 52.47 track each other.)

   Any revisions to the existing ML regulation addressing license content should assure that the responsibility of addressing site-specific issues, including environmental issues, remain with the ultimate customer. 10 CFR 52.158(b) (Ref. 14) requires the ML application to contain a generic environmental report while 10 CFR 51.54 (Ref. 15) directs the applicant to include in the site-specific environmental report an analysis of severe accident mitigation design alternatives (SAMDAs). In lieu of requiring an environmental analysis as part of the ML, it may desirable to make such a review optional at the discretion of the vendor.

   If a SAMDA analysis is not performed as part of an ML review, it would be consideration as part of the Severe Accident Mitigation Alternatives (SAMA) analysis during site-specific review. (SAMDA analysis is a subset of the SAMA analysis. If performed as part of a DC review, the conclusions from a SAMDA analysis are given preclusive effect in the site-specific SAMA analysis, assuming the site parameters are bounded by those assumed in the DC SAMDA analysis. See, for example, 10 CFR 52, Appendix D, Sec. VI.B.7 (Ref. 18).) Reactor vendors may find it acceptable to conduct the SAMDA analysis during the site-specific SAMA analysis. Any risk insights that would be derived from a SAMDA analysis would be derived from the Probabilistic Risk Assessment (PRA) required as part of the ML application. For a reactor vendor that expects there is a low accident risk presented by its small modular reactor, no design changes not already evaluated by the PRA are likely to be cost-effective. The SAMDA analysis part of the licensing of advanced reactors to date shows the insights from the PRA are adequate and no additional considerations come from the SAMDA analysis. Also, if an ML is being used for export, incorporating risk insights from the PRA is likely adequate. (For example, the latest draft

International Atomic Energy Agency (IAEA) standard on reactor design incorporates consideration of severe accident alternatives into the safety review, not a separate environmental review. Safety of Nuclear Power Plants: Design, IAEA Safety Requirement NS-R-1, Sec. 5.31 (2000 review draft). An ML should be addressed by regulatory changes to make SAMDA analysis as part of the ML review optional, but the requirement for a PRA should remain unchanged.

2. *Transportation to Installations Within the United States*: 10 CFR 52.167(c)(1) (Ref. 16) (Issuance of Manufacturing License): "A holder of a manufacturing license may not transport or allow to be removed from the place of manufacture the manufactured reactor except to the site of a licensee with either a construction permit under part 50 of this chapter or a combined license under subpart C of this part."

   The CP or combined OL authorizes the construction of a nuclear power facility using the manufactured reactor(s). An approved ML should permit transport of the reactors within the United States to the final destination but does not permit installation at the final location or operation. As it stands, although procedures for transportation to a plant site must be submitted as part of the ML process per 10 CFR 52.157(26)(iv), the actual transportation to a plant site is prohibited under 10 CFR 52.153(a) and 10 CFR 52.167(c) unless there exists either a CP or a combined OL for the site.

   As discussed above, the responsibility for all site-specific construction or environmental issues should be borne by the ultimate customer. The ML application contents should also either include requirements for shipping or reference the appropriate sections of 10 CFR 71 (Ref. 17). This requirement will be very difficult to establish if small modular reactor vendors seek to transport reactors containing fuel. Shipping cask requirements are stringent and may handicap the proposed streamlined ML framework.

3. *Considering Small Modular Reactors to Sites Outside the United States*: What is not evident within the 10 CFR 52 Series (Ref. 1) is any mention of or determination regarding export to other world locations; therefore, some form of integrated application of the applicable 10 CFR 110 (Ref. 7) and 10 CFR 810 (Ref. 8) rules is needed in combination with the ML in order for a small modular reactor vendor to export U.S. technology and materiel properly.

   Specifically, the ML does not authorize export. A reactor manufactured by a licensee may not be exported unless the ultimate customer meets all U.S. law and regulatory export requirements, including 10 CFR 110 and 10 CFR 810. However, export changes to 10 CFR 110 permitting a more streamlined export permit procedure in relation to equipment and materials approved under an ML may be appropriate. There could be a need for necessary and parallel exemptions to ensure continuity of first launch client sales, design/engineering, and delivery while the appropriate statutory rulemaking proceeds—this appears to be acceptable to the NRC.

4. *Intellectual Property Protection*: The issue of IP protection is of critical importance to all nuclear power plant (NPP) technology vendors. Each vendor will go to great lengths to protect its investment in its product by means of a combination of patents, trademarks, and retaining expertise in-house and via contractual agreements. Recent DOE/NRC work since the 1990s has resulted in a very serious risk/concern for most small modular reactor vendors regarding IP protection, as there are limitations on the exclusive use provisions after a Design Certification

Document (DCD) is granted in the public domain. The NRC may grant access to proprietary information or trade secrets, if the public interest outweighs the economic value. For small modular reactor vendors where the IP in the small modular reactor design is most, if not almost all, of the company's value, the risk of NRC release of the proprietary information can be a serious impediment to such small modular reactor vendors raising equity capital.

Relying on the NRC to apply current regulations in 10 CFR 2.390 to withhold proprietary information from public disclosure has historically proven adequate for protecting the interests of larger, more diversified, reactor vendors. Where the DC applicant or SDA holder is a smaller, specialized small modular reactor vendor, larger competing, diversified vendors may view demonstrating technical qualifications equivalent to the DC applicant or SDA holder is not a significant economic barrier. An important objective of this paper is the identification of methods to more effectively assure reliable small modular reactor development via more robust IP protection schemes [whether in 10 CFR 52 or 10 CFR 2 (Ref. 19)] for small modular reactor vendors or, as a minimum, to identify the pitfalls/limitations of the current scheme.

