POLICY ISSUE
(Negative Consent)

November 20, 2001 SECY-01-0207

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations

SUBJECT: LEGAL AND FINANCIAL ISSUES RELATED TO EXELON'S PEBBLE BED MODULAR REACTOR (PBMR)

PURPOSE:

To inform the Commission of preliminary staff positions related to the staff's assessment of the Exelon Generation (Exelon) proposals on legal and financial issues and additional staff-identified licensing-related issues that may affect the Exelon application. Staff also requests Commission approval, by negative consent, to publish the preliminary staff positions so that the staff can engage stakeholders on these preliminary positions prior to providing the Commission with policy recommendations in June 2002.

BACKGROUND:

Exelon is considering pursuing a combined license (COL) and a design certification for the Pebble Bed Modular Reactor (PBMR) design pursuant to 10 CFR Part 52. The PBMR is a set of modular, high temperature, helium-cooled reactors. Each PBMR module contains its own reactor and power conversion system and produces 100 – 140 MWe. Exelon defines a PBMR "facility" as up to 10 reactors or modules operated from one control room. Exelon plans to operate the PBMR as a merchant plant. Merchant plants are owned and operated by independent power producers and generate electricity expressly for sale on the open, wholesale electricity market at market price.

DISCUSSION:

In a letter dated December 5, 2000, Exelon expressed interest in pre-application activities. The staff began its pre-application review at a meeting with Exelon on April 30, 2001. As a part of the meeting, Exelon discussed legal and financial issues that Exelon believes merit special
consideration due to the unique features of the modular facility, the gas-cooled reactor

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design and Exelon's intention to operate the PBMR as a merchant plant. By a letter dated May 10, 2001 (ML011420393), Exelon submitted nine white papers on these legal and financial issues and requested an agency response. The nine white papers addressed requirements associated with:

- operator staffing
- fuel cycle impacts
- financial qualifications
- decommissioning funding
- minimum decommissioning costs
- antitrust review
- number of licenses
- annual fees
- financial protection

Exelon is currently performing a detailed feasibility study of the licensability of the PBMR. If the results are favorable, Exelon intends to seek a license to operate a PBMR facility as a merchant power plant in the United States. Exelon believes that the white papers identify regulations that could pose undue and unintended burden when applied to gas-cooled reactors, modular facilities, or merchant plants. Exelon believes that certain regulations were not intended for and do not contemplate gas-cooled modular facilities operated as merchant plants. The staff's assessment of Exelon's proposals is attached. Exelon plans to use the assessment in its feasibility study on whether to proceed with licensing in the United States. Exelon will make the decision in 2002.

In addition to addressing the white paper proposals, the staff identified related issues to Exelon's proposals that may affect the PBMR application. The following issues are discussed in the attachment:

- license life for one combined license for multiple reactors
- duration of design approval under a combined license for multiple reactors
- commencement of annual fees
- testing of new design features for a combined license

<u>SUMMARY</u>:

This paper presents preliminary staff positions related to the staff's assessment of the Exelon's proposals on legal and financial issues and additional staff-identified licensing-related issues that may affect the Exelon application. These issues are discussed in detail in the attachment.

The staff's positions are as follows:

1. Operator staffing in 10 CFR 50.54(m)

The regulations do not address the possibility of having three or more reactors controlled from one control room. The staff agrees with Exelon that Exelon will need to address the safety implications to justify that more than two reactors can be adequately controlled from one control room. Further, an exemption to the regulations would be necessary for an alternate level of operator staffing for the PBMR. In its application, Exelon must provide adequate justification for the proposed staffing level.

2. Fuel cycle impacts: Tables S3 and S4 in 10 CFR 51.51 and 51.52

For other-than-light-water-reactor applicants, the staff must review on an application-by-application basis design-specific environmental impacts, because current Tables S-3 and S-4 do not cover PBMR fuel design and fuel cycle considerations. The impacts should be discussed in a manner similar to that presented in 10 CFR 51.51 and 51.52. The fuel cycle and fuel transportation impacts for non-light-water reactors (LWRs) could differ from the impacts codified in 10 CFR Part 51; absent a rule, these impacts will have to be addressed in each application.

3. Fuel cycle impacts: Waste Confidence in 10 CFR 51.23

It appears that a PBMR facility would be within the scope of the generic determination in Section 51.23(a). With respect to the Department of Energy's (DOE's) acceptance of PBMR spent nuclear fuel, Exelon should enter into discussions with DOE, as appropriate, to confirm that DOE will accept PBMR fuel.

4. Financial qualifications in 10 CFR 50.33(f)

The Commission has the authority to determine by regulation that a given class of non-electric utility applicants for nuclear power plant licenses shall not be required to submit financial qualifications information. However, Exelon has not yet presented sufficient technical and regulatory information to support the establishment of such a class of applicants, nor has the staff identified a reasonable basis for establishing such a class of applicants.

For the first PBMR application, Exelon must submit estimates for the total construction costs and annual operating costs for each of the first 5 years of operation of the entire PBMR facility and identify the source of funds to cover such operating costs, as required by Appendix C of Part 50. Exelon's submittal will be reviewed by the staff using the process provided in the Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance (NUREG-1577, Rev. 1, March 1999).

5. Decommissioning funding requirements in 10 CFR 50.75

Exelon proposes to seek a license as a nonutility. This will, according to current NRC regulations, provide Exelon with several options for funding decommissioning, but not the sinking fund option. Exelon's proposed payment scheme, which is a form of a sinking fund, would not provide the same assurance of adequate decommissioning funding as the other options available to Exelon, and would be difficult to justify.

6. Minimum decommissioning cost estimates in 10 CFR 50.75(c)

The staff will accept a minimum decommissioning cost estimate specifically for the PBMR if the NRC finds the technical justification to be adequate.

7. Antitrust review requirements in 10 CFR 50.33a

The ability of the NRC to except certain applicants for new nuclear generating facilities from the NRC's antitrust review requirements is being addressed separately by the Office of the General Counsel.

8. Number of licenses and license duration for one combined license (COL) for multiple reactors in 10 CFR Part 52

Congress did not specifically address the prospect of combining individual COLs for multiple reactor modules into a single combined COL. Nevertheless, there appears to be nothing in the legislative history of the Atomic Energy Act (AEA) which explicitly precludes the possibility that the Commission may, under the authority of Section 161.h. of the AEA, combine into a single license the individual Part 52 COLs for reactor modules of a substantially similar design co-located at a single site. If the Commission considers this course, it should also consider rulemaking to clarify: (i) the nature of "reactor modules" and modular designs whose licensing may be combined under the authority of Section 161.h. of the AEA and (ii) the process for making findings under 10 CFR 52.103(g) for reactor modules (and possibly the process for NRC staff inspection and publication of notices concerning completed inspections, tests, analyses and acceptance criteria (ITAAC) in 10 CFR 52.99).

The terms of operation for a single combined COL would be limited to 40 years from the date of issuance of the COL. Sequential 40-year terms for each reactor module are not possible inasmuch as a "single license" would be issued. Legislation recently submitted by the Commission addressing the matter of 40-year terms would, if enacted, permit the 40-year term of operation to begin when the Commission made the initial 10 CFR 52.103(g) finding, but would not permit sequential 40-year terms.

The staff has a concern with the effective duration of a design approval resulting from a multiple module license issued under 10 CFR Part 52. Therefore, if a single combined license is issued for multiple modules (nuclear reactors), then the license should be conditioned so that the design can be reviewed every 5 years without the constraints of the backfit requirement in 10 CFR 50.109.

9. Annual fee requirements in 10 CFR Part 171 and commencement of annual fees in 10 CFR Part 52

The Chief Financial Officer (CFO) plans to include, in the FY 2002 fee rulemaking, revisions to Part 171 that would specifically authorize annual fees to be charged to facilities licensed under Part 52; clarify that the NRC annual fee is charged per license, not per unit; and establish when NRC will begin to charge an annual fee to a holder of a Part 52 combined license. Until a final decision is made on the number of modules that will be allowed under a single license, and the NRC receives sufficient information from Exelon to enable it to determine what kind of regulatory oversight the proposed design will likely require, no staff recommendations on establishing a new license fee category for modular reactors will be offered.

For a Part 52 combined license, the staff plans to assess the annual fee only after construction has been completed, all regulatory requirements have been met, and the Commission has authorized operation of the reactor(s).

10. Financial protection requirements in 10 CFR Part 140

The Commission has stated its position, in letters to Congress, on the application of Price-Anderson financial protection requirements to multiple modular reactor units co-located at a single site. The Commission stated, in part, that it "believes there are substantial doubts whether it has authority to treat multiple reactor units as only one facility for purposes of the retrospective assessment because the specific financial protection and retrospective assessment provisions in Section 170b. of the AEA are specified for a 'facility', elsewhere defined as a single reactor or even an important component part of a reactor. In our view, Congress should amend the AEA if it seeks to assure that multiple modular units at a single site are treated as a single facility."

11. Testing of new design features

The NRC has initiated rulemaking to update 10 CFR Part 52 and will request public comment on its proposed revisions to Part 52. In the current draft rulemaking language that was made available on the NRC's rulemaking web site, the NRC staff proposed to revise Subpart C of Part 52 to make it consistent with Subpart B of Part 52 and the original intent of Part 52. Thus, if approved, revised Part 52 would require that all testing determined to be necessary to demonstrate that new design features will perform as predicted in the final safety analysis be completed before issuance of the COL. A recommendation on this issue will be made after review of public comments provided in response to the proposed Part 52 rule change.

