NUCLEAR REGULATORY COMMISSION

10 CFR Part 51

[NRC–2012–0246]

RIN 3150–AJ20

Waste Confidence—Continued Storage of Spent Nuclear Fuel

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) proposes revising its generic determination on the environmental impacts of the continued storage of spent nuclear fuel beyond a reactor's licensed life for operation and prior to ultimate disposal. The NRC has prepared a draft generic environmental impact statement to support this proposed rule. The Commission proposes to conclude that the analysis generically addresses the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor and supports the determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. The proposed rule also would clarify that the generic determination applies to a license renewal for an independent spent fuel storage installation (ISFSI). In addition, the proposed rule would make conforming amendments to the Commission's 2013 findings on the environmental effects of renewing the operating license of a nuclear power plant to address issues related to the storage of spent nuclear fuel after a reactor's licensed life for operation and the offsite radiological impacts of spent nuclear fuel and high-level waste disposal.

DATES: Submit comments on the proposed rule by November 27, 2013. Comments received after this date will be considered if it is practical to do so, but the NRC is able to assure consideration only for comments received on or before this date.

ADDRESSES: You may submit comments related to this proposed rule by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- *Federal rulemaking Web site:* Go to *http://www.regulations.gov* and search for Docket ID NRC–2012–0246. Address questions about NRC dockets to Carol Gallagher; telephone: 301–287–3422; email: *Carol.Gallagher@nrc.gov.* For technical questions, contact the individuals listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.
- *Email comments to: Rulemaking.Comments@nrc.gov.* If you do not receive an automatic email reply confirming receipt, then contact us at 301–415–1677.
- *Fax comments to:* Secretary, U.S. Nuclear Regulatory Commission at 301–415–1101.
- *Mail comments to:* Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, ATTN: Rulemakings and Adjudications Staff.
- *Hand deliver comments to:* 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. (Eastern Time) Federal workdays; telephone: 301–415–1677.

For additional direction on accessing information and submitting comments, see ''Accessing Information and Submitting Comments'' in the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: Merri Horn, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; telephone: 301–287–9167; email: *Merri.Horn@nrc.gov;* or Timothy McCartin, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; telephone: 301–287–9259; email: *Timothy.McCartin@nrc.gov.*

SUPPLEMENTARY INFORMATION:

Executive Summary

Purpose of the Regulatory Action

The purpose of this proposed rule is to improve the efficiency of the NRC's licensing process by adopting into the NRC's regulations an analysis of the generic environmental impacts of the continued storage of spent nuclear fuel beyond the licensed life for operations of a reactor (continued storage). The NRC has prepared a draft generic environmental impact statement of the environmental impacts of continued storage, which provides a regulatory basis for the rule. This proposed rule would codify the results of the analyses from the generic environmental impact statement in § 51.23 of Title 10 of the *Code of Federal Regulations* (10 CFR), ''Temporary storage of spent nuclear fuel after cessation of reactor operation-generic determination of no significant environmental impact.'' The NRC's licensing proceedings for nuclear reactors and ISFSIs have historically relied upon the generic determination in 10 CFR 51.23 to satisfy the agency's obligations under the National Environmental Policy Act (NEPA) with respect to the narrow area of the environmental impacts of continued storage. If this proposed rule is adopted as a final rule, the NEPA analyses for future reactor and spent-fuel-storage facility licensing actions would not need to consider the environmental impacts of continued storage on a site specific basis.

Summary of the Major Rule Changes

The major proposed changes to the rule are summarized as follows:

- The title of 10 CFR 51.23 would be revised to ''Environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor.''
- Paragraph (a) of 10 CFR 51.23 would be revised to provide the Commission's generic determination on continued storage of spent nuclear fuel. The proposed amendments would state that the Commission has concluded that the analysis in NUREG–2157, ''Waste Confidence Generic Environmental Impact Statement'' (DGEIS) generically supports the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor and supports the Commission's determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor.
- Paragraph (b) of 10 CFR 51.23 would be revised to clarify that license renewals for an ISFSI are included in the scope of the generic determination.
- Conforming changes would be made to 10 CFR 51.61, 51.80(b), and 51.97(a) to clarify that ISFSI license renewals are included in the scope of the generic determination.
- The ''Offsite radiological impacts of spent nuclear fuel and high-level waste disposal'' issue would be reclassified as a Category 1 impact in Table B–1 of appendix B of 10 CFR part 51, ''Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants,'' and the finding column entry would be revised to address continued storage.
- The finding column entry for the ''Onsite storage of spent nuclear fuel'' issue'' in Table B–1 appendix B of subpart A of 10 CFR part 51 would be revised to include the period of continued storage beyond the licensed life for operation of a reactor.

