

## **POLICY ISSUE INFORMATION**

December 22, 2011

SECY-11-0181

FOR: The Commissioners

FROM: Michael R. Johnson, Director  
Office of New Reactors

SUBJECT: DECOMMISSIONING FUNDING ASSURANCE FOR SMALL MODULAR  
NUCLEAR REACTORS

### PURPOSE:

The purpose of this paper is to inform the Commission of the U.S. Nuclear Regulatory Commission (NRC) staff's plans for ensuring that small modular nuclear reactor (SMR) licensees provide reasonable assurance that funding will be available for decommissioning SMRs. This paper does not address any new commitments or resource implications.

### BACKGROUND:

As discussed in SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," dated March 28, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML093290245), the NRC staff has engaged in public preapplication activities with the U.S. Department of Energy, SMR designers, potential applicants, representatives of the nuclear industry, and other stakeholders to discuss potential policy, licensing, and key technical issues for SMR designs. One issue identified in SECY-10-0034 is the application of current decommissioning funding assurance (DFA) requirements to SMRs.

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Title 10 of the *Code of Federal Regulations* (10 CFR) 50.75, "Reporting and Recordkeeping for Decommissioning Planning," and 10 CFR 50.33(k) establish the requirements for indicating to the NRC how a licensee will provide reasonable assurance that funds will be available for the decommissioning process. The table in 10 CFR 50.75(c)(1) provides the minimum amount required to demonstrate reasonable assurance of funds for decommissioning based on the reactor type (for a pressurized-water reactor or a boiling-water reactor) in 1986 dollars, subject to the adjustment factor in 10 CFR 50.75(c)(2). All nuclear reactors that have a thermal power rating of 1,200 megawatts thermal (MWt) or less must have at least the amount of DFA required for a 1,200 MWt nuclear reactor. Existing regulations and associated guidance, such as Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," and NUREG-1713, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors," issued December 2004, on this subject are oriented towards large light-water reactor (LWR) facilities. SMR features, such as fuel design, thermal output, and facility footprint size, are likely to differ from those of large LWRs, and the decommissioning costs for SMR designs may also be different.

At this time, the Commission's regulations do not provide specific decommissioning cost estimate formulas for SMR designs. However, the regulations do allow the use of a site-specific estimate instead of the amount calculated through a generic formula for large pressurized-water and boiling-water reactors, as long as the site-specific estimate is equal to or greater than the amount of the generic formula.

In SECY-02-0180, "Legal and Financial Policy Issues Associated with Licensing New Nuclear Power Plants," dated October 7, 2002 (ADAMS Accession No. ML023600088), the NRC staff informed the Commission of its position on minimum decommissioning cost estimates stating that a non-LWR applicant would be able to use an adequately justified site-specific estimate for decommissioning costs. In the same paper, the NRC staff stated that for a modular facility, the applicant could submit a decommissioning cost estimate based on the decommissioning of one module, which can then be applied multiple times for the facility in question, with modifications as necessary, or (alternatively) it could submit a cost estimate based on the decommissioning of multiple modules at a single location. As discussed in SECY-10-0034, the staff believes that it may also be appropriate for integral pressurized-water reactor applicants to submit design-specific decommissioning cost estimates, as long as they provide adequate justification.

The NRC staff held several public workshops in 2010 and 2011 to discuss SMR DFA and has received the Nuclear Energy Institute (NEI) position paper titled, "Decommissioning Funding for Small Reactors," dated November 2, 2010 (ADAMS Accession No. ML103070098), which recommends that an applicant seeking an operating license or combined license for an SMR request an exemption from the requirements in 10 CFR 50.75 and propose a facility-specific plan. In the paper, NEI proposes that SMR applicants develop design-specific decommissioning funding estimates in accordance with the guidance in Regulatory Guide 1.159, which also describes the funding mechanisms available to applicants and licensees for DFA. Regardless of the method used, under current regulations, to obtain permission to use a site specific estimate less than the mandatory minimum in 10 CFR 50.75, an applicant would have to request and technically justify an exemption from the regulation.

DISCUSSION:

The staff expects to use a near-term and long-term approach to address DFA requirements for SMRs, including both non-LWRs and integral pressurized-water reactors. In the near-term, applicants can request an exemption, pursuant to 10 CFR 50.12, "Specific Exemptions," from the current DFA requirements in 10 CFR 50.75. The staff intends to apply current guidance, as appropriate, in the review of SMR designers' decommissioning cost estimates, and to continue interactions with industry representatives. The decommissioning cost estimates will be required to be fully justified and supported. In the long-term, the staff will implement lessons learned from the exemption process and, if warranted, will propose revisions to the regulations and associated guidance to address specific DFA requirements for SMRs. A more detailed discussion of both approaches follows.

Near-Term Approach: Allow Small Modular Reactors to Deviate from Existing Regulations Through Exemption Requests

Although Regulatory Guide 1.159 and NUREG-1713 provide a general framework and guidance for conducting these reviews, the staff expects the reviews of design-specific decommissioning cost estimates and related exemption requests to be challenging for SMR designs because of the differences between the SMR designs and previously licensed reactor designs, such as the following:

- reduced size and quantity of components and equipment to be disposed
- reduced area to be decontaminated (depending on the number of modules)
- possible difficulty with accessibility for decontamination because of the small size of the components
- possible difficulties related to the decommissioning of modules while other modules are in operation

The less complex features and modular nature of SMRs should make disassembly easier, because the components could be removed in the reverse order in which they were assembled. These differences between SMRs and large LWRs are expected to result in a number of differences in the cost of decommissioning a nuclear facility.

In addition to the challenges arising from differences between SMRs and large LWRs, NEI identified implementation issues related to timing the additions and withdrawals from decommissioning funds to address the probable differences in the commencement and termination of operation for modules at a multimodule facility. The staff has also identified several potential issues, such as fund depletion issues that arise from decommissioning and the simultaneous decommissioning and construction of modules, the designation of funds applicable to each module, and decommissioning that exceeds the 60-year limit. The applicant will also need to include in its estimate the cost of decommissioning common elements and structures associated with the facility and the costs of decommissioning each reactor module. The staff will consider these and other issues that may be identified before or during its review of any exemption requests.

The staff expects each exemption request to be unique because the request will reflect the specific demands and capabilities of the design for which it is being made. As the staff receives more information about these designs, it will continue efforts to identify differences in SMR designs that could affect DFA requirements. Additionally, 10 CFR 50.75(f)(5) states that, if necessary, licensees that use a decommissioning cost estimate must include in that estimate plans for adjusting levels of funds assured for decommissioning to demonstrate that a reasonable level of assurance will be provided and that funds will be available when needed to cover the cost of decommissioning.

Long-Term Approach: Propose Rulemaking to Change Decommissioning Funding Assurance Requirements for Small Modular Reactors

Updating the NRC's DFA requirements through rulemaking will ensure that, the NRC staff does not regulate new designs through exemption but rather through a stable and predictable regulatory structure. Working through a limited number of exemption requests, along with stakeholder engagement, will ensure the staff is prepared to make an informed proposal to the Commission for changes to regulations and associated guidance.

COORDINATION:

This paper has been coordinated with the Office of Nuclear Reactor Regulation. The Office of the General Counsel reviewed this paper and has no legal objection.

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**SECY-012**

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