RECOMMENDATION:

The staff intends to engage Exelon and other stakeholders on the positions presented in this paper and receive their feedback. Stakeholder interactions will include a workshop in early 2002. Based on these pre-application interactions, the staff will amend its positions, as necessary, and make recommendations on policy issues related to the legal and financial issues for Commission approval. The staff will provide policy recommendations in June 2002. Staff requests action within 10 days. Action will not be taken until the SRM is received. We consider this action to be within the delegated authority of the EDO.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has concurred in this paper.

/RA/

William D. Travers
Executive Director
for Operations

Attachment: Staff Assessment of Exelon's Legal and Financial White Papers

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COORDINATION:
The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has concurred in this paper.

William D. Travers ***/RA/***
Executive Director
for Operations

Attachment: Staff Assessment of Exelon's Legal and Financial White Papers
*See previous concurrence Accession # ML012850139

OFC	PM:NRLPO*	PM:NRLPO*	Tech Ed*	(A)DD:NRLPO*	D:NRLPO*
NAME	DJackson:cn	ACubbage	PKleene	MGamberoni	JLyons
DATE	10/4/01	10/12/01	10/9/01	10/4/01	10/12/01

OFC	BC:RGEB*	D:DRIP*	NRR*	OGC*	OCFO*
NAME	CCarpenter	DMatthews	WBorchardt	KCyr-MJO for JEM	JFunches
DATE	10/12/01	10/12/01	11/6/01	10/26/01	10/23/01

OFC	RES*	NMSS*	DEDR	EDO	
NAME	AThadani	MVirgilio	WKane	WTravers	
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Staff Assessment of Exelon's Legal and Financial White Papers

As part of the pre-application review, Exelon Generation (Exelon) has submitted nine white papers on selected legal and financial issues for Commission response. Exelon is currently performing a detailed feasibility study of the Pebble Bed Modular Reactor (PBMR). If the results are favorable, Exelon intends to seek a license to operate a PBMR facility as a merchant power plant in the United States. Exelon has identified several regulations that could pose undue and unintended burden when applied to gas-cooled reactors, modular facilities, or merchant plants. Exelon believes that certain regulations were not designed for and do not contemplate gas-cooled, modular facilities operated as merchant plants. Exelon will use the staff's assessment of these white papers in its feasibility study. In addition to addressing the proposals by Exelon, the staff identifies other issues related to Exelon's proposals that may affect the PBMR application (Items H.2, H.3, I.2 and K). The following issues and regulations are addressed in this assessment:

A. Operator staffing requirements in 10 CFR 50.54(m)
B. Fuel cycle impacts: Tables S3 and S4 in 10 CFR 51.51 and 51.52
C. Fuel cycle impacts: Waste Confidence Rule in 10 CFR 51.23
D. Financial qualifications in 10 CFR 50.33(f)
E. Decommissioning funding requirements in 10 CFR 50.75
F. Minimum decommissioning cost estimates in 10 CFR 50.75(c)
G. Antitrust review requirements in 10 CFR 50.33a
H. License issues:
    1. Number of licenses
    2. License duration of one combined license for multiple reactors
    3. Duration of design approval under a combined license for multiple reactors
I. Annual fee issues:
    1. Annual fee requirements in 10 CFR Part 171
    2. Commencement of annual fee in 10 CFR Part 52
J. Financial protection requirements in 10 CFR Part 140
K. Testing of new design features for a combined license

The detailed discussions of these issues on the following pages summarize the issues, the current regulations, Exelon's position, the staff's considerations, and the staff's preliminary positions.

Attachment

A. Operator Staffing

Issue

Should a PBMR facility be allowed to control more than two reactors from one control room and
operate with a control room staffing complement that is less than would be required for individual reactors?

Current Regulations

The NRC has established the requirements for control room staffing in 10 CFR 50.54(k) and (m). The first section, 10 CFR 50.54(k), states: "An operator or senior operator licensed pursuant to Part 55 of this chapter shall be present at the controls at all times during the operation of the facility."

Three sections of 10 CFR 50.54(m) relate to this operator staffing issue. The first is 10 CFR 50.54(m)(2)(i), which states: "Each licensee shall meet the minimum licensed operator staffing requirements in the following table." The table includes one, two and three nuclear units; one, two, and three control rooms; and gives the minimum number of operators and senior operators for each applicable combination, but does not address more than two units per control room.

The second related section is 10 CFR 50.54(m)(2)(iii), which states: "When a nuclear power unit is in an operational mode other than cold shutdown or refueling, as defined by the unit's technical specifications, each licensee shall have a person holding a senior operator license for the nuclear power unit in the control room at all times. In addition to this senior operator, for each fueled nuclear power unit, a licensed operator or senior operator shall be present at the controls at all times."

The third related section is 10 CFR 50.54(m)(2)(iv), which states: "Each licensee shall have present, during alteration of the core of a nuclear power unit (including fuel loading and transfer), a person holding a senior operator license or a senior operator license limited to fuel handling to directly supervise the activity and, during this time, the licensee shall not assign other duties to this person."

In addition, NUREG-0800, Standard Review Plan 13.1.2, Section II.B.3, states that staffing should follow the staff positions of Items I.A.1.1 and I.A.1.3 of the TMI Action Plan (NUREG-0737):

a. A shift supervisor with a senior reactor operator's license, who is also a member of the station supervisory staff, shall be on site at all times when at least one unit is loaded with fuel.

b. In addition to the licensed personnel specified in 10 CFR 50.54(m), as a minimum, an auxiliary operator (nonlicensed) shall be assigned to each reactor and an additional auxiliary operator shall be assigned for each control room for an operating reactor.

TMI Action Plan Item I.A.1.1 also discusses the need for engineering expertise on shift in the position of a shift technical advisor.

Exelon's Position

The proposed PBMR has multiple reactors (up to 10) controlled from one control room. Each reactor has its own power conversion system. Exelon has not yet determined the number of operators required to operate multiple reactors from one control room. However, Exelon believes that since the PBMR is a passive plant and does not require early operator intervention to mitigate accidents, the staffing level should be less than that indicated in 10 CFR 50.54(m) for one or two units.

The regulation does not contain any staffing requirements for more than two units at a site with a common control room. Exelon proposes to justify the licensed operator staffing requirements for three or more PBMR modules at a site with a common control room.

Exelon proposes to request an exemption from the minimum staffing requirements and location of the senior reactor operators and other reactor operators required in 10 CFR 50.54(m). Additionally, Exelon will request exemptions from 10 CFR 50.54(m) in the design certification to avoid duplicate reviews for subsequent PBMRs.

Discussion

To allow an alternate level of operator staffing, an exemption from the regulation would need to be justified. If an alternate level is proposed by an applicant, adequate justification based on the safety implications must be provided. For the PBMR, the staff has identified a number of issues that Exelon will need to address in justifying an alternate operator staffing level in an application. The key to justification of alternate staffing is a detailed function and task analysis, followed by performance demonstrations on a control room simulator or control room prototype of all activities expected of the operators in normal, abnormal, emergency and accident conditions. To accomplish this, Exelon first needs to develop its concept of operations, considering the following, at a minimum:

- Role of the operator — Is the operator to be an active participant in reactor operation or merely a passive monitor or troubleshooter?
- Level of automation — Is the system to be fully automatic, fully manual, or some combination thereof? What degree of automation is desired?
- Modes of operation — What modes of operation will be required of the system (e.g., cold shutdown, hot standby, normal operation, refueling)?
- Multiple module control — What is the goal? How many modules should be controlled per operator or how many operators per module?
- Control room design — What is the control room design concept? How many workstations? For what purpose? What is the individual workstation design concept?
- Refueling during operation — How accomplished? How controlled? By whom?
- Personnel categories and qualifications — Should operators be licensed as they are today or will they need different qualifications (e.g., knowledge of refueling operations, computer expertise)?
- Procedures — Symptom based? Interactive? Computerized or hard copy?

Once the concept of operations is determined, the applicant could follow the Human Factors Engineering Program Review Model described in NUREG-0711. This NUREG was developed during the review of the three certified advanced reactor designs. It was specifically intended

to anticipate advances in instrumentation technology that might occur prior to actual construction of a plant. This is the guidance the staff will use to review the applicant's human factors engineering program. The guidance includes an element on operator staffing.

In its white paper proposal, Exelon did not include 10 CFR 50.54(k) in its list of staffing issues. The staff's issue with 10 CFR 50.54(k) is the interpretation of the phrase "at the controls" as it might relate to one operator controlling multiple reactors in a PBMR. For example, if the operator of a multimodule PBMR is manipulating reactivity in one reactor via digital keyboard and CRT (cathode ray tube [display]), is that operator "at the controls" of other reactors using the same or a spatially different keyboard and CRT? The issue is the precise definition of "at the controls." The staff expects Exelon to address the safety implications of this issue as it affects the PBMR.