The General Electric (GE) Advanced Boiling Water Reactor (ABWR) development evolution provides an example of the risk to IP associated with the use of the DCD. The following is an excerpt from the Ref. 20 discussion on the same topic: "The original General Electric design has been certified, but any plant built from that design would face the need for modifications . . . . [although] The certified design also includes exclusive intellectual property of GE Hitachi; [however] South Texas -3 and -4 would use a design in which Toshiba is replacing the GE Hitachi exclusives [via use of the Combined Operations License Application (COLA)] with its own features developed from Toshiba's ABWRs in Asia . . . . GE Hitachi and Toshiba have both notified the NRC that they will seek the renewal of the ABWR certification [in parallel]." The observation can be made, as a result of this type of DCD exploitation and uncertainty, that there is limited or no meaningful protection of a vendor's design using the DCD/rule-making venue against a large, diversified competitor.

On the other hand, the ML would be controlled by the small modular reactor manufacturer as a licensee; therefore, the ML appears to offer desirable protections for the vendor's design though not the duration of DC that the DCD approach offers (fifteen-plus years under DCD versus an effective twelve years under ML. [Further details are shown in 10 CFR 52, Appendix A (Ref. 21); 10 CFR 52.173 (Ref. 22) versus 10 CFR 52.55 (Ref. 23); and in 10 CFR 52, Appendix B (Ref. 24).] Unfortunately, the effectively shorter duration of the ML could potentially increase product costs for more frequent license renewals and thus result in reducing profit margins.

This issue demonstrates the need for coordination with the ESP/COLA provisions currently being utilized by the large Generation (GEN) III NPPs in the United States; perhaps some new protocol is needed for small modular reactors. Combined OL applicants are permitted to reference the ML in the same manner in which SDCs are referenced, as stated in 10 CFR 52.73. In doing so, a customer's combined OL application referencing an ML-approved design must contain information sufficient to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP.

5. *ML Interactions with Other NRC Licenses/Permits*: In order to streamline licensing, the ML should be paired with an OL. 10 CFR 50, Appendix N (Ref. 25) permits applicants to submit an application for license to operate nuclear power reactors of essentially the same design to be

located at different sites. Therefore, the small modular reactor vendor may apply for both the ML as well as an OL. Small modular reactors designed and manufactured by one vendor are essentially the same design but may be located at different sites. Upon successful approval of these two licenses, the small modular reactor vendor would now be able to manufacture the small modular reactor and subsequently sell the reactor with transfer of an approved OL to a qualified owner and operator. Importantly, the ML and OL application process would be completed only once and would not need to be repeated for each reactor manufacture/sale. Prior to shipment to the ultimate customer, the vendor and customer should commence a license transfer under 10 CFR 50.80 (Ref. 26) to transfer the OL to the customer. This license transfer would close out any license conditions related to operational procedures. (It is likely not commercially reasonable for a reactor vendor to demonstrate operational qualifications. Such operational issues would be addressed by license conditions in the OL. Those license conditions could be resolved as part of an amendment proposed with the OL transfer application.) This approach removes the burden of each customer being required to apply for an OL. The license transfer standards [10 CFR 2, Subpart M (Ref. 27)] for approval have proven not to be burdensome and therefore present little administrative burden to slow the process.

As discussed above, the responsibility for all site-specific construction or environmental issues should be borne by the ultimate customer. The customer would need to obtain a CP that demonstrates the site falls within the site parameters assumed in the ML and its paired OL. Alternatively, the customer could pursue a combined OL under 10 CFR 52 and reference the vendor's approved ML, in which case a transfer of the OL from the vendor would not be necessary. Flexibility could be increased if the purchasers were allowed to resolve the site-specific issues with an ESP. Prior to the license transfer, the ultimate customer could prepare his or her site to accept and install the purchased reactor via an approved ESP [10 CFR 52, Subpart A (Ref. 28)] as well as a limited work authorization [10 CFR 52.27 (Ref. 29) and 10 CFR 50.10 (Ref. 30)].

5.0 CONCLUSIONS

1. **Within the United States, the ML currently does not authorize shipment of a small modular reactor-NPP to a site; further licenses such as a combined OL are needed for equipment shipments, construction, and final operation**. The application of ML versus DC is conditional/limited and dependent upon certain business drivers such as speed to market, but the ML could be utilized if the planning cycle allows for proper application and granting of a Standard Combined Operating License Application (S-COLA). Environmental review of an ML should be simple. Currently, a manufacturer can assemble a reactor in a factory with no new Federal environmental review. Similarly, the environmental review associated with an ML should be at the reactor vendor's option as the conclusions from PRA insights can be expected to preclude a SAMDA analysis from identifying any design changes. Therefore, it may be commercially reasonable to conduct a SAMDA as part of the site-specific SAMA analysis; in fact, it may not even be needed based on the low risk expected to be demonstrated by the PRA that could show severe accidents are too remote and speculative to warrant considering severe accidents in the environmental review of that small modular reactor design.

2. **Outside the United States, the ML appears to offer an excellent vehicle to enable proper and well-controlled export of U.S. technology and expertise**. This issue is of substantial importance to small modular reactor-NPP vendors who have business models that depend upon significant

global sales/export. However, there must be extensive coordination with other U.S. export provisions to authorize proper delivery. For purposes of this discussion we assume that NPP shipments outside the United States will be allowed (with export permits) to a foreign site that may not have approval for NPP construction/operation. An export license should be able to be combined with an ML in a seamless fashion and cover all Federal export controls, not only from the NRC but also from the DOE, and the U.S. Departments of Commerce, Treasury, and State.