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I. Accessing Information and Submitting Comments

A. Accessing Information

Please refer to Docket ID NRC–2012–0246 when contacting the NRC about the availability of information for this proposed rule. You may access information related to this proposed rule, which the NRC possesses and is publicly-available, by any of the following methods:

- *Federal Rulemaking Web site:* Go to *http://www.regulations.gov* and search for Docket ID NRC–2012–0246.
- *NRC's Agencywide Documents Access and Management System (ADAMS):* You may access publicly-available documents online in the NRC Library at *http://www.nrc.gov/reading-rm/adams.html.* To begin the search, select ''ADAMS Public Documents'' and then select ''*Begin Web-based ADAMS Search.*'' For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1–800–397–4209, 301–415–4737, or by email to *pdr.resource@nrc.gov.* The ADAMS accession number for each document referenced in this proposed rule (if that document is available in ADAMS) is provided the first time that a document is referenced. In addition, for the convenience of the reader, the ADAMS accession numbers are provided in a table in Section VI, *Availability of Documents,* of this document.
- *NRC's PDR:* You may examine and purchase copies of public documents at the NRC's PDR, Room O1–F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID NRC–2012–0246 in the subject line of your comment submission, in order to ensure that the NRC is able to make your comment submission available to the public in this docket.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at *http://www.regulations.gov* as well as enter the comment submissions into ADAMS and the NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission.

Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Background

In the late 1970s, a number of environmental groups and States challenged the NRC regarding issues related to the storage and disposal of spent nuclear fuel beyond a reactor's licensed life for operation. In 1977, the Commission denied a petition for rulemaking (PRM), PRM–50–18, filed by the Natural Resources Defense Council (NRDC) that asked the NRC to determine whether radioactive wastes generated in nuclear power reactors can be disposed of without undue risk to public health and safety and to refrain from granting pending or future requests for reactor operating licenses until the NRC made such a determination. The Commission stated in its denial that, as a matter of policy, it ''. . . would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely'' (42 FR 34391, 34393; July 5, 1977, *pet. for rev. dismissed sub nom., NRDC* v. *NRC,* 582 F.2d 166 (2d Cir. 1978)).

At about the same time, interested parties challenged license amendments that permitted expansion of the capacity of spent fuel pools at two nuclear power plants, Vermont Yankee and Prairie Island. In 1979, the U.S. Court of Appeals for the District of Columbia Circuit, in *Minnesota* v. *NRC,* 602 F.2d 412 (D.C. Cir. 1979), did not stay or vacate the license amendments, but did remand to the Commission the question of whether an offsite storage or disposal solution would be available for the spent nuclear fuel at the two facilities at the expiration of their licenses—at that time scheduled for 2007 and 2009—and, if not, whether the spent nuclear fuel could be stored safely at those reactor sites until an offsite solution became available.

In 1979, the NRC initiated a generic rulemaking proceeding that stemmed from these challenges and the Court's remand in *Minnesota* v. *NRC.* The purpose of the Waste Confidence rulemaking was to generically assess whether the Commission could have reasonable assurance that radioactive wastes produced by nuclear power plants ''can be safely disposed of, to determine when such disposal or offsite storage will be available, and to determine whether radioactive wastes can be safely stored onsite past the expiration of existing facility licenses until offsite disposal or storage is available'' (44 FR 61372, 61373; October 25, 1979). On August 31, 1984, the Commission published the Waste Confidence Decision (Decision) (49 FR 34658) and a final rule (49 FR 34688), codified at 10 CFR 51.23. This Decision provided an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) to support the rule. In the 1984 Decision the Commission made five Findings:

1. The Commission finds reasonable assurance that safe disposal of radioactive waste and spent nuclear fuel in a mined geologic repository is technically feasible;

2. The Commission finds reasonable assurance that one or more mined geologic repositories for commercial high-level radioactive waste and spent nuclear fuel will be available by the years 2007–2009 [1] and that sufficient repository capacity will be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial high-level radioactive waste and spent nuclear fuel originating in such reactor and generated up to that time;

3. The Commission finds reasonable assurance that high-level radioactive waste and spent nuclear fuel will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all high-level radioactive waste and spent nuclear fuel;

4. The Commission finds reasonable assurance that, if necessary, spent nuclear fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin or at either onsite or offsite ISFSIs; and

5. The Commission finds reasonable assurance that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed.

The rule, 10 CFR 51.23, codified the analysis in the Decision and found that for at least 30 years beyond the expiration of a reactor operating license, no significant environmental impacts will result from the storage of spent nuclear fuel and expressed the Commission's reasonable assurance that a repository was likely to be available by 2007–2009. The rule also stated that, as a result of this generic determination, the agency did not need to assess the site-specific impacts of continuing to store the spent nuclear fuel in either an onsite or offsite storage facility in new reactor licensing environmental impact statements (EIS) or EAs beyond the expiration dates of reactor licenses (10 CFR 51.23(b)). The rule also amended 10 CFR part 50, ''Domestic licensing of production and utilization facilities,'' to require operating nuclear power reactor licensees to submit their plans for managing spent nuclear fuel at their site until the fuel is transferred to the U.S. Department of Energy (DOE) for disposal (see 10 CFR 50.54(bb)).