The issue related to 10 CFR 50.54(m)(2)(i) is twofold. First, for a plant having only one control room (as opposed to two or three), the Minimum Requirements table considers only up to two nuclear power units controlled from that one control room. Exelon proposes to justify operator staffing requirements for three or more PBMR modules with a common control room. The regulation is silent on the consideration of three or more reactors controlled from one control room, and the staff agrees that a safety justification is necessary. The second issue associated with the table is the number of operators required per unit per control room. Exelon believes it to be excessive, even for the first two PBMR modules, because the passive nature of the plant, which Exelon claims will not require early operator intervention to mitigate accidents. The staff might agree, but Exelon will also have to justify that position. The issue with 10 CFR 50.54(m) (2)(iii) is similar to the issue with 10 CFR 50.54(k) requiring the operator to be "at the controls," but contains an additional requirement in that the provision is "for each fueled nuclear power unit."

The final staffing issue associated with 10 CFR 50.54 relates to 10 CFR 50.54(m)(2)(iv). The issue stems from the last phrase in the requirement: "the licensee shall not assign other duties to this person." If the PBMR has fuel being continuously replenished from the top as used fuel is removed from the bottom, the core is being altered continuously. The staff would expect a senior licensed operator to be in the control room, based on 10 CFR 50.54(m)(2)(iii), but it is not clear whether Exelon would expect the operator to have no other duties than to supervise a continuous refueling operation. The staff expects Exelon to define the duties of the senior licensed operator as they relate to the refueling process and justify its position with regard to safety.

Lastly, the staff believes the staffing-related issues in the Standard Review Plan are applicable to the PBMR and expects Exelon to address them in the application.

Staff Position

The regulations do not address the possibility of having three or more reactors controlled from one control room. The staff agrees with Exelon that they will need to address the safety implications to justify that more than two reactors can be adequately controlled from one control room.

B. Environmental Impacts of the Fuel Cycle and Transportation: 10 CFR Part 51, Tables S-3 and S-4

Issue

Based upon resolution of the environmental impact issues for the first PBMR application, should the NRC initiate rulemaking to create PBMR-specific tables for environmental impacts?

Current Regulations

In accordance with 10 CFR 51.41, 51.45, 51.50, 52.17(a)(2), and 52.79(a)(2), an environmental report prepared by the applicant for a construction permit, early site permit, or combined license should provide sufficient information regarding any applicable environmental impacts associated with all stages of the production and transportation of reactor fuel. However, light-water power reactor applicants are expected to rely on the regulatory framework at 10 CFR 51.51 and 51.52 by including Tables S-3 and S-4 in their environmental report. For other-than-light-water-reactor applicants, the environmental impacts of the production and transportation of fuel must be described in the environmental report in sufficient detail to provide information on the cumulative, environmental, socioeconomic, and human health impacts associated with the fuel cycle and fuel transportation. That information serves as a starting point for the NRC's environmental impact statement (EIS).

Exelon's Position

As part of the first application, Exelon proposes to identify the environmental impacts attributable to the fuel cycle and fuel transportation for a set of modular reactors that constitute a PBMR facility. Exelon suggests that the impacts are expected to be generic for all PBMR nuclear power reactors and therefore, Exelon proposes that the results for the first application should form the underlying bases for rulemaking. Exelon proposes that rulemaking be initiated to create tables similar to 10 CFR Part 51, Tables S-3 and S-4, for the PBMR, or that the issue be generically resolved for the PBMR during a design certification rulemaking.

Discussion

The PBMR is not a light-water power reactor, and therefore the PBMR applicant currently cannot rely upon Tables S-3 and S-4.

The fuel cycle and fuel transportation impacts for non-light-water power reactors could be different from those addressed in 10 CFR Part 51. Absent a rule, each COL and early site permit applicant referencing a PBMR would have to submit information on these impacts. The NRC staff would have to address the impacts in the EIS.

Independent of issues raised by Exelon, the NRC staff has previously identified the need for rulemaking to revise Tables S-3 and S-4 in 10 CFR 51.51 and 51.52. However, the staff believes that any effort to undertake generic rulemaking on PBMR-specific fuel cycle and fuel transportation issues would be premature, inasmuch as the PBMR is still a prospective design.

Exelon's suggestion that the design certification rulemaking for a PBMR serve as a platform for resolving the attendant generic environmental impacts could result in changes to Part 51 that would be too narrowly focused by limiting the changes to a particular technology. For example, the current 10 CFR Part 51 considers light-water power reactors as a class of plants; it does not distinguish between a pressurized-water reactor (PWR), a boiling-water reactor (BWR), and the recently approved designs under Part 52. The PBMR could be considered part of a class of other-than-light-water power reactors (e.g., the gas turbine-modular helium reactor) that present similar challenges and a similar need for a regulatory solution. In addition, different parts of the regulations are involved (i.e., Parts 51 and 52); a change to a generic rule concomitant with a new rule governing a specific design could unnecessarily complicate a design certification rulemaking.

Staff Position

For other-than-light-water-reactor applicants, the staff must review design-specific environmental impacts, in the absence of generic rulemaking, to update Tables S-3 and S-4. The impacts should be discussed in a manner similar to that presented in 10 CFR 51.51 and 51.52; the discussion would serve as a starting point for the NRC independent assessment and should provide sufficiently detailed information on the cumulative, environmental, socioeconomic, and human health impacts of the fuel cycle and fuel transportation. The fuel cycle and fuel transportation impacts for non-light-water power reactors could be different from those addressed in 10 CFR Part 51; absent a rule, these impacts would have to be addressed in each application.

The NRC has only limited experience in licensing other-than-light-water power reactors; at this time all operating power reactors are light-water reactors. Inasmuch as the PBMR is a prospective design, the staff believes that any effort to undertake a generic rulemaking on these issues would be premature. When the staff has gained more experience in the issues associated with the PBMR, or other non-light-water power reactor designs, through a design certification or an adjudicatory proceeding (e.g., combined license), the staff can determine whether it has sufficient information to proceed with a generic regulatory solution.

C. Environmental Impacts of the Fuel Cycle and Transportation: Waste Confidence Rule

Issue

Would PBMR spent fuel fall within the scope of the NRC's Waste Confidence Rule?

Current Regulations

The NRC's Waste Confidence Rule is codified at 10 CFR 51.23. Section 51.23(a) states:

> The Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least thirty years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that

> reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installations. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within thirty years beyond the licensed life for operation of any reactor to dispose of commercial high-level waste and spent fuel originating in such reactor and generated up to that time.

The result of the generic determination in Section 51.23(a) is that there is no need to consider the environmental impacts of the onsite storage of spent fuel (in environmental reports, environmental impact statements, environmental assessments, or other analyses), for the period following the anticipated expiration of the license, in reactor and independent spent fuel storage facility licensing proceedings. However, Section 51.23(c) requires that environmental impacts during the term of the reactor operating license or a license for an independent spent fuel storage installation (ISFSI) be considered in a licensing proceeding.

Exelon's Position

Exelon wants to clarify that long-term onsite storage of spent fuel beyond the licensed lifetime of the PBMR is not a concern under the NRC Waste Confidence Rule codified at 10 CFR 51.23. The Waste Confidence Rule, as revised, reflects the Commission's generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installations. Exelon notes that the Waste Confidence Rule does not distinguish between types of spent fuel. Additionally, in making its findings in support of the Waste Confidence Rule, the Commission explicitly considered non-LWR fuel, including fuel from gas-cooled reactors. Accordingly, Exelon believes that the Waste Confidence Rule is broad enough to encompass fuel irradiated in a gas-cooled reactor like a PBMR. Exelon also maintains that the Department of Energy (DOE), under the Nuclear Waste Policy Act (NWPA), is responsible for disposal of spent nuclear fuel (SNF).

Discussion

The Commission's Waste Confidence Rule, as codified at 10 CFR 51.23, is based on findings contained in the Commission's Waste Confidence Decision (WCD). The Commission issued its initial WCD on August 31, 1984 (49 FR 34658). This decision was intended to provide an assessment of the degree of assurance available that radioactive waste can be safely disposed of, to determine when such disposal or offsite storage would be available, and to determine whether radioactive waste can be safely stored on site past the expiration of existing facility licenses until offsite disposal or storage is available. The Commission reevaluated its initial WCD in 1990 and affirmed, with some modifications, the findings of the original decision (55 FR 38474; September 18, 1990). The Commission also modified Section 51.23 to conform the regulation to the revised findings (55 FR 38472; September 18, 1990). On December 6, 1999, the Commission issued a status report on the WCD. The report concluded that "experience and developments since 1990 confirm the Commission's 1990 Waste Confidence findings" (64 FR 68005).

The WCD finds that there is reasonable assurance that (1) safe disposal of radioactive waste and spent fuel in a mined geologic repository is technically feasible; (2) one or more geologic

repositories will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond expiration of any reactor license to dispose of high level waste (HLW) and SNF; (3) HLW and SNF will be managed safely until sufficient repository capacity is available to assure the safe disposal of all high-level waste and spent fuel; (4) if necessary, the SNF can be stored safely and without significant environmental impacts for at least 30 years beyond the reactor license expiration at either an onsite or offsite storage facility; and (5) safe independent onsite or offsite storage capacity will be available if needed.