3. **Manufacturing licenses may provide superior IP protection—with a trade-off of shorter duration and need for further development of rigor/reliability**. This IP protection aspect could be very attractive when combined with other IP protections such as trademarks and patents to help ensure that widespread application of small modular reactors is economically feasible both within the United States and worldwide. An ML should allow a manufacturer higher assurance of maintaining control of its design. Unlike a DC or SDA, which can be referenced by any qualified applicant, a small modular reactor vendor with an ML will solely enjoy the benefits of referencing a standardized design with marginally greater competitive certainty. Much effort remains to properly define protocol and useful precedent that would provide adequate assurance/certainty to small modular reactor vendors and properly defend their business case if the ML were chosen versus the DCD.

6.0 RECOMMENDATIONS

1. **Additional regulatory guidance is needed**. The NRC should clarify the means to cooperate with the DOE and U.S. Departments of Commerce, Defense, Treasury, and State perhaps resulting in a new Regulatory Guide (RG) that combines the aspects of 10 CFR 110 (export of material) and (DOE) 10 CFR 810 (export of technology) rules, given the increased interest in exporting small modular reactor technology globally. A good interim solution would also be development of a related task force to develop a Nuclear Energy Institute (NEI)–style guideline that could more efficiently evolve into an NRC RG. This approach enables thorough review and update of priorities with respect to relevant documentation.

2. **Design Centered Working Group (DCWG)–style collaboration should examine relevant federal precedent(s).** A new American Nuclear Society (ANS)–sponsored DCWG should further investigate other analogous industries (e.g., aircraft and weapons) that manufacture and export high-technology equipment for precedents, in parallel with further study. The DCWG could also be an NEI Working Group. A DCWG would enhance visibility and establish accountability of NEI members, including utilities. The ANS can continue to plan or initially set up the DCWG, but there are limits as to what can be accomplished with volunteer support.

3. **Use DCWG Forum to optimize certification pathway(s).** A post-June 2010 ANS-sponsored Technical Working Group/DCWG should further examine the ML for small modular reactor designs. This evaluation should include a critical integrated review of viable alternate certification and approval pathways, including DCs, MLs, combined OLs, SDAs, CPs, and common (10 CFR 52, Appendix N) OLs.

4. **Consider a parallel certification path; near-term exemptions/waivers along with rule changes.** The NRC should establish a parallel path whereby near-term exemptions or waivers can be granted for small modular reactor lead-launch clients while in pursuit of rule change process

improvements. The small modular reactor industry should pursue a petition for rulemaking to provide additional flexibility and certainty to the ML process for small modular reactor projects. Such revisions will enhance the effectiveness of standardization by better matching the ML process to the commercial/business needs of small modular reactors manufactured and assembled for delivery, essentially ready to use at a prepared site.

5. **Enhance ML IP protective features.** Because of the potential heavy risk associated with IP for small modular reactors, the ML process needs to be reexamined to ensure that no loopholes or weaknesses exist that would place the small modular reactors at undue deleterious risk during the development and implementation process. Furthermore, the use of a task force approach (as outlined in Section 6.1 above) could significantly enhance the effectiveness and outcome of the process.

7.0 REFERENCES

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3. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Subpart B, "Standard Design Certifications,"U.S. Nuclear Regulatory Commission.

4. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Subpart D, "[Reserved],"U.S. Nuclear Regulatory Commission.

5. C*ode of Federal Regulations*, Title 10, "Energy,"Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," Sec. 2.390, "Public Inspections, Exemptions, Requests for Withholding," U.S. Nuclear Regulatory Commission.

6. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.153, "Relationship to Other Subparts," U.S. Nuclear Regulatory Commission.

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8. C*ode of Federal Regulations*, Title 10, "Energy," Part 810, "Assistance to Foreign Atomic Energy Activities," U.S. Department of Energy.

9. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.157, "Contents of Applications; Technical Information in Final Safety Analysis Report," U.S. Nuclear Regulatory Commission.

10. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.73, "Relationship to Other Subparts," U.S. Nuclear Regulatory Commission.

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15. C*ode of Federal Regulations*, Title 10, "Energy," Part 51 "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," Sec. 51.54, "Environmental Report—Manufacturing License," Nuclear Regulatory Commission.

16. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.167, "Issuance of Manufacturing License," U.S. Nuclear Regulatory Commission.

17. C*ode of Federal Regulations*, Title 10, "Energy," Part 71, "Packaging and Transportation of Radioactive Material," U.S. Nuclear Regulatory Commission.

18. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Appendix D, "Design Certification Rule for the AP1000 Design," U.S. Nuclear Regulatory Commission.

19. C*ode of Federal Regulations*, Title 10, "Energy, "Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," U.S. Nuclear Regulatory Commission.

20. "Design Certification, ABWR," *Nuclear News*, p. 27 (Apr. 2010).

21. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor," U.S. Nuclear Regulatory Commission.

22. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.173, "Duration of Manufacturing License," U.S. Nuclear Regulatory Commission.

23. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.55, "Duration of Certification," U.S. Nuclear Regulatory Commission.

24. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Appendix B, "Design Certification Rule for the System 80+ Design," U.S. Nuclear Regulatory Commission.

25. C*ode of Federal Regulations*, Title 10, "Energy," Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix N, "Standardization of Nuclear Power Plant Designs: Permits to Construct and Licenses to Operate Nuclear Power Reactors of Identical Origin at Multiple Sites," U.S. Nuclear Regulatory Commission.

26. C*ode of Federal Regulations*, Title 10, "Energy," Part 50, "Domestic Licensing of Production and Utilization Facilities," Sec. 50.80. "Transfer of Licenses," U.S. Nuclear Regulatory Commission.

27. C*ode of Federal Regulations*, Title 10, "Energy, "Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," Subpart M, "Proceedings for Hearings on License Transfer Applications," U.S. Nuclear Regulatory Commission

28. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Subpart A, "Early Site Permits," U.S. Nuclear Regulatory Commission.

