

§ 52.24 have been met by the combined license holder, although this is implicit by the inclusion of any terms and conditions in the early site permit. To remove any ambiguity in this matter, the Commission is proposing to include a proposed § 52.211(a)(1)(iii) by requiring the application to address whether the terms and conditions specified in the early site permit under § 52.24 have been met (the Commission also proposes to rearrange paragraph (a)(1) by dividing the criteria to be met by an application referencing an early site permit into separate subdivisions (i), (ii), and (iii)). The Commission's intent, as reflected in the words, "have been met," is that all terms and conditions will be met prior to issuance of the combined license.

Testing Requirements for Advanced Reactors

The proposed rule would amend the current § 52.79(b) (proposed § 52.211(b)) to revise the requirements for combined license applications that do not reference a design certification rule by adding the current § 52.47(b)(2) (proposed § 52.107(b)(2)) to the list of requirements in the proposed § 52.211(b)(1) that a combined license applicant must comply with. This amendment will provide consistency between the current advanced reactor testing requirements in subpart B of part 52 (§ 52.47(b)(2)) and the proposed testing requirements in the proposed subpart G of part 52 (§ 52.211(b)). This amendment will require a combined license applicant that references a custom advanced reactor design to also perform the design qualification testing required by the current § 52.47(b)(2) for design certification applicants. If a combined license application references a certified advanced reactor design, the qualification testing required by § 52.47(b)(2) will have been performed. The amendment also requires (proposed § 52.211(b)(3)) that if a licensed prototype plant (see definition in proposed § 52.3) is used to meet the qualification testing requirements in the current § 52.47(b)(2), additional requirements on siting, safety features, or operational conditions may be required for licensing, in order to compensate for uncertainties associated with the performance of new or innovative safety features in the prototype plant.

The codification of testing requirements in the current § 52.47(b)(2) was a principal issue in the development of 10 CFR part 52 (see Section II of 54 FR 15372; April 18, 1989). The testing requirements in § 52.47(b)(2), to demonstrate the

performance of safety features for nuclear power plants that differ significantly from evolutionary light-water reactors or utilize simplified, inherent, passive, or other innovative means to accomplish their safety functions (advanced reactors), were included in 10 CFR part 52 to ensure that these safety features will perform as predicted in the applicant's safety analysis report, that the effects of systems interactions are acceptable, and to provide sufficient data to validate analytical codes. The design qualification testing requirements may be met with either separate effects or integral system tests; prototype tests; or a combination of tests, analyses, and operating experience. These requirements implement the Commission's policy on proof-of-performance testing for all advanced reactors (see 51 FR 24643; July 8, 1986) and the Commission's goal of resolving all design issues before authorizing construction.

During the development of 10 CFR part 52, the focus of the nuclear industry and the NRC staff was on applications for design certification. That is why the testing requirements to qualify new or innovative safety features was only included in subpart B of 10 CFR part 52, "Standard Design Certifications." The tests to qualify a design feature are different than verification tests, which are required by § 52.79(c) and performed in accordance with section XI, "Test Control," of Appendix B to 10 CFR part 50. Verification tests are used to provide assurance that construction and installation of equipment (as-built) in the facility has been accomplished in accordance with the approved design.

Exelon Generation and NEI commented on the addition of testing requirements for combined license applications, in letters dated November 13, 2001. NEI stated:

COL application requirements in § 52.79(b)(1) have been modified to include a reference to the design certification application requirements of § 52.47(b)(2)(i). Under this proposal, an applicant seeking a COL for a non-certified design that differs significantly from typical light water reactors would have to demonstrate safety feature performance through either (A) analysis, testing, or experience, or (B) full-scale prototype testing. This requirement is entirely appropriate for design certification applicants. However, as discussed below, we believe it is unnecessary to apply these requirements to COL applicants, and that the potential requirement for full-scale prototype testing is particularly inappropriate.

First, part 52 should not be modified to open the door to requiring a COL applicant, who does not reference a certified design, to

build and complete testing of a full-scale prototype before the granting of the license. The potential to require prototype testing to support issuance of a COL is contrary to Commission guidance in the part 52 Statements of Consideration. The Commission clearly recognized "licensing the prototype for commercial operation" as a path open to applicants under subpart C of part 52 that could lessen the burden of having to demonstrate innovative designs through full scale prototype testing. We agree with the further statement by the Commission that, "[i]t is well to remember also that, under the rule, prototype testing is required only for certification or an unconditional design approval, if at all." * * * In sum, through its existing requirements and regulatory authority, the NRC is assured of (1) Adequate information to support required COL reviews and safety determinations, and (2) satisfactory demonstration of innovative design features during startup and power ascension testing. The proposed new COL application requirements are unnecessary and should not be carried forward into the part 52 NOPR (Notice of Proposed Rulemaking).

The Commission disagrees with NEI and Exelon regarding the need to perform qualification testing for new or innovative safety features in all advanced reactor designs. The Commission reformed the licensing process for new nuclear plants with the issuance of 10 CFR part 52 in 1989 and required applicants to demonstrate that safety features will perform as predicted in their final safety analysis report. Although the focus of the NRC staff in 1989 was on applications for design certification, the Commission intended that testing to qualify design features (proof-of-performance testing) would be required for all advanced reactors, including custom designs (see Question 6 at 51 FR 24646; July 8, 1986). Furthermore, it would make no sense for the Commission to require testing for design certification (paper designs) and not require testing for applications to build and operate an actual advanced nuclear reactor.

Although the Commission has stated that it favors the use of prototypical demonstration facilities and that prototype testing is likely to be required for certification of advanced non-light-water designs (see policy at 51 FR 24646; July 8, 1986 and Section II of 54 FR 15372 on 10 CFR part 52; April 18, 1989), the proposed rule does not mandate the use of a prototype plant. Rather, the proposed rule provides that if a prototype plant is used to qualify an advanced reactor design, then additional requirements may be required for licensing of the prototype to compensate for any uncertainties with the unproven safety features. Also, the prototype plant could be used for