The Commission conducted its first review of the Decision and rule in 1989–1990. This review resulted in the revision of the second and fourth Findings to reflect revised expectations for the date of availability of the first repository, and to clarify that the expiration of a reactor's licensed life for operation referred to the full 40-year initial license for operation and any additional term of a revised or renewed license. On September 18, 1990, the Commission published the revised Decision (55 FR 38474) and the associated final rule (55 FR 38472). The revised Findings 2 and 4 in the 1990 revised Decision were:

Finding 2: The Commission finds 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 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level radioactive waste and spent nuclear fuel originating in such reactor and generated up until that time.

Finding 4: The Commission finds reasonable assurance that, if necessary, spent nuclear fuel generated at 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 ISFSIs.

The Commission also amended 10 CFR 51.23(a) to reflect the revised timing of the availability of a geologic repository to the first quarter of the twenty-first century. The rule was also revised to reflect that the licensed life for operation may include the term of a revised or renewed license.

The Commission conducted its second review of the Decision and rule

[1] Under the court remand that precipitated the initial waste confidence review, the NRC was required to consider whether there was reasonable assurance that an offsite storage solution would be available by the years 2007–2009 and, if not, whether there was reasonable assurance that the spent fuel could be stored safely at those sites beyond those dates. *See State of Minnesota* v. *NRC,* 602 F.2d 412, 418 (D.C. Cir. 1979).

in 1999 and concluded that experience and developments after 1990 had confirmed the Findings and made a comprehensive reevaluation of the Decision and rule unnecessary (64 FR 68005; December 6, 1999).

In 2008, the Commission decided to conduct its third review of the Decision and rule as part of an effort to enhance the efficiency of upcoming combined operating license application proceedings. The Commission determined that it would be more efficient to resolve certain combined-license-proceeding issues generically, including those related to Waste Confidence. This review resulted in a revision of the second and fourth Findings to reflect revised expectations for the date of availability of the first repository and that spent nuclear fuel can be stored safely for at least 60 years beyond the licensed life for operation.

In December 2010, the Commission published its revised Decision (75 FR 81032; December 23, 2010) and associated final rule (75 FR 81037; December 23, 2010). The revised Findings 2 and 4 in the 2010 Decision were:

Finding 2: The Commission finds reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent nuclear fuel generated by any reactor when necessary.

Finding 4: The Commission finds reasonable assurance that, if necessary, spent nuclear fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 60 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and either onsite or offsite ISFSIs.

Section 51.23(a) of 10 CFR was amended to reflect revised Findings 2 and 4. The changes reflected that spent nuclear fuel could be safely stored for at least 60 years beyond the licensed life for operation of a reactor and that sufficient mined geologic repository capacity would be available when necessary.

In response to the 2010 Decision and rule, the States of New York, New Jersey, Connecticut, and Vermont; several public interest groups; and the Prairie Island Indian Community filed a lawsuit in the U.S. Court of Appeals for the District of Columbia Circuit that challenged the Commission's compliance with NEPA. On June 8, 2012, the Court ruled that some aspects of the 2010 Decision did not satisfy the NRC's NEPA obligations and vacated and remanded the Decision and rule (*New York* v. *NRC,* 681 F.3d 471 (D.C. Cir. 2012) [2]). The Court concluded that the Waste Confidence rulemaking is a major federal action necessitating either an EIS or an EA that results in a FONSI. In vacating the 2010 Decision and rule, the Court identified three specific deficiencies in the analysis:

1. Related to the Commission's conclusion that permanent disposal will be available ''when necessary,'' the Court held that the Commission needed to include an evaluation of the environmental effects of failing to secure permanent disposal since there was a degree of uncertainty regarding whether a repository would be built;

2. Related to continued storage of spent nuclear fuel, the Court concluded that the Commission had not adequately examined the risk of spent fuel pool leaks in a forward-looking fashion; and

3. Also related to the continued storage of spent nuclear fuel, the Court concluded that the Commission had not adequately examined the consequences of potential spent fuel pool fires.

In response to the Court's decision, on August 7, 2012, the Commission stated in Commission Order CLI–12–16 (ADAMS Accession No. ML12220A094) that it would not issue reactor or ISFSI licenses dependent upon the Waste Confidence Decision and rule until the Court's remand is appropriately addressed. The Commission stated, however, that this determination extends only to final license issuance and that all licensing reviews and proceedings should continue to move forward.

In the September 6, 2012, Staff Requirements Memorandum, ''Staff Requirements—COMSECY–12–0016—Approach for Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule'' (ADAMS Accession No. ML12250A032), the Commission directed the staff to develop a generic EIS to support an updated Waste Confidence Decision and rule. In response, the NRC formed the Waste Confidence Directorate in the Office of Nuclear Material Safety and Safeguards (NMSS) to oversee the development of the generic EIS and an update that would replace the previous Waste Confidence Decision and rule. The NRC began the environmental review process by publishing a Notice of Intent to prepare an EIS and conduct scoping (77 FR 65137; October 25, 2012). The NRC held one public meeting with a live Webcast and one Webcast-only meeting in November 2012, and two Webinars in December 2012 to obtain public input on the scope of the environmental review.[3] The transcripts for each of these meetings are available in ADAMS under Accession Nos. ML12331A347, ML12331A353, ML12355A174, and ML12355A187, respectively. The scoping period ended on January 2, 2013. Starting in January 2013, the NRC Waste Confidence Directorate has held monthly public teleconferences to provide updates on the status of Waste Confidence activities.