29. C*ode of Federal Regulations*, Title 10, "Energy," Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Sec. 52.27, "Limited Work Authorization After Issuance of Early Site Permit," U.S. Nuclear Regulatory Commission.

30. C*ode of Federal Regulations*, Title 10, "Energy," Part 50, "Domestic Licensing of Production and Utilization Facilities," Sec. 50.10, "License Required; Limited Work Authorization," U.S Nuclear Regulatory Commission.

Table 1 Identical or Essentially Identical Submittal Requirements Comparison between Manufacturing License and Design Control Certification		
Summary of Requirement in 10 CFR 52	**Subpart F: ML Paragraph Ref**	**Subpart B: DCD Paragraph Ref**
FSAR must include:	157	47(a)
Principal Design Criteria	157(a)	47(a)(3)(i)
Design Bases & relation to Principal Design Criteria	157(b)	47(a)(3)(ii)
Description & analysis of Structures, Systems, Components (SCCs):	157(c)	47(a)(2)
Intended use	157(c)(1)	47(a)(2)(i)
Extent generally accepted eng practices are applied	157(c)(2)	47(a)(2)(ii)
Extent reactor uses enhanced safety features	157(c)(3)	47(a)(2)(iii)
Safety features as barriers to radiological release:	157(d)	47(a)(2)(iv)
Evaluation at exclusionary area boundary	157(d)(1)	47(a)(2)(iv)(A)
Evaluation at outer boundary of Low Population Zone	157(d)(2)	47(a)(2)(iv)(B)
Kinds & quantities of radiological materials; means to control & limit	157(e)	47(a)(5)
Information to establish design complies with technical req'ts:	157(f)	
Analysis & evaluation of design & performance of SCCs	157(f)(1)	47(a)(4)
Fire protection	157(f)(2)	47(a)(18)
Pressurized thermal shock	157(f)(3)	47(a)(14)
Combustible gas control	157(f)(4)	47(a)(12)
Station blackout	157(f)(5)	47(a)(16)
Electrical equipment important to safety	157(f)(6)	47(a)(13)
Anticipated transients without scram	157(f)(7)	47(a)(15)
Criticality accidents	157(f)(8)	47(a)(17)
Information required by §20.1406 (minimize contamination)	157(f)(9)	47(a)(6)
Control over gaseous & Liquid radiological effluents	157(f)(11)	47(a)(10)
Three Mile Island requirements	157(f)(12)	47(a)(8)
Compliance with earthquake engineering criteria	157(f)(14)	47(a)(20)
Demonstrate new safety features by test, analysis or prototype	157(f)(15)	47(c)(2)
Technical qualification of applicant	157(f)(16)	47(a)(7)
Description of quality assurance program	157(f)(17)	47(a)(19)
Proposed technical specifications	157(f)(18)	47(a)(11)
Site parameters & analysis & evaluation of design	157(f)(19)	47(a)(1)
Interface requirements between reactor and rest of plant	157(f)(20)	47(a)(25)
Interface req'ts to be verified by inspections, tests, or analysis	157(f)(21)	47(a)(26)
Representative conceptual design for nuclear power facility	157(f)(22)	47(a)(24)
For LWRs, description & analysis vs. severe accidents	157(f)(23)	47(a)(23)
For modular designs, possible operation configurations	157(f)(25)	47(c)(3)
Resolutions of Unresolved Safety Issues & generic safety issues	157(f)(28)	47(a)(21)
How operating experience has been incorporated	157(f)(29)	47(a)(22)
For LWRs, evaluation of design vs. NRC Standard Review Plan	157(f)(30)	47(a)(9)
Design-specific probabilistic risk assessment	157(f)(31)	47(a)(27)
Aircraft impact assessment per §50.150	157(f)(32)	47(a)(28)
Inspections, tests, analyses, and acceptance criteria (ITAAC)	158(a)	47(b)(1)
Environmental report per §51.54 or §51.55	158(b)	47(b)(2)

Table 2 Other Identical or Essentially Identical Requirements Comparison between Manufacturing License and Design Control Certification		
Summary of Requirement in 10 CFR 52	**Subpart F: ML Paragraph Ref**	**Subpart B: DCD Paragraph Ref**
Standards for review of application	159	48
Referral to Advisory Committee on Reactor Safeguards (ACRS)	165	53
Issuance of manufacturing license / standard design certification:	167	54
Applicable standards are met, reasonable assurance for compliance	167(a)(1), (2)	54(a) (1), (3)
Applicant is technically qualified	167(a) (4)	54(a) (4)
ITAAC are necessary & sufficient	167(a) (5)	54(a) (5)
Issuance not inimical to common defense or public's health & safety	167(a) (6)	54(a) (6)
Findings per §51 subpart A have been made	167(a) (7)	54(a) (7)
Site parameters & design characteristics are specified	167(b)(3)	54(b)
Finality of License / Certification:	171	63
Limitations on NRC imposing new requirements	171(a)(1)	63(a)(1)
NRC imposed modifications apply to all reactors	171(a)(2)	63(a)(3)
Other applicant may request departure / exemption	171(b)(2)	63(b)(1)
Criteria for renewal	179	59