Findings 2 and 5 relate to the availability of repository and storage capacity, respectively, and are not directly dependent on the type of spent fuel involved. Finding 1 on the technical feasibility of the safe disposal of spent fuel in a mined geologic repository generally recognized that different types of spent fuel might need to be accommodated in the repository. Moreover, Findings 3 and 4 specifically considered the storage of different types of spent fuel, including fuel from gas cooled reactors and spent fuel similar to the graphite-encased Pebble Bed fuel. In formulating Finding 3, the Commission considered the technical feasibility of using both wet and dry storage. Because of the form of the PBMR SNF, Exelon has stated that dry storage would be used. Although the basis for Finding 4 considered primarily light-water reactor (LWR) spent fuel, the basis references several reports that considered dry cask storage of spent fuel from gas-cooled reactors. These reports include “Dry Storage of Spent Nuclear Fuel: A Preliminary Survey of Existing Technology and Experience” (NUREG/CR-1223, 1980) and “Behavior of Spent Nuclear Fuel and Storage System Components in Dry Interim Storage” by A.B. Johnson et al. (PNL-4189, Rev. 1, August 1982).

The first report (NUREG/CR-1223) is a survey of the then-existing technology and experience with the dry storage of spent fuel. The report describes the experience with the dry storage of irradiated graphite fuel at the Irradiated Fuel Storage Facility at the Idaho National Engineering Lab (INEL). The graphite fuel included fuel from the high-temperature gas reactors at Peach Bottom I (Core 2) and Fort St. Vrain, and irradiated fuel from the Rover Nuclear Rocket Program. The report also discusses the experience with the storage of Peach Bottom I (Core 1) graphite fuel and Fermi I blanket fuel in dry storage at the Idaho Chemical Processing Plant at INEL. For both of these storage alternatives, the report notes that were no unusual or significant unexpected occurrences during the period of operation.

The second report (PNL-4189, Rev. 1) discusses the dry storage experience with gas-cooled reactor spent fuel, including graphite fuel, and concludes that “at all the operating facilities..., dry storage operations have been successful, with low radiation doses and no serious operational problems” (p. xii). One of these facilities was a vault to store pebble-bed gas-cooled test reactor fuel at the Julich Research Center (FRG). The report also concludes that all types of irradiated reactor fuel have been shipped and handled under dry conditions.

In addition to these two reports, the Commission, in its discussion of the safety of dry storage in the initial WCD, specifically referenced the DOE comments on the successful storage of reactor fuel from a sodium cooled graphite research reactor and from the Fort St. Vrain high-temperature gas reactor prototype facility. In response to these comments, the Commission stated that it was “confident that dry storage in installations can provide continued safe storage of spent fuel at reactor sites for at least 30 years after expiration of the operating license” (49 FR 34658, 34663, August 31, 1984).

Although Exelon has not submitted cask designs or information on potential accidents associated with PBMR fuel storage, there do not appear to be any technically insurmountable

issues. Since the original WCD, there has been a significant increase in knowledge and experience regarding the design and performance of dry casks. Designs of ISFSIs consider accident scenarios such as natural disasters and incorporate security and safeguard features. In addition, any potential long-term environmental impacts could be managed through the cask design process and compliance with the Commission's regulations, with potential environmental impacts being evaluated as part of future licensing actions.

In the Commission's 1990 reevaluation of the initial WCD, the Commission revised Finding 4 to indicate that spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation, including the term of a revised or renewed licenses. In regard to dry storage, the revised Finding 4 reflected the Commission's conclusions that (1) the material degradation processes of spent fuel in dry storage are well understood; (2) dry storage systems are simple, passive, and easily maintained; (3) both the NRC and dry storage operators have gained experience with dry storage that confirms the Commission's 1984 conclusions; and (4) the Commission maintains regulatory authority over any spent fuel installation (55 FR 38474, 38509, September 18, 1990).

The NRC staff evaluation that formed the basis for the reevaluation of the initial WCD cited the environmental assessment for 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Fuel and High-Level Radioactive Waste" (NUREG-1092), as support for its reaffirmation of Finding 4 (NRC Staff Waste Confidence Review Group's Final Waste Confidence Decision Review, 1990). The environmental assessment found that passive dry storage technologies are supported by experience from almost 40 years of dry storage of spent nuclear fuel, beginning with the extended vault and drywell tests conducted by INEL in 1964 on liquid metal fast breeder reactor fuel, and 12 years of research into passive dry storage technology in the United States and abroad. U.S. research conducted by INEL includes operations that began in 1971 with dry well storage of gas-cooled reactor fuel and vault storage of gas-cooled reactor fuel in 1975. The environmental assessment also includes a statement that the Commission made in response to the authorization proceedings on the Nuclear Waste Policy Act: "the Commission believes the information is sufficient to reach a conclusion on the environmental effects of dry storage. All areas of safety and environmental concern (e.g., maintenance of systems and components, prevention of material degradation, protection against accidents and sabotage) have been addressed and shown to present no more potential for adverse impact on the environment and the public health than the storage of spent fuel in water pools" (at II-7).

As noted above, Exelon also discusses DOE's responsibility to accept irradiated PBMR fuel under the NWPA. The volume of spent fuel produced by a PBMR facility is expected to be greater than that produced by a typical LWR. Because more detail on the actual design of the proposed PBMR facility is necessary, it is difficult to predict the actual volume of spent fuel that would be produced, or what impact that volume of spent fuel would have on the repository. With respect to the WCD's general consideration of the need for a second repository, the 1990 reevaluation noted that "since Congress specifically provided in the NWPA for a first repository, and required DOE to return for legislative authorization for a second repository, the Commission believes that Congress will continue to provide institutional support for adequate repository capacity" (55 FR 38474, 38508). This statement would seem to encompass any capacity concerns associated with a PBMR or other nuclear reactor facility in terms of the Commission's WCD. However, Exelon should discuss DOE's acceptance of PBMR SNF with DOE, as appropriate.

As part of the license application, Exelon will need to have approved fresh fuel and spent fuel casks. The staff notes that essentially all of the technical criteria used in the evaluation of a cask design's ability to safely contain spent fuel are based on experimental and actual performance data on light water fuel. As a result, Exelon will need to provide PBMR data on fuel geometry, confinement and containment, and fuel stability over time under both normal and accident conditions for interim storage and transportation scenarios to address the safety implications of the cask designs.

Staff Position

In reaching the various WCD findings that formed the basis for its Waste Confidence Rule in 10 CFR 51.23, the Commission specifically considered spent fuel similar to that which would be generated at a PBMR facility. Therefore, it appears that a PBMR facility would be within the scope of the generic determination in Section 51.23(a). The staff notes that although Exelon has not submitted cask designs or information on potential accidents associated with PBMR fuel storage, there do not appear to be any technically insurmountable issues. Since the original WCD, there has been a significant increase in knowledge and experience regarding the design and performance of dry casks. Designs of ISFSIs consider accident scenarios such as natural disasters and incorporate security and safeguard features. In addition, any potential long-term environmental impacts could be managed through the cask design process and compliance with the Commission's regulations, with potential environmental impacts being evaluated as part of future licensing actions. With respect to DOE's acceptance of PBMR spent nuclear fuel, Exelon should enter into discussions with DOE, as appropriate, to confirm that DOE will accept PBMR spent fuel.

D. Financial Qualifications

Issue

Are there regulatory and policy bases for establishing by rulemaking a class of non-utility licensees who need not submit the financial qualifications information otherwise required by 10 CFR 50.33(f)?

Current Regulations

Section 182(a) of the AEA requires license applications to include such information on the financial qualifications of the applicant as the Commission may specify by regulation. Section 50.33(f) of 10 CFR specifies the information sufficient to demonstrate to the Commission the financial qualifications of the applicant. Electric utility applicants are not required to provide this information, because the financial qualifications have been established for electric utilities on a generic basis under rulemaking. An electric utility is defined in 10 CFR 50.2 as "any entity that generates or distributes electricity and which recovers the cost of this electricity, either directly or indirectly, through rates established by the entity itself or by a separate regulatory authority." An application for a new facility may be submitted under either Part 50 or Part 52 of the regulations. In either case, a non-utility applicant is required to submit financial qualifications information as stated in 10 CFR 50.33(f).

Exelon's Position

Exelon states that the requirement to submit detailed financial qualifications information imposed by 10 CFR 50.33(f) is burdensome and unwarranted for applicants that have assets

or parental guarantees. For the first PBMR application, Exelon proposes to submit estimates for the total construction costs and annual operating costs for each of the first 5 years of operation of the entire PBMR facility and to identify the source of funds to cover such operating costs, as required by Appendix C of Part 50. Exelon also proposes that rulemaking be initiated to define, in Section 50.33(f), a new category of merchant generating companies (non-utilities) that will have the same status as utilities, if they satisfy certain criteria.

Discussion

The NRC issued the Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance (NUREG-1577, Rev. 1, March 1999) to describe the process it uses to review the applicant's financial qualifications and proposed methods of providing decommissioning funding assurance to evaluate compliance with the financial qualifications requirements of 10 CFR 50.33(f). Under these requirements, the NRC staff is obligated to conduct a financial qualifications review for each license application.

An electric utility is defined in 10 CFR 50.2. If an applicant does not fulfill the definition of an electric utility, it is deemed to be a nonutility. Utilities use rate base rate of return, which provides a more stable and regular income. Nonutilities face more competition in the marketplace than utilities and are not guaranteed a return by a state public service commission.

