PUBLIC WORKSHOP

Legal and Financial Issues Related to Exelon's Pebble Bed Modular Reactor -SECY-01-0207

March 27, 2002

WORKSHOP AGENDA

1:00 - 1:05	Agenda Overview/Workshop Format	(F. Cameron)
1:05 - 1:10	Opening Remarks	(M. Gamberoni)
1:10 - 1:20	Background/PBMR Pre-Application	(A. Cubbage)
1:20 - 2:45	Issues/Discussion	
	• Number of Licenses	(J. Wilson)
	• Annual Fees	(G. Jackson)
	• Testing of New Design Features	(J. Wilson)
2:45 - 3:00	Break	
3:00 - 5:00	Issues/Discussion (Continued)	
	• Fuel Cycle Issues	(D. Allison/T. Harris)
	• Operator Staffing	(C. Goodman)
	• Financial Issues	(J. Moore/M. Dusaniwskyj)
	• Decommissioning Funding	(M. Dusaniwskyj)
5:00	Adjourn	

WELCOME

Marsha Gamberoni, Deputy Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Background
PBMR Pre-Application

Amy Cubbage, Project Manager
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Background/PBMR Preapplication

- Pebble Bed Modular Reactor (PBMR)
  - Gas-cooled reactor design
  - 110 - 140 MWe modules
  - Up to 10 modules per facility
- Exelon plans to submit application for combined license (COL) for PBMR in early CY 2004
  - COL - license for construction and operation
- Preapplication review started in April 2001
  - Monthly meetings between NRC, Exelon, Department of Energy, and other interested stakeholders
    - Legal and financial issues
    - Licensing approach
    - Identify key technical, safety, and policy issues

Background/PBMR Preapplication

- May 10, 2001, letter from Exelon identified issues related to modular plants, gas-cooled reactors, and merchant plants
- SECY-01-0207 provides preliminary staff positions on Exelon identified issues and related issues identified by the staff
- Staff seeks stakeholder feedback on preliminary positions
  - Workshop
  - Comments in writing may be provided by April 10

    Amy Cubbage, U.S. NRC, Mail Stop O-11D17,
    Washington, D.C. 20555-0001
  - Final policy recommendations on these issues - June 2002
- Preapplication review will continue until June 2003

Number of Licenses for a Facility with Multiple Reactors

Jerry Wilson, Senior Policy Analyst
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Number of Licenses for a Facility with Multiple Reactors

EXELON PROPOSAL:

- Exelon will apply for a single license for multiple PBMR modules

ISSUE:

- Can one combined license be issued for multiple reactors co-located at one site?

Number of Licenses for a Facility with Multiple Reactors

PRELIMINARY STAFF POSITION:

- The Commission may combine individual COLs for reactor modules of the same design into a single license
- However:
  - Term of single combined COL limited to 40 years from issuance of COL
  - Effective duration of design approval under single combined COL should be limited to 5 years
  - Not clear that single combined COL would confer all benefits anticipated by Exelon

Annual Fees

Glenda Jackson, Assistant for Fee Policy and Rules
Office of the Chief Financial Officer

Annual Fees

Two Major Laws Govern NRC Fees

- Independent Offices Appropriation Act (IOAA) (1952) - 10 CFR Part 170
  - Fees should recover agency's costs of providing any service or thing of value to identifiable recipients
  - Each charge should be fair and based on the costs of providing the service
  - Omnibus Budget Reconciliation Act of 1990 requires NRC to assess IOAA fees

Annual Fees

- Omnibus Budget Reconciliation Act (OBRA) and Amendment -10 CFR Part 171
  - Requires NRC to recover most of its budget authority through IOAA and annual fees (96 percent in FY 2002)
  - Annual fees are assessed to licensees to recover costs not recovered through IOAA fees
  - Aggregate amount of charges must be fairly and equitably allocated among licensees or classes of licensees
  - Annual fees should, to the maximum extent practicable, reasonably reflect the costs of providing services to the licensees or classes of licensees
  - Licensees who require greatest expenditure of NRC resources should pay the greatest annual charge

Annual Fees

Annual Fees for 10 CFR Part 52 Combined Licenses

- In the FY2002 Proposed Fee Rule, the NRC is proposing to revise 10 CFR Part 171 to:
  - Authorize assessment of annual fees to holders of combined licenses issued under 10 CFR Part 52
    - Assessment of the annual fees would begin only after construction has been completed, all regulatory requirements have been met, and the Commission has authorized operation of the reactor(s)
  - Clarify that annual fees are assessed for each license, and not for each unit
- The NRC is not at this time, proposing a specific annual fee category or amount for 10 CFR Part 52 combined licenses

Testing of New Design Features for Combined License

Jerry Wilson, Senior Policy Analyst
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Testing of New Design Features for Combined License

ISSUE:

- Should a combined license be issued before completion of all testing necessary to demonstrate performance of safety features?