Table 3 Potentially Significant Differences in Requirements between Manufacturing License (ML) and Design Certification Document (DCD)		
Topic	**ML Requirement**	**DCD Requirement**
FILING OF APPLICATION		
Who may apply ML: §52.155(a) & §50.38	Citizen, national, or agent of a foreign country or corporation owned, controlled by a foreign corporation is ineligible to apply.	No restriction on foreign ownership or control
CONTENT OF APPLICATION		
Risk-informed evaluation of SCCs ML: §52.157(f)(13)	If applicant uses risk-informed treatment of SCCs per §50.69, must submit information per §50.69(b)(2)	Risk-informed treatment of SCCs not explicitly mentioned
Management Plan ML: §52.157(f)(26)	Detailed Management Plan must be submitted	Management Plan not explicitly mentioned
Shipping Procedures ML: §52.157(f)(26)(iv)	Procedures for shipping must be submitted	Shipping procedures not mentioned
ADMINISTRATIVE REVIEW OF APPLICATIONS		
Hearing Procedures ML: §52.163; DCD: §52.51	Hearing requirements reference 10 CFR part 2, subparts C, G, L and N	Hearing requirements reference 10 CFR part 2, subpart O
ISSUANCE OF LICENSE / CERTIFICATION		
Implementation of QA Program DCD: §52.54(a)(8)	QA Program implementation not explicitly mentioned	Certification states applicant has implemented QA program
Shipment of reactor components to non-licensed site ML: §52.167(c)(1)	Manufactured reactor may not be transported from place of manufacture except to a site with either construction permit or combined license	Multiple provisions allow shipment to but not installation at a yet-to-be licensed site
DURATION OF LICENSE / CERTIFICATION		
Limitation near expiration of duration ML: §52.173; DCD: §52.55(a)	Valid for not less than 5 years or more than 15 years. Reactor manufacture may not start within 3 years of expiration until license is renewed	Valid for 15 years. No limitation on starting manufacture before expiration
Limitation on completing manufacturing ML: §52.173; DCD: §52.55(b)	Manufacture of any uncompleted reactor must cease upon license expiration, unless renewal application has been docketed	Certification remains valid after expiration for any docketed COL or OL application
TRANSFER OF LICENSE		
Transfer of License or DCD ML: §52.175	Manufacturing license may be transferred per §50.80	No provision given for transfer of Certification
License Ownership NRC Workshop, 2/3/10	"license is owned by a single entity"	"Certification can be used by any qualified entity"
APPLICATION FOR RENEWAL		
Hearings during renewal process ML: §52.177; DCD §52.57(a)	Allowance for a hearing on the application for renewal is explicitly stated	Commission appears to have discretion to hold hearings

Appendix A
Exact Wording of Differences in Manufacturing License vs. Design Certification Document

Manufacturing License -- 10 CFR 52 Subpart F (§52.151 - §52.181)	Standard Design Certification--10 CFR 52 Subpart B (§52.41 - §52.63)
§52.151 Scope of Subpart This subpart sets out the requirements and procedures applicable to Commission issuance of a license authorizing manufacture of nuclear power reactors to be installed at sites not identified in the manufacturing license application.	§52.41 Scope of Subpart (a) This subpart sets forth the requirements and procedures applicable to Commission issuance of rules granting standard design certifications for nuclear power facilities separate from the filing of an application for a construction permit or combined license for such a facility. (b)(1) Any person may seek a standard design certification for an essentially complete nuclear power plant design which is an evolutionary change from light water reactor designs of plants which have been licensed and in commercial operation before April 18, 1989. (2) Any person may also seek a standard design certification for a nuclear power plant design which differs significantly from the light water reactor designs described in paragraph (b)(1) of this section or uses simplified, inherent, passive, or other innovative means to accomplish its safety functions.
§52.155 Filing of Applications (a) Any person, except one excluded by 10 CFR 50.38, may file an application for a manufacturing license under this subpart with the Director of New Reactors or the Director of Nuclear Reactor Regulation, as appropriate. (b) The application must comply with the applicable filing requirements of §52.3 and 50.30 of this chapter. **Ref: § 50.38 Ineligibility of certain applicants.** Any person who is a citizen, national, or agent of a foreign country, or any corporation, or other entity which the Commission knows or has reason to believe is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government, shall be ineligible to apply for and obtain a license.	§52.45 Filing of Applications (a) An application for design certification may be filed notwithstanding the fact that an application for a construction permit, combined license, or manufacturing license for such a facility has not been filed. (b) The application must comply with the applicable filing requirements of §52.3 and §2.811 through 2.819 of this chapter.
§52.157 Content of Applications; Technical Information (c) A description and analysis of the structures, systems, and components of the reactor to be manufactured, with emphasis upon the materials of manufacture, performance requirements, the bases, with technical justification therefore,	§52.47 Content of Applications; Technical Information (a)(2) A description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification therefore, upon which these requirements have been