The ''Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report,'' which is available in ADAMS under Accession No. ML13060A128, provides a summary of the determinations and conclusions reached during the NRC's environmental scoping process. The Summary Report also contains a summary of comments received during the public scoping period and the NRC's responses. A separate document, ''Scoping Comments on the Waste Confidence Generic Environmental Impact Statement,'' lists the scoping comments, organized by comment category (ADAMS Accession No. ML13060A130). The NRC is issuing this proposed rule and the draft NUREG–2157, ''Waste Confidence Generic Environmental Impact Statement'' (DGEIS) (ADAMS Accession No. ML13224A106) for public comment.

III. Discussion

This discussion section has been divided into three subsections to better present information on the proposed rule and the Waste Confidence proceeding. Section A provides general information related to the Waste Confidence proceeding. Section B provides information related to the proposed rule changes. Sections A and B are in a question and answer format. Lastly, Section C ''Decision'' provides a discussion of the issues and conclusions addressed in the DGEIS that had previously appeared in the Findings discussions of prior Waste Confidence decisions.

A. General Information

A1. What action is the NRC taking?

The NRC is proposing to issue a rule to codify its generic determination on the environmental impacts of continued storage of spent nuclear fuel at, or away

[2] The Court's ruling is available at: *http://www.cadc.uscourts.gov/internet/opinions.nsf/57ACA94A8FFAD8AF85257A1700502AA4/$file/11-1045-1377720.pdf.*

[3] A Webcast is an Internet-based meeting that includes both audio and video feeds. A Webinar is an Internet-based meeting that does not include video.

from, reactor sites beyond a reactor's licensed life for operation. The analysis in the DGEIS provides a regulatory basis for the proposed rule.

A2. What is the Waste Confidence proceeding?

Historically, the Commission's Waste Confidence proceeding represented the Commission's generic determination and generic environmental analysis that spent nuclear fuel can be stored safely and without significant environmental impacts for a period of time past the licensed life for operation of a reactor. This generic environmental analysis was reflected in 10 CFR 51.23, which addresses the NRC's NEPA obligations with respect to the continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor but before ultimate disposal.

This proposed rule and the DGEIS represent a change in the format of the Commission's Waste Confidence proceeding. As discussed in more detail in Question A.12, because the Commission is preparing a DGEIS, which provides a detailed analysis of the environmental impacts associated with continued storage, it is no longer necessary to make a ''finding of no significant impact,'' as that term is used in NEPA, associated with continued storage. This proposed rule then codifies the environmental impacts reflected in the DGEIS.

A3. Why is the NRC doing this now?

On June 8, 2012, the U.S. Court of Appeals for the District of Columbia Circuit vacated the Commission's 2010 Waste Confidence rulemaking, and remanded the rulemaking to the NRC to address deficiencies related to the NRC's NEPA analysis. On September 6, 2012, the Commission instructed NRC staff to proceed with a generic EIS to analyze the environmental impacts of continued storage and address the issues raised in the Court's decision and to update the Waste Confidence rule in accordance with the analysis in the EIS. The DGEIS and this proposed rule implement the Commission's direction.

A4. Whom would this action affect?

This proposed rule would affect any nuclear power reactor applicant and licensee undergoing issuance or renewal of an operating license for a nuclear power reactor under 10 CFR parts 50 or 54, ''Requirements for renewal of operating licenses for nuclear power plants''; issuance of a combined license for a nuclear power reactor under 10 CFR part 52, ''Licenses, certifications, and approvals for nuclear power plants''; or some amendments of a license under 10 CFR parts 50 or 52. This proposed rule would also affect the issuance of an initial, amended, or renewed license for storage of spent nuclear fuel at an ISFSI under 10 CFR part 72, ''Licensing requirements for the independent storage of spent nuclear fuel, high-level radioactive waste, and reactor-related greater than Class C waste.'' The proposed rule could also affect participants in any proceeding addressing these licensing actions.

A5. Why is the NRC generically addressing the environmental impacts of continued storage?

Since 1984, the NRC has generically addressed the environmental impacts of continued storage though a generic NEPA analysis and rule. Without a generic environmental impact analysis, site-specific consideration of the environmental impacts of continued storage would be necessary. The NRC's proposed reliance on a GEIS and rule to address environmental impacts of continued storage of spent nuclear fuel will enhance the NRC's efficiency in individual licensing reviews by addressing a set of issues that are the same or largely similar or can be reasonably predicted based on a well understood range of operating experience at each power reactor or storage site and codifying them. The generic determination in 10 CFR 51.23 would satisfy the NRC's NEPA obligations with respect to the environmental impacts of continued storage.

