

## **RULEMAKING ISSUE NEGATIVE CONSENT**

October 25, 2002

SECY-02-0191

FOR: The Commissioners

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

SUBJECT: STATUS OF THE ENTOMBMENT OPTION FOR POWER REACTORS

PURPOSE:

To inform the Commission that the staff plans to defer rulemaking to permit entombment as an option for power reactors until completion of research studies on entombment viability issues (e.g., entombed structure performance, source term development and flow and transport modeling), unless directed otherwise by the Commission. This paper describes: (1) the staff's actions since publication of the Advance Notice of Proposed Rulemaking (ANPR) on entombment; (2) a summary of the comments received in response to publication of the ANPR; and (3) the staff's rationale for the recommendation.

BACKGROUND:

The Commission's decommissioning requirements for power reactors are contained in 10 CFR 50.82, which was published in 1988 (53 FR 24018, June 27, 1988). Section 50.82(a)(3) requires that decommissioning be completed within 60 years of permanent cessation of operations. The Commission may approve completion of decommissioning beyond 60 years if it determines that this is necessary to protect public health and safety. In making this determination, the Commission would consider the unavailability of waste disposal capacity and other site-specific factors affecting the licensee's capabilities to carry out decommissioning, including the presence of other nuclear facilities at the site. As noted in the "Supplementary Information" to the 1988 rule, the entombment alternative was not specifically precluded in the rule, because there could be instances in which entombment might be an allowable alternative in protecting public health and safety.

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In 1997, the Commission amended its regulations to establish dose criteria for license termination (62 FR 39058 July 21, 1997). These requirements are in Subpart E of 10 CFR Part 20 and include a provision that permits license termination under restricted-release conditions. Under these requirements, the dose to the average member of the critical group must not exceed 0.25 milliSievert/yr (25 millirem/yr) total effective dose equivalent (TEDE) and be as low as reasonably achievable (ALARA) with the restrictions in place. If the restrictions were no longer in effect, the dose due to residual radioactivity must not exceed 1 mSv/yr (100 mrem/yr) or 5 mSv/yr (500 mrem/yr) TEDE and be ALARA. These limits were chosen to provide a safety margin in the highly unlikely event that the restrictions failed.

In SECY-98-099, "Status Report of Staff Activities Related to Reviewing the Viability of Entombment as a Decommissioning Option for Power Reactors," dated May 4, 1998, the staff concluded that entombment appeared to be a viable decommissioning option. The staff provided information on the technical viability of entombment in SECY-99-187, "Information Paper on the Viability of Entombment as a Decommissioning Option for Power Reactors," dated July 19, 1999.

The U.S. Nuclear Regulatory Commission (NRC) held a workshop on December 14 and 15, 1999, to solicit stakeholder views on the technical bases, issues, and options for treating entombment equally with the other decommissioning alternatives. Findings from the workshop were transmitted to the Commission in SECY-00-0129, "Workshop Findings on the Entombment Option for Decommissioning Power Reactors and Staff Recommendations on Further Activities," dated June 22, 2000. In a Staff Requirements Memorandum (SRM) for SECY-00-0129, dated July 20, 2000, and revised on September 5, 2000, the Commission directed the staff to develop a rulemaking plan to address the entombment option for power reactors.

In SECY-01-0099, "Rulemaking Plan and Advance Notice of Proposed Rulemaking: Entombment for Power Reactors," dated June 1, 2001, the staff provided the Commission with a rulemaking plan and an ANPR. The rulemaking plan contained three options. Option 1 was to not conduct rulemaking and maintain the status quo, and handle entombment requests on a case-by-case basis. Option 2 was to conduct rulemaking amending 10 CFR 50.82 to increase the time frame for completion of decommissioning beyond 60 years, and to clarify the use of engineered barriers for reactor entombments.<sup>1</sup> Option 3 was to conduct rulemaking to establish a new regulation containing performance objectives and licensing requirements for entombed facilities as a disposal option useable by all NRC licensees. The disposal facility would be maintained under an NRC license and would permit termination of the Part 50 license.

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<sup>1</sup>Under 10 CFR Part 20, Subpart E, engineered barriers may or may not be considered institutional controls depending on the need for, and the degree of, human involvement required to maintain their effectiveness. Option 2, unlike Option 1, would clarify this issue.

The ANPR was published in the Federal Register on October 16, 2001, and solicited stakeholder input in five areas which can be summarized as follows:

1. Whether the existing NRC regulations were adequate to support entombment, and if not, what changes were needed to support entombment;
2. What the views were on the criteria and capability needed for credible engineering barriers used in an entombed facility;
3. What the views were on whether greater than class C waste (GTCC) should or should not be included in an entombed facility;
4. What the role of the Agreement States should be regarding an entombed facility; and
5. Whether licensees would take advantage of the entombment option, and if so, when they would do so.

#### DISCUSSION:

The ANPR comment period closed on December 31, 2001. NRC received 19 comments from: six States; eight licensees; the Nuclear Energy Institute (NEI); the U.S. Environmental Protection Agency (EPA); the Conference of Radiation Control Program Directors' E-24 Committee on Decommissioning and Decontamination (CRCPD E-24 Committee); the Southeast Compact Commission (SCC); and a private individual.