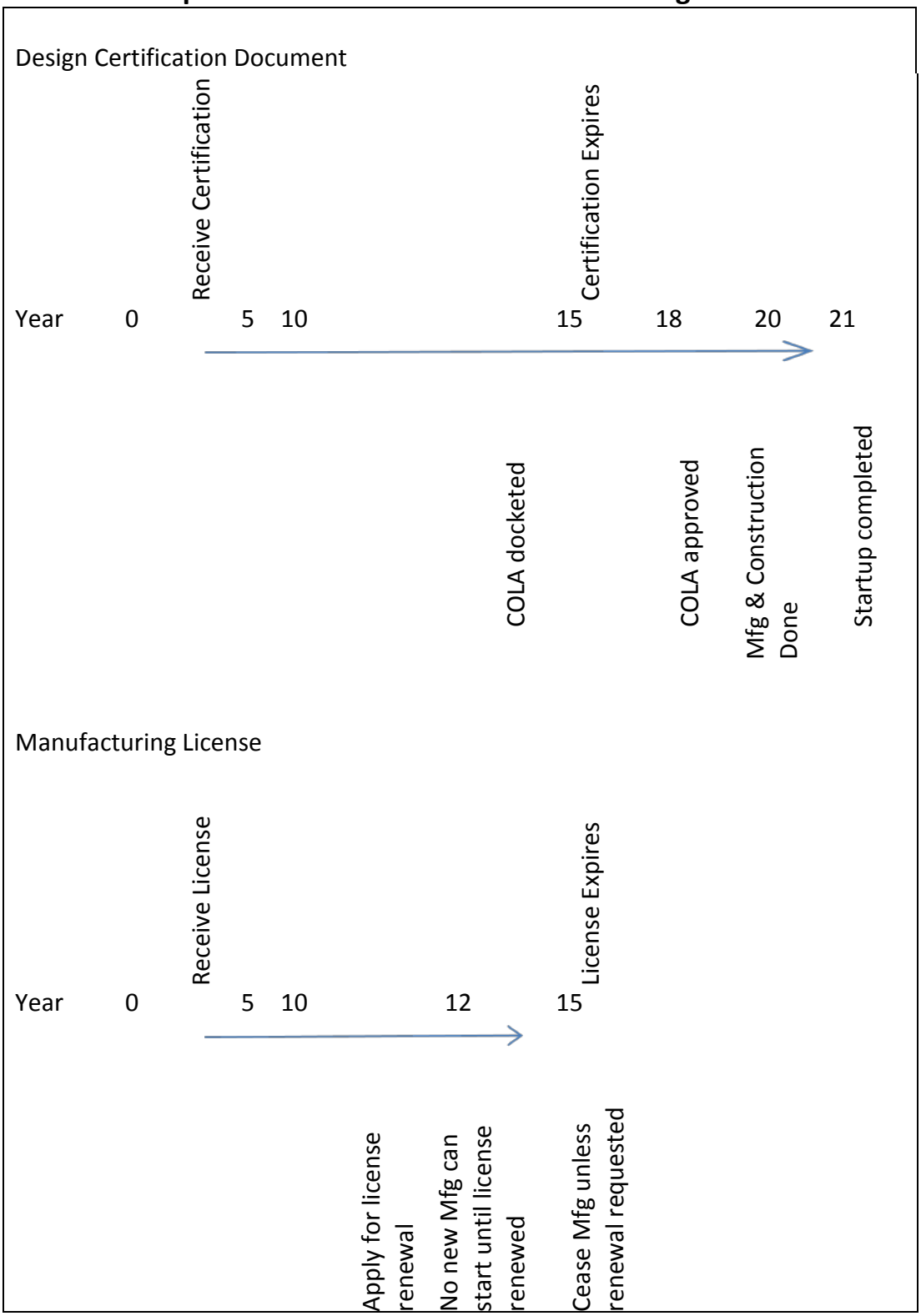
upon which the performance requirements have been established, and the evaluations required to show that safety functions will be accomplished.	established, and the evaluations required to show that safety functions will be accomplished.
	§52.47 Content of Applications; Technical Information (a)(3)(iii) Information relative to materials of construction, general arrangement, and approximate dimensions, sufficient to provide reasonable assurance that the design will conform to the design bases with an adequate margin for safety;
§52.157 Content of Applications; Technical Information (f)(13) If the applicant seeks to use risk-informed treatment of SSCs in accordance with § 50.69 of this chapter, the information required by § 50.69(b)(2) of this chapter	
§52.157 Content of Applications; Technical Information (f)(26) A description of the management plan for design and manufacturing activities, including: (i) The organizational and management structure singularly responsible for direction of design and manufacture of the reactor; (ii) Technical resources directed by the applicant, and the qualifications requirements; (iii) Details of the interaction of design and manufacture within the applicant's organization and the manner by which the applicant will ensure close integration of the architect engineer and the nuclear steam supply vendor, as applicable; (iv) Proposed procedures governing the preparation of the manufactured reactor for shipping to the site where it is to be operated, the conduct of shipping, and verifying the condition of the manufactured reactor upon receipt at the site; and (v) The degree of top level management oversight and technical control to be exercised by the applicant during design and manufacture, including the preparation and implementation of procedures necessary to guide the effort;	
§52.157 Content of Applications; Technical Information (f)(27) Necessary parameters to be used in developing plans for preoperational testing and initial operation	
	§52.47 Content of Applications; Technical Information (c) This paragraph applies, according to its provisions, to particular applications: (1) An application for certification of a nuclear power reactor design that is an evolutionary change from light-water reactor designs of plants that have been licensed and in commercial operation before April 18, 1989, must provide an

	essentially complete nuclear power plant design except for site-specific elements such as the service water intake structure and the ultimate heat sink; (2) An application for certification of a nuclear power reactor design that differs significantly from the light-water reactor designs described in paragraph (c)(1) of this section or uses simplified, inherent, passive, or other innovative means to accomplish its safety functions must provide an essentially complete nuclear power reactor design except for site-specific elements such as the service water intake structure and the ultimate heat sink, and must meet the requirements of 10 CFR 50.43(e)
§52.163 Administrative Review of Applications A proceeding on a manufacturing license is subject to all applicable procedural requirements contained in 10 CFR part 2, including the requirements for docketing in § 2.101(a)(1) through (4) of this chapter, and the requirements for issuance of a notice of proposed action in §2.105 of this chapter, *provided, however*, that the designated sections may not be construed to require that the environmental report or draft or final environmental impact statement include an assessment of the benefits of constructing and/or operating the manufactured reactor or an evaluation of alternative energy sources. All hearings on manufacturing licenses are governed by the hearing procedures contained in 10 CFR part 2, subparts C, G, L, and N.	§52.51 Administrative Review of Applications (a) A standard design certification is a rule that will be issued in accordance with the provisions of subpart H of 10 CFR part 2, as supplemented by the provisions of this section. The Commission shall initiate the rulemaking after an application has been filed under §52.45 and shall specify the procedures to be used for the rulemaking. The notice of proposed rulemaking published in the **Federal Register** must provide an opportunity for the submission of comments on the proposed design certification rule. If, at the time a proposed design certification rule is published in the **Federal Register** under this paragraph (a), the Commission decides that a legislative hearing should be held, the information required by 10 CFR 2.1502(c) must be included in the **Federal Register** document for the proposed design certification. (b) Following the submission of comments on the proposed design certification rule, the Commission may, at its discretion, hold a legislative hearing under the procedures in subpart O of part 2 of this chapter. The Commission shall publish a document in the **Federal Register** of its decision to hold a legislative hearing. The document shall contain the information specified in paragraph (c) of this section, and specify whether the Commission or a presiding officer will conduct the legislative hearing. (c) Notwithstanding anything in 10 CFR 2.390 to the contrary, proprietary information will be protected in the same manner and to the same extent as proprietary information submitted in connection with applications for licenses, provided that the design certification shall be published in Chapter I of this title.
§52.167 Issuance of Manufacturing License (a) After completing any hearing under § 52.163, and receiving the report submitted by the ACRS, the Commission may issue a manufacturing license if the Commission finds that:	§52.54 Issuance of Standard Design Certification (a) After conducting a rulemaking proceeding under § 52.51 on an application for a standard design certification and receiving the report to be submitted by the Advisory Committee on Reactor Safeguards under § 52.53, the Commission may