All the financial information required to fulfill 10 CFR 50.33(f) is information that the applicant will have at its disposal. The NRC seeks to review that financial information in order to have reasonable assurance that the facility will have the resources to operate safely. The staff believes it is premature to categorize any applicant with "assets or parental guarantees" before examining such assets or parental guarantees.

Staff Position

The Commission has the authority to determine by regulation, that a given class of non-electric utility applicants for nuclear power plant licenses shall not be required to submit financial qualifications information. However, Exelon has not yet presented sufficient technical and regulatory information that would support establishment of such a class of applicants, nor has the staff identified a reasonable basis for establishing such a class of applicants.

For the first PBMR application, Exelon must submit estimates for the total construction costs and annual operating costs for each of the first 5 years of operation of the entire PBMR facility and to identify the source of funds to cover such operating costs, as required by Appendix C of Part 50. Exelon's submittal will be reviewed by the staff using the process provided in the Standard Review Plan on Power Reactor Licensee Financial Qualifications and Decommissioning Funding Assurance (NUREG-1577, Rev. 1, March 1999).

E. Decommissioning Funding

Issue

Can a nonutility utilize an alternative method for decommissioning funding, such as partial prepayment?

Current Regulations

The regulations of 10 CFR 50.75 contain the requirements for providing decommissioning funding assurance. The regulations describe six methods of providing decommissioning funding assurance: These are (1) a sinking fund, (2) prepayment, (3) a corporate parent guarantee, (4) surety bonds, (5) contracts, and (6) a combination of the foregoing methods. Utilities are licensees that are rate-regulated and may use any of the six methods. Non-rate-regulated licensees, such as merchant plant operators, may not use the sinking fund method, but are allowed to use any of the other methods. The only notable exception to the above is a power reactor licensee that has the full faith and credit backing of the United States Government. This option entails a statement of intent containing a cost estimate for decommissioning and indicating that funds for the decommissioning will be obtained when necessary.

Exelon's Position

Most non-rate-regulated licensees have used the prepayment option for decommissioning funding. Exelon states that 100-percent prepayment for new plants might jeopardize the economic viability of any new plant to be operated as a merchant plant because of the higher present worth of the prepayment relative to other funding mechanisms, which allow payments at a later time. Exelon inquires whether some other funding arrangement, authorized under 10 CFR 50.75(e), may be feasible for a PBMR operated as a merchant plant. For example, Exelon proposes to accumulate funding at an accelerated rate. At the time of the first application, Exelon wants to propose an alternative decommissioning funding method for the PBMR. That alternative method could involve a partial payment of the total decommissioning cost estimate and annual contributions over the next 20 years. Exelon believes that the NRC can grant an exemption from Section 50.75(e)(1) to permit this alternative funding approach (or another new alternative method). Exelon has not yet decided on an alternative funding method. If the NRC is conceptually opposed to the use of partial prepayment with accelerated funding over 20 years, Exelon would like to know as soon as possible. Exelon also proposes that rulemaking be initiated to modify Section 50.75(e)(1) to explicitly authorize the use of the to-be-proposed alternative funding method.

Discussion

The intent of this regulation is to provide assurance that decommissioning funding is available, particularly in the event of a permanent shutdown of the plant prior to the expiration of the license. Exelon is proposing to seek a license as a nonutility or a non-rate-regulated entity. As a nonutility, according to the regulations, all funding options are available except the sinking fund option. A sinking fund is a fund that is accumulated by making periodic deposits and is reserved for a specific purpose, such as retirement of debt or decommissioning of a commercial nuclear reactor. The fund is characterized by making uniform periodic payments at compound interest in order to accumulate a given sum at a given future time. Exelon's proposal is a form of a sinking fund. The staff does not believe that Exelon's proposal provides the same level of assurance as other funding options available to non-rate-regulated entities. Thus, the staff believes that Exelon's proposed method is not consistent with current requirements. Further, an exemption to use a sinking fund is likely to be difficult to justify technically since Exelon, as a nonutility, would not have a rate base rate of return (i.e., a guaranteed rate base).

However, as noted in the staff's position in item F., "Minimum Decommissioning Cost Estimates," Exelon would be able to use an adequately justified site-specific estimate for decommissioning its pebble bed modular reactor. Because Exelon's decommissioning cost estimate would be based on a site-specific study, the staff interprets 10 CFR 50.75(e)(1)(i) (the prepayment option) to allow Exelon to take the 2-percent real earnings credit for the whole period, if necessary, depending on the timing of each module's final decontamination schedule and the schedule of cash flows necessary to complete decommissioning if specifically outlined in the site-specific estimate. The present value of even a relatively large decommissioning cost, when discounted back at 2-percent real rate of return, should not be very large and should thus not require an onerous initial deposit.

Staff Position

Exelon proposes to seek a license as a nonutility. A nonutility cannot use the sinking fund option. Exelon's proposed payment scheme would not provide the same assurance of decommissioning funding as the other funding options. However, the staff interprets the regulation to allow Exelon, using the prepayment option, to use a site-specific decommissioning cost estimate and take the 2-percent real earning credit. Exelon would therefore not be required to make an onerous initial deposit.

F. Minimum Decommissioning Cost Estimates

Issue

Can a PBMR licensee submit decommissioning cost estimates specifically for a PBMR and on a per module basis?

Current Regulations

The minimum amount of decommissioning funds required of BWRs and PWRs is regulated through the minimum decommissioning funds equation in 10 CFR 50.75(c). There is no formula specifically for gas-cooled reactors. However, the regulations allow the use of a site-specific estimate instead of the amount calculated through the generic formula.

Exelon's Position

The current regulations specify decommissioning cost estimates for BWRs and PWRs but not for gas-cooled reactors. The design of a PBMR is significantly different from the design of a BWR or PWR. As a result, Exelon believes the cost estimates are not appropriate for a PBMR module or facility. Exelon proposes that the first PBMR application include a decommissioning cost estimate specifically for a PBMR. Additionally, Exelon proposes that the cost estimate apply to a single module since the construction of the modules may be staggered.

Discussion

The staff agrees with Exelon that there are currently no regulations that specifically deal with minimum decommissioning cost estimates for gas-cooled reactors. The staff further recognizes that, since the regulations do not specifically address gas-cooled reactor decommissioning cost estimates, a site specific decommissioning cost estimate submitted with the first application

could set the standard for subsequent gas-cooled reactors. The initial decommissioning cost estimate will need to be reviewed for adequacy from both the technical and financial perspectives.

Staff Position

The staff is willing to accept a minimum decommissioning cost estimate specifically for the PBMR, if the staff finds the technical justification to be acceptable. The staff is willing to review a standard decommissioning cost estimate based on the decommissioning of one module, which can then be applied multiple times for the facility in question, or alternatively, a cost estimate based on the decommissioning of multiple modules at a single location. Regardless of the method used, the resulting estimate must include the cost of decommissioning common elements and structures associated with the facility, in addition to the costs of decommissioning each individual module.

G. Antitrust Review Authority

Issue

Can the NRC except applicants for nuclear plants that will be operated as merchant plants from the prelicensing antitrust review?

Current Statutory Provisions and Regulations

The NRC's antitrust responsibilities are set forth in Section 105 of the Atomic Energy Act of 1954 (AEA). Section 105c, as amended in 1970, requires the NRC to conduct an antitrust review of applications for construction permits or combined operating licenses, seek the advice of the Attorney General in conducting this review, and provide an opportunity for members of the public to request a hearing in connection with this review. Section 105c prescribes the process for conducting a prelicensing antitrust review and making findings as to whether activities under the license would create or maintain a situation inconsistent with antitrust laws. Pursuant to 10 CFR 50.33a, prospective applicants must submit the required antitrust review information to the NRC at least 9 months prior to the application for a construction permit or combined license. This information, which is set forth in Appendix L to 10 CFR Part 50, includes detailed transmission, distribution, and business planning information. Under Section 105c.(7) of the AEA, the NRC has the authority, subject to the approval of the Attorney General, to determine that the issuance of certain classes or types of licenses "would not significantly affect the applicant's activities under the antitrust laws" and, therefore, to except such applicants from the NRC's antitrust review requirements. The NRC also has the authority, under Section 105c.(6) of the AEA, to issue a license with appropriate antitrust conditions, based on the findings of the antitrust review.

Exelon's Position

Pursuant to Section 105c of the AEA, NRC is required to determine whether activities under the license would create or maintain a situation "inconsistent with the antitrust laws." In some instances, these reviews and associated hearings have resulted in the inclusion of various antitrust conditions in the licenses. These conditions have often involved access to transmission. Exelon believes that the antitrust provisions have limited applicability in the modern electric industry and serve no useful purpose with respect to the proposed operation of the nuclear reactor as a merchant plant. Recognizing the current status of competition in the

electric utility industry and the competitive realities surrounding the operation of a merchant nuclear plant, the NRC should make a determination that merchant plant applicants that meet certain criteria (e.g., exempt wholesale generators (EWGs) or generators authorized to sell power wholesale at market-based rates) are excepted from NRC antitrust review.

Exelon proposes that the NRC initiate a proceeding, and seek approval from the Attorney General, to define a new category of merchant generating companies (nonutilities) and except them from antitrust reviews. Exelon also proposes that rulemaking be initiated to clarify that newly defined "merchant plants" are not required to submit antitrust information. Exelon is working with the Nuclear Energy Institute (NEI) to support the creation of the excepted class for merchant plants.