Testing of New Design Features for Combined License

PRELIMINARY STAFF POSITION:

- Commission policy requires proof-of-performance testing for advanced reactors
- 10 CFR Part 52 requires qualification testing for certification of standard designs
- Draft rule language for 10 CFR Part 52 would require qualification testing for custom plant designs

Environmental Impacts of Fuel Cycle and Transportation

Dennis Allison
Office of Nuclear Reactor Regulation

Environmental Impacts of Fuel Cycle and Transportation

ISSUE:

- Tables S-3 and S-4 (10 CFR 51.51 & 51.52) specify the environmental impacts attributable to the fuel cycle and transportation for light water reactors (LWRs) but not for other types of reactors

Environmental Impacts of Fuel Cycle and Transportation

EXELON PROPOSALS:

- Exelon will address the environmental impacts attributable to the fuel cycle and transportation for a PBMR in the first PBMR application
- Based on the resolution of these issues for the first PBMR application, the NRC should initiate rulemaking to create tables for the PBMR that are similar to Tables S-3 and S-4

Environmental Impacts of Fuel Cycle and Transportation

PRELIMINARY STAFF POSITION:

- As Exelon has proposed, it is currently necessary to review PBMR environmental impacts attributable to the fuel cycle and transportation on an application-specific basis
- However, it is premature to decide on Exelon's proposal that the NRC initiate rulemaking to specify PBMR environmental impacts attributable to the fuel cycle and transportation on a generic basis

NOTE: Aside from PBMR considerations, the staff has identified a need to update the environmental effects of LWRs specified in Tables S-3 and S-4

Fuel Cycle Impacts - Waste Confidence

Tim Harris, Project Manager
Office of Nuclear Materials Safety and Safeguards

Fuel Cycle Impacts -Waste Confidence

ISSUE:

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

Fuel Cycle Impacts - Waste Confidence

NRC's Waste Confidence Rule codified in 10 CFR 51.23

- Generic determination that spent nuclear fuel (SNF) generated at reactor site could be safely stored without significant environmental impacts for at least 30 years beyond licensed life of reactor
- Reasonable assurance that at least one mined geologic repository would be available within the first quarter of the 21st century
- Sufficient capacity would be available within 30 years beyond reactor licensed life

Fuel Cycle Impacts - Waste Confidence

Waste Confidence Five Findings:

1. Safe disposal of radioactive waste and SNF in a mined geologic repository is technically feasible
2. One or more geologic repositories will be available within the 1st quarter of the 21st century and sufficient capacity will be available within 30 years beyond expiration of any reactor license to dispose of high level waste (HLW) & SNF
3. HLW & SNF will be managed safely until sufficient repository capacity is available to assure the safe disposal of all HLW & SNF
4. If necessary, 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
5. Safe independent onsite or offsite storage capacity will be available if needed

Fuel Cycle Impacts - Waste Confidence

Waste Confidence of SNF Storage Environmental Impacts

- No need to consider the environmental impacts of onsite storage of SNF (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 installation (ISFSI) licensing proceedings
- Environmental impacts during the term of the reactor operating license or a license for an ISFSI would be considered in a licensing proceeding

Fuel Cycle Impacts - Waste Confidence

EXELON'S POSITION:

- Waste Confidence Decision (WCD) applies to PBMR fuel
- WCD does not distinguish between types of fuel
- Commission considered non-LWR fuel in the WCD
- DOE is responsible for disposal of SNF

Fuel Cycle Impacts - Waste Confidence

PRELIMINARY STAFF POSITION:

- WCD finding 1, 2 & 5 apply to all reactor types
- WCD finding 3 primarily based on LWR fuel but did consider other fuels (e.g., Peach Bottom 1, Fort St. Vrain, Fermi 1, Rover Nuclear Rocket Program)
  - Original WCD discusses dry storage of non-LWR fuel
- WCD finding 4 considered that:
  - Material degradation process in dry storage well understood
  - Dry storage systems are simple, passive, and easily maintained
  - Dry cask storage experience has increased since original WCD
  - NRC maintains regulatory authority over SNF installation

Fuel Cycle Impacts - Waste Confidence

PRELIMINARY STAFF POSITION:

- It appears that a PBMR facility would be within the scope of the generic determination in 10 CFR 51.23(a)
- Exelon should enter into discussions with the Department of Energy (DOE), as appropriate, to confirm that DOE will accept PBMR SNF

Operator Staffing Requirements

Clare Goodman, Senior Human Factors Specialist
Office of Nuclear Reactor Regulation

Operator Staffing Requirements

ISSUE:

- 10 CFR 50.54(m) does not identify staffing requirements for sites with more than two units with a common control room
- Should a PBMR facility be allowed to control more than two reactors from one control room?
- Should a PBMR facility be allowed to operate with a control room staffing complement less than would be required for individual reactors?