(2) There is reasonable assurance that the reactor(s) will be manufactured, and can be transported, incorporated into a nuclear power plant, and operated in conformity with the manufacturing license, the provision of the Act, and the Commission's regulations; (3) The proposed reactor(s) can be incorporated into a nuclear power plant and operated at sites having characteristics that fall within the site parameters postulated for the design of the manufactured reactor(s) without undue risk to the health and safety of the public; (b) Each manufacturing license issued under this subpart shall specify: (1) Terms and conditions as the Commission deems necessary and appropriate; (2) Technical specifications for operation of the manufactured reactor, as the Commission deems necessary and appropriate; (3) Site parameters and design characteristics for the manufactured reactor; and (4) The interface requirements to be met by the site-specific elements of the facility, such as the service water intake structure and the ultimate heat sink, not within the scope of the manufactured reactor. (c)(1) A holder of a manufacturing license may not transport or allow to be removed from the place of manufacture the manufactured reactor except to the site of a licensee with either a construction permit under part 50 of this chapter or a combined license under subpart C of this part. The construction permit or combined license must authorize the construction of a nuclear power facility using the manufactured reactor(s). (2) A holder of a manufacturing license shall include, in any contract governing the transport of a manufactured reactor from the place of manufacture to any other location, a provision requiring that the person or entity transporting the manufactured reactor to comply with all NRC-approved shipping requirements in the manufacturing license.	issue a standard design certification in the form of a rule for the design which is the subject of the application, if the Commission determines that: (2) Notifications, if any, to other agencies or bodies have been duly made; (3) There is reasonable assurance that the standard design conforms with the provisions of the Act, and the Commission's regulations; (8) The applicant has implemented the quality assurance program described or referenced in the safety analysis report. (b) The design certification rule must specify the site parameters, design characteristics, and any additional requirements and restrictions of the design certification rule. (c) After the Commission has adopted a final design certification rule, the applicant shall not permit any individual to have access to or any facility to possess restricted data or classified National Security Information until the individual and/or facility has been approved for access under the provisions of 10 CFR parts 25 and/or 95, as applicable.
§52.171 Finality of Manufacturing License (3) In making the findings required for issuance of a construction permit, operating license, combined license, in any hearing under § 52.103, or in any enforcement hearing other than one initiated by the Commission under paragraph (a)(1) of this section, for which a nuclear power reactor manufactured under this subpart is referenced or used, the Commission shall treat as resolved those matters resolved in the proceeding on the application for issuance or renewal of the manufacturing license, including the adequacy of	§52.63 Finality of Standard Design Certification a)(1) Notwithstanding any provision in 10 CFR 50.109, while a standard design certification rule is in effect under §§ 52.55 or 52.61, the Commission may not modify, rescind, or impose new requirements on the certification information, whether on its own motion, or in response to a petition from any person, unless the Commission determines in a rulemaking that the change: (iv) Provides the detailed design information to be verified under those inspections, tests, analyses, and acceptance criteria (ITAAC) which are directed at certification

design of the manufactured reactor, the costs and benefits of severe accident mitigation design alternatives, and the bases for not incorporating severe accident mitigation design alternatives into the design of the reactor to be manufactured. (b)(1) The holder of a manufacturing license may not make changes to the design of the nuclear power reactor authorized to be manufactured without prior Commission approval. The request for a change to the design must be in the form of an application for a license amendment, and must meet the requirements of 10 CFR 50.90 and 50.92.	information (*i.e.*, design acceptance criteria); (v) Is necessary to correct material errors in the certification information; (vi) Substantially increases overall safety, reliability, or security of facility design, construction, or operation, and the direct and indirect costs of implementation of the rule change are justified in view of this increased safety, reliability, or security; or (vii) Contributes to increased standardization of the certification information. (2)(i) In a rulemaking under § 52.63(a)(1), except for § 52.63(a)(1)(ii), the Commission will give consideration to whether the benefits justify the costs for plants that are already licensed or for which an application for a permit or license is under consideration. (ii) The rulemaking procedures for changes under § 52.63(a)(1) must provide for notice and opportunity for public comment. (4) The Commission may not impose new requirements by plant-specific order on any part of the design of a specific plant referencing the design certification rule if that part was approved in the design certification while a design certification rule is in effect under § 52.55 or § 52.61, unless: (i) A modification is necessary to secure compliance with the Commission's regulations applicable and in effect at the time the certification was issued, or to assure adequate protection of the public health and safety or the common defense and security; and (ii) Special circumstances as defined in 10 CFR 52.7 are present. In addition to the factors listed in § 52.7, the Commission shall consider whether the special circumstances which § 52.7 requires to be present outweigh any decrease in safety that may result from the reduction in standardization caused by the plant-specific order. (2) Subject to § 50.59 of this chapter, a licensee who references a design certification rule may make departures from the design of the nuclear power facility, without prior Commission approval, unless the proposed departure involves a change to the design as described in the rule certifying the design. The licensee shall maintain records of all departures from the facility and these records must be maintained and available for audit until the date of termination of the license. (c) The Commission will require, before granting a construction permit, combined license, operating license, or manufacturing license which references a design certification rule, that information normally contained in certain procurement