Staff Position

The ability of the NRC to except certain applicants for new nuclear generating facilities from the NRC's antitrust review requirements is being addressed separately by the Office of the General Counsel.

H. License Issues

H.1 Number of Licenses for Modular Reactors

H.2 Application of License Duration for One COL for Multiple Reactors

H.3 Duration of Design Approval Under One COL for Multiple Reactors

Issues

Can one combined license be issued for multiple PBMR module reactors co-located at a single site? If so, how should the license life be applied? If a single COL is issued for multiple PBMR module reactors, what should be the effective duration of the PBMR design approval?

Current Statutory Provisions and Regulations

Section 103 of the AEA states:

a. The Commission is authorized to issue licenses to persons applying therefore to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export under the terms of an agreement for cooperation arranged pursuant to Section 123, utilization or production facilities for industrial or commercial purposes. Such licenses shall be issued in accordance with the provisions of Chapter 16 and subject to such conditions as the Commission may by rule or regulation establish to effectuate the purposes and provisions of this Act.

b. The Commission shall issue such licenses on a nonexclusive basis to persons applying therefor (1) whose proposed activities will serve a useful purpose proportionate to the quantities of special nuclear material or source material to be utilized; (2) who are equipped to observe and who agree to observe such safety standards to protect health and to minimize danger to life or property as the Commission may by rule establish; and (3) who agree

> to make available to the Commission such technical information and data concerning activities under such licenses as the Commission may determine necessary to promote the common defense and security and to protect the health and safety of the public. All such information may be used by the Commission only for the purposes of the common defense and security and to protect the health and safety of the public.
>
> Each such license shall be issued for a specified period, as determined by the Commission, depending on the type of activity to be licensed, but not exceeding forty years, and may be enewed upon the expiration of such period.

Section 161.h. of the AEA provides that the Commission may:

> Consider in a single application one or more of the activities for which a license is required by this Act, combine in a single license one or more of such activities, and permit the applicant or licensee to incorporate by reference pertinent information already filed with the Commission.

Section 185.b. of the AEA states:

> After holding a public hearing under Section 189a.(1)(A), the Commission shall issue to the applicant a combined construction and operating license if the application contains sufficient information to support the issuance of a COL and the Commission determines that there is reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of this Act, and the Commission's rules and regulations. The Commission shall identify within the COL the inspections, tests, and analyses, including those applicable to emergency planning, 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 this Act, and the Commission's rules and regulations. Following issuance of the COL, the Commission shall ensure that the prescribed inspections, tests, and analyses are performed and, prior to operation of the facility, shall find that the prescribed acceptance criteria are met. Any finding made under this subsection shall not require a hearing except as provided in Section 189a.(1)(B).

10 CFR 50.52 states:

> The Commission may combine in a single license the activities of an applicant which would otherwise be licensed severally.

10 CFR 52.103(g) states:

> Prior to operation of the facility, the Commission shall find that the acceptance criteria in the COL are met. If the COL is for a modular design, each reactor module may require a separate finding as construction proceeds.

Exelon's Position

Exelon argues that the definition of a "utilization facility" in Section 101 of the AEA is broad and could be interpreted as including a set of integrated reactor modules. In 10 CFR 50.2, a "utilization facility" is defined as "any nuclear reactor." Under this section, each module could be classified as a "nuclear reactor." However, both the AEA and the implementing regulations in 10 CFR 50.10(a) make it unlawful for a person to possess or use a utilization facility except as authorized by a license that has been issued by the Commission. Neither the AEA nor NRC regulations require that each utilization facility have a separate license. Exelon believes that the Commission could, consistent with the language of Section 101 of the AEA and 10 CFR 50.10, issue a single license for multiple modules (reactors).

Exelon asserts that issuing a single license for multiple PBMR modules would have several beneficial (to Exelon) effects. First, according to Exelon, issuance of a single license for multiple modules (reactors) would enable the modules to be treated legally, as well as practically, as a single nuclear facility (e.g., for the purposes of Price-Anderson financial protection requirements, annual fees and operating staffing). Further, issuance of a single license for a facility consisting of multiple modules would have other benefits, such as promoting administrative efficiency and standardization among modules. Exelon proposes that the first PBMR application seek a single license for a set of modules (reactors). Additionally, Exelon proposes that rulemaking be initiated to clarify that a "set" of modules may be treated as a single nuclear facility for licensing and "other purposes."

Discussion

Section 103 of the AEA, "Commercial licenses," authorizes the Commission to issue licenses for, inter alia, the possession and use of "utilization. . .facilities for industrial or commercial purposes." It would be difficult to interpret the applicable provisions of the AEA as allowing multiple reactor modules co-located at a single site to be treated as a single "utilization facility." While Section 161.h. of the AEA authorizes the Commission to combine in a "single license" activities for which a license is required by the AEA, the legislative history of the AEA does not reflect any consideration of this current issue. Rather, it shows that Congress intended Section 161.h. to allow the Commission discretion to issue a single license which combines in one license what would otherwise require many separate licenses for the essentially integrated activity of power generation at a single facility– for example, licenses authorizing operation, licenses for the possession and use of byproduct materials, and licenses authorizing possession and use of special nuclear materials for that facility. The construction and operation of power reactor modules of substantially similar design, co-located at the same site in a power station specifically designed for such reactor modules, may arguably be sufficiently similar to what Congress had in mind (i.e., combining licenses), that Section 161.h. might form a basis for combining individual COLs for such reactor modules in a single combined COL.

It is not clear that a single combined COL would confer all of the benefits anticipated by Exelon (e.g., a single Price-Anderson application and annual fee). For example, the Commission has recently made clear, in communications with Congress, that Price-Anderson retrospective premium payments must be made on a per reactor basis. Combining multiple reactor modules under one license would not obviate the need for retrospective premium payments for each reactor. Additionally, the term of operation for a single combined COL would be limited to 40 years from the date of issuance of the COL. Sequential 40-year terms for each reactor module are not possible inasmuch as only a "single license" would be issued. The legislation recently submitted by the Commission addressing 40-year terms, if enacted, would permit the

40-year term of operation to begin when the Commission makes the initial 10 CFR 52.103(g) finding, but would not permit sequential 40-year terms.

The issuance of a single COL for multiple PBMR modules would grant the licensee approval to initiate construction of a PBMR at any time during the 40-year duration of the license. Therefore, the effective duration of the PBMR design approval is also 40 years. The licensing plan is inconsistent with the Commission's current policy on duration of design approvals. Because of this inconsistency, the staff believes that further consideration should be given to the possible issuance of one COL for multiple reactors, as it relates to the effective duration of a design approval.

The NRC has issued a number of preliminary and final design approvals under Appendix O to 10 CFR Part 52 and, prior to 1989, under 10 CFR Part 50. Since 1978, these design approvals have been issued with a duration of five years (see "Policy Statement on Standardization of Nuclear Power Plants," 43 FR 38954, August 31, 1978). In the same *Federal Register* notice, the concept of a manufacturing license is discussed. Manufacturing licenses are issued under Appendix M to Part 52 (38 FR 30253, November 2, 1973) and would authorize a number of identical nuclear power plants to be manufactured at one location and moved to a different location for operation. The number of units specified in the license is that number whose start of manufacture could practically begin within a 10 year-period commencing on the date of issuance of the manufacturing license. However, in no event will the number be more than 10. The manufacturing license requires the plant design to be updated no later than 5 years after its initial approval. The number of units specified in the license will be reduced if the plant design incorporates a reference system design whose term of approval ends sooner than the approval periods of the manufacturing license.

In 1989, the Commission decided to grant a duration of 15 years for a standard design certification issued under Subpart B of Part 52 (see 10 CFR 52.55(a), "Duration of Certification"). However, the Commission did not change its policy for issuance of design approvals under Appendix O. The licensing processes in Part 52 demonstrate that the Commission has always imposed a time limit on design approvals that can be referenced in an application to build nuclear power plants. After the duration expires, the design would have to meet current requirements and be reviewed against current operating experience before it could be built.

The current process in 10 CFR Part 52 for issuing a COL does not designate a duration for a reactor design approval after the issuance of the COL. For a single reactor plant or a single power block with 2 or 3 reactors, this question is not normally an issue because the reactor plant or power block would typically be constructed in response to the demonstrated need for power. However, for the multiple reactor COL, Exelon envisions a possible scenario whereby one module could be constructed at the beginning of the COL and construction of additional modules could be staggered over the license life in response to future power demands. The question is whether the NRC should allow the same reactor design to be built a substantial number of years after issuance of the license without reconsidering the acceptability of the original design.

During the preparation of Part 52, the NRC did not envision the delayed construction of multiple reactors that is possible under the PBMR licensing plan. If one license is issued for multiple modular reactors, the licensee will be allowed to build multiple reactors at any time during the 40-year license life. As a result, subsequent reactors may not meet new regulations and regulatory guidance issued after or incorporate lessons learned from operation of the

initial reactor. Additionally, the staff will not have the opportunity to reevaluate the design at the 5-year interval that was envisioned for design approvals. The non-constructed reactors would be treated as fully constructed reactors in that any changes the staff wished to impose would need to satisfy the criteria of 10 CFR 50.109 (Backfit).