A6. What types of waste are addressed by Waste Confidence?

The environmental analysis in the DGEIS and in this proposed rule covers low and high burn-up spent nuclear fuel generated in light-water nuclear power reactors. It also covers mixed oxide (MOX) fuel,[4] since the MOX fuel would be substantially similar to existing light-water reactor fuel and is, in fact, being considered for use in existing light-water reactors in the United States. It also covers spent nuclear fuel from small modular reactors. Small modular light-water reactors being developed will use fuel very similar in form and materials to the existing operating reactors and will not, therefore, introduce new technical challenges to the disposal of spent nuclear fuel. Waste Confidence also covers the spent nuclear fuel from one high-temperature gas-cooled reactor (HTGR) built and commercially operated: Fort Saint Vrain. The spent nuclear fuel from Peach Bottom Unit 1 is not covered because its fuel has been removed from the site and transferred to the control of DOE, and the fuel is no longer regulated by the NRC (*see* Section 2.1.1.3 of the DGEIS).

A7. What activities are not covered by the Waste Confidence DGEIS and proposed rule?

Waste Confidence does not consider transportation of spent nuclear fuel during reactor operation, disposal of spent nuclear fuel, or storage of spent nuclear fuel during the licensed life for operation of the power reactor. Additionally, Waste Confidence does not address foreign spent nuclear fuel, non-power reactor spent fuel (e.g., fuel from research and test reactors), defense waste, Greater-than-Class C low-level waste, reprocessing of commercial spent nuclear fuel, and the need for nuclear power.

The NRC is participating in pre-application reviews of the DOE's Next Generation Nuclear Plant (NGNP). The NGNP would use nuclear fuel comprised of Tristructural-Isotopic-coated fuel particles contained in either fuel pebbles or prismatic fuel assemblies. However, because this fuel type has not completed fuel qualification testing, continued storage of spent nuclear fuel from the NGNP program is not within the scope of the DGEIS and this proposed rule. Additionally, the continued storage of future HTGR spent nuclear fuels is not within the scope of the DGEIS or this proposed rule.

A8. How is spent nuclear fuel stored?

Spent nuclear fuel is stored in either spent fuel pools or in dry cask storage. Spent fuel pools are designed to store and cool the spent nuclear fuel following removal from the reactor. Spent fuel pools are massive, seismically-designed structures that are constructed from thick, reinforced concrete walls and slabs that vary between 0.7 and 3 meters (2 and 10 feet) thick. All spent fuel pools currently in operation are lined with stainless steel liners that vary in thickness between 6 and 13 millimeters (0.25 and 0.5 inches); spent fuel pools have either a leak detection system or administrative controls to monitor the spent fuel pool liner. Leak detection systems are usually made up of several channels that can be monitored individually or are designed in such a way that leakage empties into drains that can be monitored. Leaked water is directed to a sump, liquid radioactive waste treatment system, or

[4] Mixed oxide fuel (often called MOX fuel) is a type of nuclear reactor fuel that contains plutonium oxide mixed with either natural or depleted uranium oxide in ceramic pellet form.

other cleanup or collection systems. Racks fitted in the spent fuel pools store the fuel assemblies in a controlled configuration (*i.e.,* so that the fuel is both sub-critical and in a coolable geometry). Spent fuel pool systems also include redundant monitoring, cooling, and makeup-water systems. The spent nuclear fuel assemblies are positioned in racks at the bottom of the pool and are typically covered by at least 6 meters (20 feet) of water. The water in the pools provides radiation shielding, spent nuclear fuel assembly cooling, and captures radionuclides in case of fuel rod leaks. Spent fuel pools are located at reactor sites, typically within the fuel-handling building (pressurized-water reactor (PWR)) or the reactor building (boiling-water reactor). A typical spent fuel pool at a light water reactor holds (with full core reserve maintained) the equivalent of about 6 core loads, or about 700 metric tons uranium (MTU). There is one away-from-reactor spent fuel pool (General Electric-Hitachi (GEH)-Morris) licensed under 10 CFR part 72 as an ISFSI. Information on the spent fuel pools and the quantity of spent nuclear fuel that can be stored in spent fuel pools is available in Appendix G of the DGEIS (*see* also Chapter 2 of the DGEIS).

Spent nuclear fuel is also stored in dry casks at ISFSIs licensed by the NRC under either a general license or a specific license. Dry cask storage shields people and the environment from radiation and keeps the spent nuclear fuel inside dry and nonreactive. Dry cask storage allows spent fuel that has already been cooled in the spent fuel pool to be surrounded by inert gas inside a container called a cask. The casks are typically steel cylinders that are either welded or bolted closed. The steel cylinder provides a leak-tight confinement of the spent fuel. Each cylinder is surrounded by additional steel, concrete, or other material to provide radiation shielding to workers and members of the public. Dry cask storage systems are essentially passive systems that rely on natural air circulation for cooling during storage of the spent nuclear fuel, and are robust massive structures that are highly damage resistant. There are many different dry cask storage systems, but most fall into two main categories based on how they are loaded. The first is the bare fuel, or direct-load, casks in which spent nuclear fuel is loaded directly into a basket that is integrated into the cask. Bare fuel casks, which tend to be all metal construction, are generally bolted closed. The second is the canister-based system in which spent nuclear fuel is loaded into a basket inside a relatively thin-walled cylinder called a canister. The canister is usually loaded while inside a transfer cask and then welded and transferred vertically into either a concrete or metal storage overpack or horizontally into a concrete storage module. As of the end of 2012, ISFSIs were storing spent nuclear fuel in over 1,700 loaded dry casks. Information on the types of casks used to store spent nuclear fuel at each ISFSI is available in Appendix G of the DGEIS (*see* also Chapter 2 of the DGEIS).