	specifications and construction and installation specifications be completed and available for audit if the information is necessary for the Commission to make its safety determinations, including the determination that the application is consistent with the certification information. This information may be acquired by appropriate arrangements with the design certification applicant.
§52.171 Information Requests (c) Except for information requests seeking to verify compliance with the current licensing basis of either the manufacturing license or the manufactured reactor, information requests to the holder of a manufacturing license or an applicant or licensee using a manufactured reactor must be evaluated before issuance to ensure that the burden to be imposed on respondents is justified in view of the potential safety significance of the issue to be addressed in the requested information. Each evaluation performed by the NRC staff must be in accordance with 10 CFR 50.54(f) and must be approved by the Executive Director for Operations or his or her designee before issuance of the request.	
§52.173 Duration of Manufacturing License A manufacturing license issued under this subpart may be valid for not less than 5, nor more than 15 years from the date of issuance. A holder of a manufacturing license may not initiate the manufacture of a reactor less than 3 years before the expiration of the license even though a timely application for renewal has been docketed with the NRC. Upon expiration of the manufacturing license, the manufacture of any uncompleted reactors must cease unless a timely application for renewal has been docketed with the NRC.	§52.55 Duration of Certification (a) Except as provided in paragraph (b) of this section, a standard design certification issued under this subpart is valid for 15 years from the date of issuance. (b) A standard design certification continues to be valid beyond the date of expiration in any proceeding on an application for a combined license or an operating license that references the standard design certification and is docketed either before the date of expiration of the certification, or, if a timely application for renewal of the certification has been filed, before the Commission has determined whether to renew the certification. A design certification also continues to be valid beyond the date of expiration in any hearing held under § 52.103 before operation begins under a combined license that references the design certification.
§52.175 Transfer of Manufacturing License A manufacturing license may be transferred in accordance with § 50.80 of this chapter.	*No provision for transfer of a DCD* *[§50.80 discusses transfer of licenses, not certifications]*
§52.177 Application for Renewal (a) Not less than 12 months, nor more than 5 years before the expiration of the manufacturing license, or any later renewal period, the holder of the manufacturing license may apply for a renewal of the license. An application for	§52.57 Application for Renewal (a) Not less than 12 nor more than 36 months before the expiration of the initial 15-year period, or any later renewal period, any person may apply for renewal of the certification. An application for renewal must contain all information necessary

renewal must contain all information necessary to bring up to date the information and data contained in the previous application. (b) The filing of an application for a renewed license must be in accordance with subpart A of 10 CFR part 2 and 10 CFR 52.3 and 50.30. (c) A manufacturing license, either original or renewed, for which a timely application for renewal has been filed, remains in effect until the Commission has made a final determination on the renewal application, *provided, however*, that in accordance with § 52.173, the holder of a manufacturing license may not begin manufacture of a reactor less than 3 years before the expiration of the license. (d) Any person whose interest may be affected by renewal of the permit may request a hearing on the application for renewal. The request for a hearing must comply with 10 CFR 2.309. If a hearing is granted, notice of the hearing will be published in accordance with 10 CFR 2.104.	to bring up to date the information and data contained in the previous application. The Commission will require, before renewal of certification, that information normally contained in certain procurement specifications and construction and installation specifications be completed and available for audit if this information is necessary for the Commission to make its safety determination. Notice and comment procedures must be used for a rulemaking proceeding on the application for renewal. The Commission, in its discretion, may require the use of additional procedures in individual renewal proceedings. (b) A design certification, either original or renewed, for which a timely application for renewal has been filed remains in effect until the Commission has determined whether to renew the certification. If the certification is not renewed, it continues to be valid in certain proceedings, in accordance with the provisions of § 52.55.
§52.171 Finality of Manufacturing License (b)(1) The holder of a manufacturing license may not make changes to the design of the nuclear power reactor authorized to be manufactured without prior Commission approval. The request for a change to the design must be in the form of an application for a license amendment, and must meet the requirements of 10 CFR 50.90 and 50.92.	§52.59 Criteria for Renewal (c) In addition, the applicant for renewal may request an amendment to the design certification. The Commission shall grant the amendment request if it determines that the amendment will comply with the Atomic Energy Act and the Commission's regulations in effect at the time of renewal. If the amendment request entails such an extensive change to the design certification that an essentially new standard design is being p*roposed*, an application for a design certification must be filed in accordance with this subpart. (d) Denial of renewal does not bar the applicant, or another applicant, from filing a new application for certification of the design, which proposes design changes that correct the deficiencies cited in the denial of the renewal.
§52.181 Duration of Renewal A renewed manufacturing license may be issued for a term of not less than 5, nor more than 15 years, plus any remaining years on the manufacturing license then in effect before renewal. The renewed license shall be subject to the requirements of §§ 52.171 and 52.175.	§52.61 Duration of Renewal Each renewal of certification for a standard design will be for not less than 10, nor more than 15 years.

Appendix B
Sample Timeline for DCD vs. Manufacturing License