If separate licenses are issued for each modular reactor or set of modular reactors that are to be built close in time to construction authorization, the licensee would be required to meet new regulations and regulatory guidance at the time of license approval and the NRC staff would not be constrained by 10 CFR 50.109. This plan would require the licensee to address all current rules and regulations at the time of application, which would coincide with the time that the reactor(s) would be constructed. This would also allow the staff to address lessons learned from the operating reactors without meeting the backfit criteria. The staff expects that the review time for separate licenses for ten modular reactors would be somewhat longer due to additional administrative work for the licensee to submit and the staff to process each license application.

Staff Position

Congress did not specifically address the prospect of combining individual COLs for multiple reactor modules into a single combined COL. Nevertheless, there appears to be nothing in the legislative history of the AEA which explicitly precludes the possibility that the Commission may, under the authority of Section 161.h., combine into a single license the individual Part 52 COLs for reactor modules of a substantially similar design co-located at a single site. If the Commission considers this course, it should also consider rulemaking to clarify: (i) the nature of “reactor modules” and modular designs whose licensing may be combined under the authority of Section 161.h. of the AEA and 10 CFR 50.52 and (ii) the process for making findings under 10 CFR 52.103(g) for reactor modules (and possibly the process for NRC staff inspection and publication of notices concerning completed ITAAC in 10 CFR 52.99).

The term of operation for a single combined COL would be limited to 40 years from the date of issuance of the COL. Sequential 40-year terms for each reactor module are not possible inasmuch as a “single license” would be issued. Legislation recently submitted by the Commission addressing 40-year terms would, if enacted, permit the 40-year term of operation to begin when the Commission makes the initial 10 CFR 52.103(g) finding, but would not permit sequential 40-year terms.

The staff has a concern with the effective duration of a design approval resulting from a multiple module license issued under 10 CFR Part 52. Therefore, if a single combined license is issued for multiple modules (nuclear reactors), then the license should be conditioned so that the design can be reviewed every 5 years without the constraints of the backfit requirement in 10 CFR 50.109.

I. Annual Fee Issues

I.1 Annual Fee Assessment

I.2 Commencement of Annual Fees

Issues

How should annual fees be assessed for a set of modular reactors that constitute a PBMR facility? When should annual fees commence for a facility that has been issued a combined operating license?

Current Statutory Provisions and Regulations

The Omnibus Budget Reconciliation Act of 1990, as amended (OBRA), requires that the NRC assess annual fees and that the fees be established through rulemaking. The statute establishes two standards for the annual charges. Fees charged must be "fair and equitable" in allocating the "aggregate amount of charges" among licensees; and, "to the maximum extent practicable," fees charged must have "a reasonable relationship to the cost of providing regulatory services and may be based on the allocation of the Commission's resources among licensees or classes of licensees."

The NRC's annual fee regulations in 10 CFR Part 171 cover annual fees for Part 50 licenses, but do not specifically cover annual fees for combined licenses issued under Part 52. Additionally, neither Part 52 nor Part 171 addresses when NRC would begin to charge annual fees to a person holding a Part 52 combined license. Prior to the issuance of any Part 52 combined license, Part 171 should be modified to specifically establish the annual fee requirements for these licensees.

Currently, 10 CFR 171.15(a) states that "each person licensed to operate a power, test, or research reactor . . . shall pay the annual fee for each unit for each license held." Prior to the final FY 1999 fee rule, 10 CFR 171.15(a) stated that "each person licensed to operate a power, test, or research reactor shall pay the annual fee for each unit for which the person holds an operating license." A separate license is currently issued for each unit and accordingly an annual fee is assessed per license.

Exelon's Position

The current provision of 10 CFR 171.15(a) – that each person licensed to operate a power reactor shall pay an annual fee for each unit for each license – would allow the NRC to impose a separate fee for each PBMR module. The annual fee for a 10-module PBMR facility would be greatly disproportionate to the annual fee for an equivalent-sized (in MWt) BWR or PWR. This could place a modular reactor design at a competitive disadvantage with other designs and deter the development of modular reactors. While it is not the NRC's responsibility to be concerned about competition among various reactor designs, the NRC's regulations and requirements should not impose unnecessary burdens on licensees. The NRC has stated that "the bulk of its licensee-related activities have [been] and will continue to be directly related to the regulation of large power reactors" (51 FR 24084). Exelon presumes that this statement explains the apparent decision to require fees be paid for each reactor instead of for the entire facility or site. In 1986, when the rule was originally considered, almost all commercial nuclear power facilities were large reactors, and a multiple modular facility had not yet been developed or approved.

Exelon believes it is not reasonable to treat multiple PBMR modules at a site in the same manner as multiple PWRs or BWRs at a site. For several reasons, Exelon contends that the regulatory effort for a 10-module facility will be comparable to or less than the effort required for a large BWR or PWR. For example, Exelon assumes that the modules at a site will have a single licensing basis. Additionally, Exelon maintains that the design is simpler and safer than the design of the PWR or BWR, thereby simplifying NRC's oversight responsibilities.

Furthermore, Exelon claims that because the NRC assesses annual fees in part to recover costs that cannot be assigned to any particular facility, this would penalize Exelon for selecting a modular design rather than a large light-water-reactor design and would discourage the development of safer technology.

Exelon proposes that rulemaking for 10 CFR 171.15 be initiated and completed prior to the first PBMR application to specify that only one annual fee will be required for each set of PBMR modules. According to Exelon, in this rulemaking, the NRC should define the term "modular facility" and limit the total power of a modular reactor facility to 1500 MWe.

Discussion

It is clear from the language of OBRA that the NRC has flexibility in determining policies and practices in recovering the statutorily directed amount. The Commission is within its statutory bounds as long as the rule results in a fair and equitable allocation of costs to all licensees and as long as there is a reasonable relationship between the services rendered by the agency and the costs charged for those services.

The establishment of annual fees for a PBMR facility licensed under Part 52 will require revisions to Part 171 and a decision on whether to create a new fee category for modular reactors. Revisions to Part 171 will be required to specifically authorize annual fees to be charged to facilities licensed under Part 52, to clarify that an annual fee is charged per license, not per unit, and to establish when NRC will begin to charge an annual fee to a person holding a Part 52 combined license. With respect to the last revision, under Section 6101(c)(1) of OBRA, the NRC may impose annual fees on licensees. Although a construction permit is a license, the NRC has not imposed and currently does not impose annual fees on those persons holding a power reactor construction permit. Consistent with this approach, for a Part 52 combined license, the staff plans to assess the annual fee only after construction has been completed, all regulatory requirements have been met, and the Commission has authorized operation of the reactor(s). Additionally, the annual fee would be assessed based on the existence of a license authorizing operation. The annual fee would not be prorated for the number of reactor modules in operation. This is because the NRC does not consider the economic advantages or disadvantages of possessing a license when assessing annual fees.

The annual fee for each operating power reactor is currently determined by dividing the total annual fee amount for the power reactor class by the number of operating power reactor licenses. If it were able to combine into a single license the authorizations for multiple modular reactors, the staff currently anticipates that up to 10 pebble bed modules might be combined under a single license. In this instance, with the above revisions to Part 171, a single license authorizing operation of a PBMR would be subject to an annual fee comparable to the annual fee for a Part 50 operating license regardless of the number of modules at the site, unless Part 171 is revised to establish a specific annual fee schedule for a PBMR license.

However, if the agency decides to issue a separate license for each PBMR module, or if the agency regulatory oversight necessary for the PBMR is significantly different than that required for other operating power reactors, the Commission could initiate a Part 171 rulemaking to create a separate fee class for small modular design reactors. With respect to the agency's regulatory oversight, annual fees for a given class of licenses are based on NRC's budgeted costs allocated to the class for generic activities and other costs not recovered under 10 CFR Part 170. It is not clear whether the agency's generic and other efforts to regulate a PBMR will be significantly different from its regulation of other types of operating power reactors.

Currently, NRR does not expect the generic regulatory oversight of PBMRs to be significantly different from the oversight of existing reactors. Depending on how the regulatory efforts differ and the magnitude of NRC resources required, a separate class of licensees could be established.

While a PBMR license potentially having up to 10 modules might have more megawatt output capacity than any existing reactor, historically, the limits of that capacity have not been a consideration in determining the annual fee amount. This is because the NRC has found no necessary relationship or predictive trend between the thermal megawatt rating of a power reactor and NRC regulatory costs.

In summary, costs must be assessed in a "fair and equitable" manner and, "to the maximum extent practicable", reflect a "reasonable relationship" between the fees charged and the services rendered. Thus, if the NRC's regulatory costs for PBMRs were approximately the same as for existing power reactors and the license includes multiple modules, the PBMR annual fee would be of the same magnitude as for existing power reactors. However, if the NRC's regulatory costs were significantly lower or higher than those for other types of operating reactors or if a separate license was issued for each module, the Commission could establish a separate license fee class.

Staff Position

The CFO plans to include in the FY 2002 fee rulemaking, revisions to Part 171 that would specifically authorize annual fees to be charged to facilities licensed under Part 52; clarify that the NRC annual fee is charged per license, not per unit; and establish when NRC will begin to charge an annual fee to a holder of a Part 52 combined license. Until a final decision is made on the number of modules that will be allowed under a single license, and the NRC receives sufficient information from Exelon to enable it to determine what kind of regulatory oversight the proposed design will likely require, no staff recommendations on establishing a new license fee category for modular reactors will be offered.