A9. How can the NRC conduct a generic review when spent nuclear fuel is stored at specific sites? Why has a site-specific review not been conducted?

Historically, the Commission has chosen to generically address continued storage, and this approach was validated for appropriate circumstances by the D.C. Circuit Court of Appeals in the same decision that vacated and remanded the 2010 Waste Confidence Decision and rule. Although the environmental impacts of spent nuclear fuel storage during the licensed life for operation may be site specific, the impacts of continued storage may be assessed generically because:

(1) Continued storage will involve spent nuclear fuel storage facilities for which the environmental impacts of operation are sufficiently understood as a result of lessons learned and knowledge gained from operating experience.

(2) Activities associated with continued storage are expected to be within this well-understood range of operating experience; thus, environmental impacts can be reasonably predicted.

(3) Changes in the environment around spent nuclear fuel storage facilities are sufficiently gradual and predictable to be addressed generically.

In evaluating the environmental impacts of continued storage of spent nuclear fuel, the NRC used existing environmental evaluations to help inform the impact determinations in the DGEIS, such as NUREG–0586, ''Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities Supplement 1 Regarding the Decommissioning of Nuclear Power Reactors Main Report,'' (ADAMS Accession No. ML023500395) and NUREG–1437, ''Generic Environmental Impact Statement for License Renewal of Nuclear Plants'' Revision 1 (ADAMS Accession No. ML13106A241 for main volume 1, ML13106A242 for volume 2, and ML13106A244 for volume 3). The NRC also reviewed site-specific EISs and EAs for new and operating reactors, ISFSIs, and subsequent renewals. The NRC staff also looked to other sources of information, such as technical reports.

A10. Would the Waste Confidence rulemaking authorize the storage of spent nuclear fuel at the operating reactor site near me?

No, the Waste Confidence rule does not authorize the storage of spent nuclear fuel at any site. The Waste Confidence rule is a generic determination regarding the potential environmental impacts from the continued storage of spent nuclear fuel after the end of a reactor's licensed life for operation and before the spent nuclear fuel is placed in a repository. The rule reflects only the generic environmental analysis of the period of spent nuclear fuel storage beyond a reactor's licensed life for operation and before disposal in a repository. This proceeding is not a substitute for licensing actions that typically include site-specific NEPA analysis and site-specific safety analyses (*see* also question A11).

In addition, the NRC's DGEIS and proposed rule do not pre-approve any particular waste storage or disposal site technology, nor do they require that a specific cask design be used for storage. Individual licensees and applicants, including any applicant for a high-level radioactive waste repository, will have to apply for and receive a site-specific license from the NRC before storing or disposing of any spent nuclear fuel. Separately, every 10 CFR part 50 or part 52 nuclear power reactor licensee already holds a general license that authorizes storage of spent nuclear fuel in cask designs that are approved by the NRC.

A11. What environmental reviews would be precluded from a site-specific licensing action after the Waste Confidence rulemaking is complete?

The Waste Confidence rule will satisfy the NRC's NEPA obligations with respect to continued storage for initial, renewed, and amended licenses for reactors and ISFSIs. The environmental analysis that would accompany the initial license or license renewal of individual nuclear power reactors or the initial license or license renewal of an ISFSI would consider the potential environmental impacts of storage of spent nuclear fuel during the term of the license. What would not be considered in those proceedings—due to the generic determination in 10 CFR 51.23(a)—is the potential environmental impact of continued storage of spent nuclear fuel beyond the licensed life for

operation of the reactor. The NRC's regulations allow participants in the NRC's licensing proceedings to obtain a waiver of a rule if they show special circumstances why the rule should not apply to the specific proceeding (*see* 10 CFR 2.335(b)).

A12. Why is there not a separate Waste Confidence decision document?

Historically, the Waste Confidence Decision contained five ''Findings'' that addressed the technical feasibility of a mined geologic repository, the degree of assurance that disposal would be available by a certain time, and the degree of assurance that spent fuel and high-level waste could be managed safely without significant environmental impacts for a certain period beyond the expiration of plants' operating licenses. Preparation of and reliance upon a GEIS is a fundamental departure from the approach used in past Waste Confidence proceedings. The DGEIS acknowledges the uncertainties inherent in a prediction of repository availability and provides an environmental analysis of reasonably foreseeable timeframes. To this end, the DGEIS considers a number of possible timeframes for repository availability, including the impacts from never having a repository. Because a GEIS is being issued, findings are no longer necessary.