Operator Staffing Requirements

EXELON PROPOSALS:

- Exelon will propose operator staffing requirements for three or more PBMR modules with a common control room as part of the first PBMR COL application and the PBMR design certification application and provide justification
- For operation of the first two PBMR modules, Exelon will request an exemption to the minimum staffing requirements in 10 CFR 50.54(m)
- For design certification, Exelon will specify operator staffing requirements and request an exemption to 10 CFR 50.54(m)

Operator Staffing Requirements

PRELIMINARY STAFF POSITION:

- The regulations do not address the possibility of having three or more reactors controlled from one control room
- The staff agrees that Exelon will need to address safety implications to justify operating more than two modules from one control room
- An exemption would be necessary for alternate level of staffing for PBMR
- Exelon must provide adequate justification for proposed staffing level

Operator Staffing Requirements

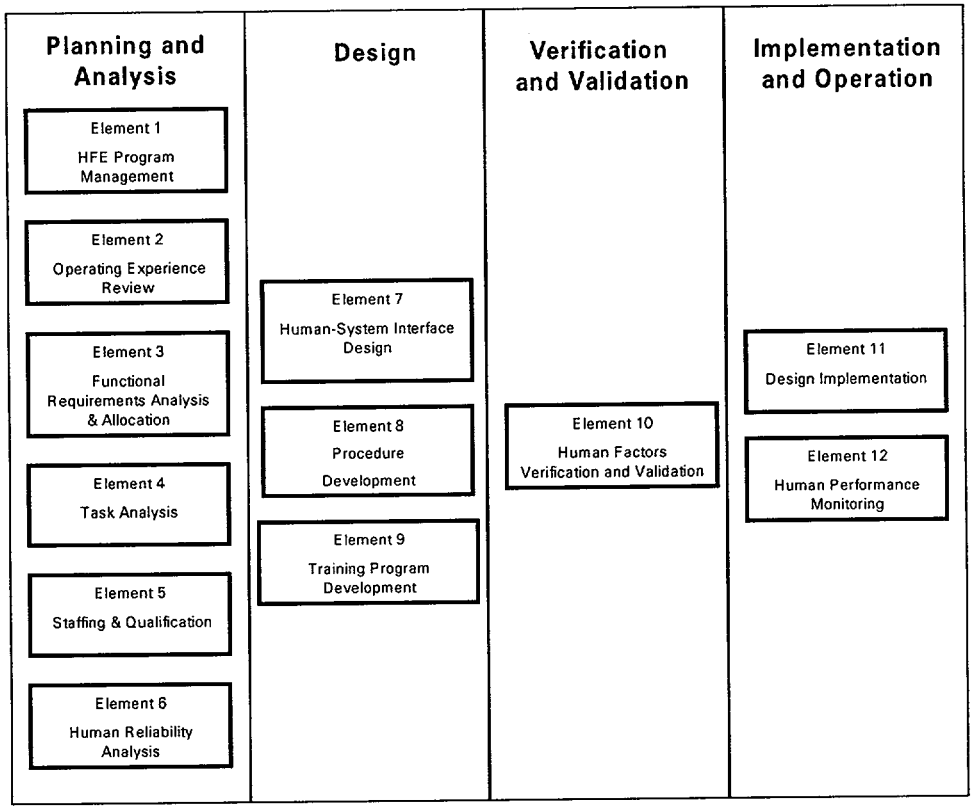
CONCEPT OF OPERATIONS:

- Role of the Operator
- Level of Automation
- Modes of Operation
- Multiple Module Control
- Control Room Design
- Refueling During Operation
- Personnel Categories and Qualifications
- Procedures

Operator Staffing Requirements

APPLICABILITY OF CURRENT RULES AND REGULATIONS:

- Part 55, Operators' Licenses
- Part 50.34(f), Additional TMI-related Requirements
- Part 50.54(k,m), Operator Staffing Requirements
- Reg Guide 1.114, Guidance to Operators at the Controls and to Senior Operators in the Control Room of a Nuclear Power Plant
- NUREG-0800, SRP Chapter 13, Conduct of Operations
- NUREG-0800, SRP Chapter 18, Human Factors Engineering
- NUREG-0711, Human Factors Engineering Program Review Model
- NUREG-0700, Human-System Interface Design Review Guideline



HFE Program Review Model Review Elements (NUREG-0711)

Financial Protection Requirements

Janice Moore, Assistant General Counsel
for Reactor Programs
Office of General Counsel

Financial Protection Requirements

ISSUE:

- Should Price Anderson financial protection requirements be applied to each modular reactor unit or to the entire PBMR "facility"?
- Price Anderson Act - contained in Section 170 of the AEA
- Price Anderson Act- implemented by 10 CFR Part 140
  - Financial protection requirements imposed on each nuclear reactor a licensee is authorized to operate (10 CFR 140.11)