For a Part 52 combined license, the staff plans to assess the annual fee only after construction has been completed, all regulatory requirements have been met, and the Commission has authorized operation of the reactor(s).

J. Financial Protection

Issue

Should Price-Anderson financial protection requirements be applied to each modular reactor unit or to the entire PBMR "facility"?

Current Statutory Provisions and Regulations

The Price-Anderson Act, which is contained in Section 170 of the AEA (42 U.S.C. § 2210), is implemented by the NRC via its 10 CFR Part 140 regulations. The Price-Anderson Act contains three distinct elements or components. First, it establishes a ceiling on the aggregate damage award for nuclear tort claims that can be imposed against an entity involved in the use or handling of radioactive material. Second, it indemnifies any entity exposed to potential liability for activity resulting in a nuclear incident, even if the entity did not directly participate in the activity. Third, it establishes an indemnification scheme through which the federal

government requires entities involved in nuclear activities to obtain private insurance to a certain level.

With respect to the third component, the Price-Anderson indemnification scheme, Section 170b. of the act establishes that the amount of primary financial protection required for facilities designed to produce substantial amounts of electricity and having a rated capacity of 100,000 electric kilowatts (100 MWe) or more must be equal to the maximum amount of commercially and reasonably available nuclear liability insurance, which is currently $200 million (42 U.S.C. § 2210b.(1)). Primary financial protection may include private insurance, private contractual indemnities, self-insurance, other proof of financial responsibility, or some combination thereof. In addition, Section 170b. requires licensees of such facilities to participate in an industry retrospective rating plan, or secondary layer of protection, which provides for the assessment of additional deferred premiums in the event that the public liability from a nuclear incident exceeds or appears likely to exceed the level of primary financial protection required of the licensee involved in the nuclear incident. The total amount of financial protection presently available under the act from both the primary and secondary layers is approximately $9.7 billion (the primary layer of $200 million plus a secondary layer of approximately $9.5 billion, based upon a maximum retrospective premium of $88.095 million per nuclear incident per nuclear facility).

The NRC's implementing regulations impose these financial protection requirements on each nuclear reactor a licensee is authorized to operate (10 CFR 140.11). A "nuclear reactor" is defined as "any apparatus, other than an atomic weapon, designed or used to sustain nuclear fission in a self-supporting chain reaction" (10 CFR 140.3(f)). The maximum amount of the standard deferred premium that may be charged per nuclear incident is $88.095 million ($83.9 million plus a maximum 5% surcharge assessed under Subsection 170o(1)(E) of the act) for each facility (nuclear reactor) for which the licensee is required to maintain the maximum amount of primary financial protection, but no more than $10 million per year (10 CFR 140.11(a)(4)).

Exelon's Position

The requirement in 10 CFR 140.11 that each nuclear reactor have financial protection has significant implications for modular facilities. Without relief, Exelon states that 10-module facilities would assume secondary financial liability roughly equal to the entire financial protection that is available under the Price-Anderson Act today. It is argued that this result would be contrary to the intent of the Price-Anderson Act to spread the risk of liability across the industry.

Although 10 CFR 140.11 imposes financial protection requirements on each "nuclear reactor," the AEA requires each "license" to have a condition requiring a "licensee" to maintain financial protection. Section 170(b) of the AEA requires each licensee to have primary financial protection for facilities and to have secondary financial protection for facilities designed for a rated capacity of 100 megawatts or more.

Exelon maintains that the NRC has the authority to grant Exelon an exemption from 10 CFR 140.11 for the first PBMR application, so that the PBMR facility is treated as an equivalent-sized LWR. Exelon argues that its potential liability for retrospective premiums in the event of an accident at another plant should not be substantially higher than the liability of an equivalent-sized LWR merely because a modular design is used rather than a large LWR design. In the application, Exelon proposes to show that the risks of a severe accident at a

10-module PBMR facility are less than the risks of a severe accident at an LWR. Therefore, Exelon contends that the risk that another nuclear plant will incur retrospective liability under the Price-Anderson Act as a result of an accident at the PBMR facility is less than the risk of such liability from an accident at an LWR. In the first application, Exelon also proposes to provide additional support for an exemption, including a technical justification for the exemption based upon a comparison of the risks of a PBMR facility and an LWR. Exelon also proposes that rulemaking be initiated to state that financial protection requirements apply to a licensee for a nuclear facility and define a facility as including multiple reactor modules at a site. According to Exelon, the definitions of utilization facility and nuclear reactor in 10 CFR 50.2 should also be amended to include multiple reactor modules co-located on one site. Exelon suggests that a modular nuclear reactor facility produce no more than 1500 MWe. Such a limit, Exelon maintains, provides a reasonable basis for rulemaking by placing a modular nuclear facility on a equivalent footing with a current LWR for purposes of the Price-Anderson Act.

Staff Position

The Commission has stated its position, in letters to Congress, on the application of Price-Anderson financial protection requirements to multiple modular reactor units co-located at a single site. (See letter from Dennis K. Rathbun (Director of Congressional Affairs, NRC) to U.S. Senator Frank Murkowski, dated July 26, 2001, ADAMS ML012110067; and letter from Dennis K. Rathbun (Director of Congressional Affairs, NRC) to U.S. Senator Jeff Bingaman, dated July 26, 2001, ADAMS ML012130057.)

The Commission stated, in part, “that it believes there are substantial doubts whether it has authority to treat multiple reactor units as only one facility for purposes of the retrospective assessment because the specific financial protection and retrospective assessment provisions in Section 170b. [of the AEA] are specified for a ‘facility’, elsewhere defined as a single reactor or even an important component part of a reactor. In our view, Congress should amend the AEA if it seeks to assure that multiple modular units at a single site are treated as a single facility.”

K. Testing of New Design Features for a Combined License

Issue

Should a COL be issued before completion of all testing that is necessary to demonstrate the performance of safety systems and components?

Discussion

Exelon set forth its licensing plan for the PBMR in a letter to the NRC dated May 25, 2001 (ADAMS ML011520314). In that plan, Exelon assumed that a full-scale prototype of the PBMR will be built in South Africa and that all demonstration testing will be performed on that prototype. Exelon also assumed that it will receive a COL for the first PBMR prior to completion of demonstration testing on the prototype plant. Furthermore, Exelon stated that completion of prototype testing is not required prior to issuance of a COL.

The Commission reformed its licensing process for commercial nuclear power plants with the issuance of 10 CFR Part 52 in 1989. One of the principal issues in the development of Part 52

was the inclusion of requirements to demonstrate the performance of new or innovative safety features for advanced designs prior to licensing (54 FR 15372, April 18, 1989). These requirements may be met with either separate effects tests, prototype tests, or a combination of tests, analyses, and operating experience, as described in 10 CFR 52.47(b)(2). These requirements were included, as intended, in the original rulemaking for Subpart B of Part 52, "Standard Design Certifications." However, the NRC failed to include the same requirements in Subpart C of Part 52, "Combined Licenses," for custom plant designs. Because the NRC intended that the testing requirement apply to all new reactor designs, the staff plans to correct this oversight in the rulemaking to update Part 52. Revised Section 52.79(b) in the draft rule language for Part 52 corrects the oversight and is available in the NRC's rulemaking web site. Stakeholders can comment on the staff's proposed correction in the draft rule language or at the proposed rule stage.

The determination of what tests, if any, are needed to demonstrate the acceptability of the PBMR design will be made during the COL review. In a letter dated August 23, 2001 (ADAMS ML011910207), the staff stated that, consistent with 10 CFR 52.79(b) and 50.34(b) requirements, Exelon's application for a COL must include sufficient information to demonstrate that PBMR safety features will perform as predicted in the final safety analysis report. This determination may begin during the pre-application review for PBMR but will not be resolved until the final design is completed. The staff may also decide to perform some independent confirmatory testing. However, any confirmatory testing performed by either Exelon or the staff may not need to be completed prior to issuance of the COL. The process for deciding what testing is necessary for advanced reactor designs is discussed in SECY-91-074, "Prototype Decisions for Advanced Reactor Designs," dated March 19, 1991 (ADAMS ML003707900).

The NRC staff's concern with Exelon's licensing plan is that if necessary testing is performed after issuance of the COL, information obtained from those tests could affect the acceptability of the design. If testing is necessary to demonstrate the acceptability of the PBMR design, it would be prudent for Exelon and the NRC to agree upon the test program scope and objectives before performing any separate effects, prototype, or demonstration testing and before constructing any facility for such purposes. Also, the test program, its implementation, and those aspects of the design and construction of the test facilities critical to achieving the test program objectives must comply with the applicable requirements of Appendix B to 10 CFR Part 50. If Exelon completes necessary testing before issuance of a COL and the test program meets the applicable Appendix B requirements, then the staff's concern is resolved.

Staff Position

The NRC has initiated rulemaking to update 10 CFR Part 52 and will request public comment on its proposed revisions tp Part 52. In the current draft rulemaking language that was made available on the NRC's rulemaking web site, the NRC staff proposed to revise Subpart C of Part 52 to make it consistent with Subpart B of Part 52 and the original intent of Part 52. Thus, if approved, revised Part 52 would require that all testing determined to be necessary to demonstrate that new design features will perform as predicted in the final safety analysis be completed before issuance of the COL. A recommendation on this issue will be made after review of public comments provided in response to the proposed Part 52 rule change.