Section C, ''Decision,'' provides a discussion of the issues and conclusions addressed in the DGEIS that had previously appeared in the findings discussions of prior Waste Confidence decisions. To support the analysis in the DGEIS and the proposed rule, the underlying assumptions in the DGEIS address the issues assessed in the previous ''Five Findings'' as conclusions regarding the technical feasibility and availability of a repository and conclusions regarding the technical feasibility of safely storing spent fuel in an at-reactor or away-from-reactor storage facility. The GEIS will fulfill NRC's NEPA obligations for analyzing the environmental impacts of continued storage and the related uncertainties in repository availability.

A13. How can the NRC complete the environmental impact statement and rulemaking in 24 months?

The Waste Confidence proceeding is a high priority for the Commission. Following the remand by the Court of Appeals, the NRC formed a new organization, the Waste Confidence Directorate in the Office of Nuclear Material Safety and Safeguards, to develop the generic EIS and rule. In staffing the new Directorate, the NRC brought together a team consisting of many of the agency's most experienced and knowledgeable NEPA and rulemaking practitioners. The Directorate is focused on Waste Confidence. These focused NRC staff resources have enabled the NRC to conduct the hard look required by NEPA and optimize public participation in the process. The resources and expertise being devoted to the waste confidence proceeding and the schedule for public comment support completion within 24 months.

A14. What is the status of the extended storage effort?

The extended storage effort focuses on technical and regulatory considerations for continued effective regulation of spent nuclear fuel storage and subsequent transportation over extended periods (up to 300 years). Presently, the NRC believes that the current regulatory framework used to renew current licenses can be extended to regulate the management of spent nuclear fuel and high-level radioactive waste for multiple renewal periods. The staff is examining technical areas associated with multiple renewals of fixed-term, dry storage licenses and certificates to address age-related degradation of dry cask storage systems, structures, and components. The NRC acknowledges that current licensing practices may evolve over time in response to improved understanding, operational experience, and Commission policy direction. As technical, regulatory, and policy issues are resolved, the NRC will revise guidance and staff qualification and training accordingly. In the DGEIS, the NRC has concluded that sufficient information exists to perform an analysis of continued storage impacts well into the future. Nonetheless, the NRC continues to identify and resolve potential issues associated with the storage and transportation of spent nuclear fuel storage for periods beyond an ISFSI's initial licensing and first renewal. Completion of the current effort is planned for the end of the decade. As with any rule, the NRC will evaluate any new information that is developed during this project to determine whether it's necessary to update the Waste Confidence rule.

A15. How can the NRC proceed with this rulemaking while research on the extended storage of spent nuclear fuel is ongoing?

The DGEIS and the NRC's ongoing research are two separate efforts that are not directly related to each other. If completed, this rulemaking would result in an update to the NRC's environmental rules in 10 CFR part 51. The Waste Confidence GEIS, NUREG–2157, which was prepared under NEPA, would provide the regulatory basis for the rule. Under NEPA, an environmental impact statement, such as the one prepared to support this rulemaking, needs only to consider currently available information. As the Commission recently stated, ''NEPA requires that we conduct our environmental review with the best information available today. It does not require that we wait until inchoate information matures into something that later might affect our review.'' (*Luminant Generation Co. LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), et al., CLI–12–7, 75 NRC 379, 391–92 (March 16, 2012)). Further, the United States Court of Appeals for the District of Columbia Circuit explained that ''creating [the agency's] models with the best information available when it began its analysis and then checking the assumptions of those models as new information became available, was a reasonable means of balancing . . . competing considerations, particularly given the many months required to conduct full modeling with new data.'' (*Village of Bensenville* v. *Federal Aviation Administration,* 457 F.3d 52, 71–72 (D.C. Cir. 2006)). The United States Supreme Court held that ''an agency need not supplement an EIS every time new information comes to light after the EIS is finalized. To require otherwise would render agency decision making intractable, always awaiting updated information only to find the new information outdated by the time a decision is made.'' (*Marsh* v. *Oregon Natural Resources Council,* 490 U.S. 360, 374 (1989)).

The ongoing research into the extended storage of spent nuclear fuel is part of the NRC's effort to continuously evaluate and update its safety regulations. The NRC is not aware of any deficiencies in its current regulations that would challenge the continued safe storage of spent nuclear fuel in spent fuel pools or dry cask systems.

If, at some time in the future, the NRC were to identify a concern with the safe storage of spent nuclear fuel, the NRC would evaluate the issue and take whatever action or make whatever change in its regulatory program necessary to protect public health and safety. The NRC will continue to monitor the ongoing research into spent fuel storage. If warranted, the NRC will consider updating its Waste Confidence rule, which would be supported by a

new environmental analysis that would fully consider any new developments.

A16. Did the NRC factor in information from the Spent Fuel Pool Study in the DGEIS?