Generally, the eight utilities and NEI stated that they would like to have entombment available as a decommissioning option; however, none unequivocally committed to using entombment in their decommissioning process. Some utilities noted that their decommissioning choices would be based on cost and availability of low level waste (LLW) disposal sites. Some licensees noted that although increasing the period for decommissioning beyond the current 60-year time limit would provide them more flexibility, they believed that Part 20 provided the necessary regulatory guidance for an entombed facility. Two states, New York and Illinois, opposed any rulemaking that would specifically provide for entombment. Some licensees also stated a preference for NRC oversight for entombed facilities, with no State involvement or co-regulation.

Some Agreement State commenters also endorsed the Part 20 dose limits, with one State adding that a time limit to reach the dose rates should be considered. One State advocated extending the decommissioning period beyond 60 years, but most were silent on the decommissioning regulations in Part 50.

EPA observed that NRC's 1988 Generic Environmental Impact Statement dismissed entombment as not viable because of concerns about structural integrity over time. Although EPA did not endorse any of the three options, it expressed concern about the isolation of non-NRC-licensed contaminants, and their potential impact on the environment, and recommended that entombment be considered an option of last resort.

The CRCPD E-24 Committee also did not endorse any of the three options. It stated that each decommissioning situation was unique and that NRC should seek an opinion from each State separately.

SCC generally supported the concept of entombment but noted that entombing power reactors might have an adverse economic impact on LLW compact disposal sites. This, in turn, could limit the ability of other LLW generators in the compact to dispose of their radioactive waste. Views on the disposition of GTCC waste varied. Although no clear consensus was identified, a majority of commenters suggested excluding GTCC waste from entombment since the U.S. Government has the legislative responsibility for disposal of GTCC waste. New York reported that storage of GTCC is prohibited in its State by law.

Commenters generally agreed that NRC should more clearly define the performance criteria and technical capabilities of engineered barriers, to support an entombed facility, whether the regulations were revised or not. A more detailed summary of the comments received in response to the ANPR is contained in the Attachment.

The staff notes that there was no consensus on a preferred option. Commenters raised a number of technical issues, as well as the issue of whether DOE would be disposing GTCC, that need resolution before entombment is pursued. No commenter unequivocally committed to using the option if NRC made it available. In addition, the Electric Power Research Institute (EPRI) is currently evaluating storage issues related to GTCC waste; issues being considered include, but are not limited to doses from reactor internal components. EPRI expects the results of these analyses to be available in FY 2003. NRC staff believe that this information could be of great benefit.

Although 10 CFR 50.82 does not explicitly permit entombment, it does not preclude it. A licensee wishing to pursue entombment could do so under existing regulations. At present, the Office of Nuclear Regulatory Research (RES) is working to evaluate entombed structure performance over long periods of time. This work is scheduled for completion in 2005.

#### CONCLUSION:

Given the number and content of the comments on the ANPR, the fact that no licensee has unequivocally committed to pursuing entombment in the foreseeable future, the apparent issues regarding GTCC waste, and the current NRC priorities, the staff plans to defer further action on rulemaking to address entombment. The staff believes that it would be prudent to have RES complete its research to develop the technical basis before further rulemaking activity continues. By that time, the results of EPRI's evaluation of GTCC waste should also be available. The staff will continue to develop the technical bases for entombment and to discuss entombment as a decommissioning option with NRC stakeholders through industry-sponsored conferences.

In addition, the staff notes that NMSS is currently pursuing a number of high-priority initiatives. Examples include, but are not limited to: support for the Office of Nuclear Safety and Incident Response in security and safeguard initiatives and licensing of a mixed oxide fuel fabrication facility which will be significant to the nation's non-proliferation interests. As noted in

SECY-01-0099, Option 2 would require approximately three full-time equivalents (FTE) over two years to develop a final rule. The staff believes that these FTEs could be better used on higher priority initiatives.

AGREEMENT STATE COORDINATION:

A draft of this Commission paper was provided to the Agreement States for review and comment on August 28, 2002. No comments opposing the NRC's proposed action were received.

As previously noted, NRC had requested input from stakeholders on options related to entombment through an ANPR. As noted in the attachment, a number of Agreement States stated opposition to the option of entombment for a variety of reasons.

COORDINATION:

The staff briefed the Advisory Committee on Nuclear Waste (ACNW) on the staff recommendations on June 19, 2002. ACNW did not identify any concerns with the staff's proposed approach. The Office of the General Counsel has no legal objection to the content of this paper. The Office of the Chief Financial Officer has reviewed this Commission Paper for resource implications and also has no objections.

RECOMMENDATION:

Unless otherwise directed by the Commission within 10 days, the staff plans to defer further action on rulemaking to address entombment. Action will not be taken until the SRM is received. We consider this action to be within the delegated authority of the EDO.

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Executive Director  
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Attachment: "Staff Analysis of Advance Notice of Proposed Rulemaking Comments For Entombment of Power Reactors"

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