Financial Protection Requirements

EXELON PROPOSAL:

- Exelon maintains that the NRC has the authority to grant an exemption from 10 CFR 140.11 for the first PBMR application to treat multiple modules at a site as a single nuclear facility for the purposes of the Price-Anderson Act
- Exelon proposes that rulemaking be initiated to provide that a multiple module facility is a single "facility" under the Price-Anderson financial protection requirements
- Exelon also proposes that rulemaking be initiated to amend the definition of utilization facility and nuclear reactor in 10 CFR 50.2 to include multiple reactor modules at a single site

Financial Protection Requirements

PRELIMINARY STAFF POSITION:

- There are substantial doubts that the Commission has the authority to treat multiple reactors as one facility for the purposes of the retroactive assessment

- Congress should amend the AEA if it seeks to assure that multiple modules at a single site are treated as one facility

NOTE: Legislation has been passed by the House (H.R. 2983) that would amend Section 170 to allow a combination of two or more modular reactors (each rated 100 -300 MWe) with a combined rated capacity of not more than 1300 MWe to be considered one facility. Legislation is under consideration by the Senate (S. 517) which contains the same provision

Antitrust Review Authority

Janice Moore, Assistant General Counsel
for Reactor Programs
Office of General Counsel

Antitrust Review Authority

- The NRC's antitrust review responsibilities are set forth in Section 105 of the Atomic Energy Act (AEA)
- 10 CFR 50.33a requires prospective applicants to submit antitrust review information to the NRC nine months prior to the application for a construction permit or combined license
- Exelon proposes that the NRC define a new category of merchant generating companies and exempt them from antitrust review
- Exelon also proposes that the NRC initiate rulemaking to clarify that merchant plants are not required to submit antitrust information
- The ability of the NRC to except certain applicants from the NRC's antitrust review requirements is being addressed separately by the Office of General Counsel

Financial Qualifications

Michael Dusaniwskyj, Financial Analyst
Office of Nuclear Reactor Regulation

Financial Qualifications

ISSUE:

- Section 182(a) of the Atomic Energy Act (AEA) requires license applications to include such information as financial qualifications as the Commission may specify by regulation
- 10 CFR 50.33(f) specifies the information sufficient to demonstrate financial qualifications
- Electric utilities applicants, as defined by 10 CFR 50.2, are not required to provide this information because financial qualifications have been established on a generic basis by rulemaking

Financial Qualifications

EXELON PROPOSAL:

- Exelon will submit financial qualifications information for the first PBMR application
- Exelon proposes that the NRC should exempt merchant generating companies from supplying financial qualifications information

Financial Qualifications

PRELIMINARY STAFF POSITION:

- 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
- The Commission has the authority to create a new class of applicants that would not be required to submit financial qualifications information
- Exelon has not provided sufficient information to support establishment of such a new class of applicants

Decommissioning Funding

Michael Dusaniwskyj, Financial Analyst
Office of Nuclear Reactor Regulation

Decommissioning Funding

ISSUE:

- 10 CFR 50.75 contains the requirements for providing decommissioning funding assurance. Utilities may use any of these six payment options:
  - Sinking Fund
  - Prepayment
  - Corporate Parent Guarantee
  - Surety Bonds
  - Contracts
  - Combination of the Foregoing Methods
- Non-utilities may not use the sinking fund method

Decommissioning Funding

EXELON PROPOSAL:

- At the time of the first PBMR application, Exelon wants to propose an alternative decommissioning funding method (a form of sinking fund)
- Exelon believes the NRC can grant an exemption to 10 CFR 50.75(e)(1) to permit this or another alternative funding approach
- Exelon proposes rulemaking be initiated to modify 10 CFR 50.75(e)(1) to authorize the use of an alternative funding method

Decommissioning Funding

PRELIMINARY STAFF POSITION:

- Exelon's current proposal is a form of a sinking fund
- Exelon's proposed payment scheme would not provide the same assurance of decommissioning funding as the other funding options
- 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

Decommissioning Cost Estimate

ISSUE:

- Decommissioning cost estimates in 10 CFR 50.75(c) are specific to light water reactors
- There is no formula in the regulations for the decommissioning cost estimate for gas-cooled reactors

Decommissioning Cost Estimate

EXELON PROPOSAL:

- Exelon proposes to include a PBMR specific decommissioning cost estimate in the first PBMR application
- Exelon proposes that the cost estimate apply to a single module since the construction of the modules may be staggered

Decommissioning Cost Estimate

PRELIMINARY STAFF POSITION:

- The staff could accept a site-specific decommissioning cost estimate provided there is adequate technical and financial justification
- The estimate should include the costs associated with decommissioning any common elements and structures of the facility