The DGEIS does not specifically reference the draft ''Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor'' (hereafter referred to as the Spent Fuel Pool Study or Study). If the NRC publishes a final Study before the final GEIS is published, then a reference to the Spent Fuel Pool Study will be added to the final GEIS. Although it did not specifically reference the draft Study in the DGEIS, the staff is aware of the conclusions in the draft Study and worked closely with the authors who developed the draft Study to prepare the relevant sections of the draft GEIS. The conclusions of the draft Study do not contradict the conclusions in the DGEIS and are consistent with the consequences reported in previous studies on spent fuel pool accidents. The draft Spent Fuel Pool Study was made public for review and comment on June 24 in advance of a July public Advisory Committee on Reactor Safeguards meeting on the draft Study. The draft Spent Fuel Pool Study is available to the public under ADAMS Accession No. ML13133A132.

A17. Did the NRC address accidents in the DGEIS?

Yes, the DGEIS considered the risk and potential consequences of accidents and acts of sabotage during continued storage of spent nuclear fuel. This analysis assessed the environmental effects of man-made hazards and natural phenomena hazards, including flooding and earthquakes. As with all NEPA analyses, the DGEIS analyzed reasonably-foreseeable events and did not consider worst-case scenarios. Section 4.18 of the DGEIS discusses the environmental impacts of postulated accidents, both design-basis and severe accidents, during continued at-reactor storage and Section 5.18 discusses away-from-reactor postulated accidents. Appendix F of the DGEIS contains a more detailed analysis of spent fuel pool fires. Sections 4.19 and 5.19 of the DGEIS address impacts resulting from acts of terrorism.

A18. Does the NRC Plan to hold public meetings on the Waste Confidence DGEIS and proposed rule?

Yes, the NRC plans to hold eight regional public meetings and two nationally Webcast meetings at NRC headquarters on the DGEIS and proposed rule. The regional meetings are planned to be held in or near: Charlotte, North Carolina; Denver, Colorado; Toledo, Ohio; Boston (metro area), Massachusetts; New York City (metro area), New York; Minneapolis, Minnesota; San Clemente, California; San Luis Obispo, California; and Orlando, Florida. These meetings will be held during the public comment period on the DGEIS and proposed rule. All meetings will be noticed on the NRC's Public Meeting Schedule Web site at *http://www.nrc.gov/public-involve/public-meetings/index.cfm.* Information on the public meetings will also be made available through the **Federal Register**, press releases, blog posts, and emails. The NRC will also post meeting notices to the Federal rulemaking Web site at *https://www.regulations.gov,* under Docket ID NRC–2012–0246.

A19. How can I stay informed of Waste Confidence activities?

There are several ways in which interested members of the public can stay informed and follow the NRC's Waste Confidence activities. The NRC staff periodically sends out email announcements of new material and upcoming events. Anyone may sign up to receive emails about the Waste Confidence activities by emailing *WCOutreach@nrc.gov* with a request to be added to the email list.

The NRC staff will also periodically post updates to the *Waste Confidence Web site.* You can sign up for automatic email alerts whenever the Waste Confidence Web site is updated using *GovDelivery.* Under Subscriber Preferences you can choose the Waste Confidence pages on which you would like to receive updates.

You can monitor the docket for the Waste Confidence rulemaking on the Federal rulemaking Web site, *http://www.regulations.gov,* by searching on Docket ID NRC–2012–0246. In addition, the Federal rulemaking Web site allows you to receive alerts when changes or additions occur in a docket folder. To subscribe: (1) Navigate to the docket folder NRC–2012–0246; (2) click the ''Email Alert'' link; and (3) enter your email address and select how frequently you would like to receive emails (daily, weekly, or monthly).

A20. How frequently does the NRC plan to revisit the Waste Confidence GEIS and rule?

The Commission has reviewed its Waste Confidence rule and supporting analysis three times since 1984; in 1990, 1999, and 2010. The NRC does not have a schedule for revisiting the Waste Confidence GEIS and rule after this current update. The Commission will review the Waste Confidence GEIS and rule for possible revision when warranted by significant events that may call into question the appropriateness of the rule.

A21. What should I consider as I prepare to submit my comments to the NRC?

Tips for preparing your comments. When submitting your comments, remember to:

I. Identify the rulemaking (RIN 3150–AJ20; NRC–2012–0246).

II. Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.

III. Describe any assumptions and provide any technical information and/or data that you used.

IV. If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.

V. Provide specific examples to illustrate your concerns and suggest alternatives.

VI. Explain your views as clearly as possible.

VII. Make sure to submit your comments by the comment period deadline identified.

VIII. The NRC is particularly interested in your comments concerning the following issues discussed in Section IV: (1) Issue 1 contains a request for comment on whether the Commission should remove the timeline for repository availability from the rule; (2) Issue 2 contains a request for comment on whether any statement related to the safety of continued spent fuel storage should be included in the rule; (3) Issue 3 contains a request for comment on whether the Discussion portion (Section III of this document) of the Statement of Considerations should be streamlined by removing content that is repeated from the DGEIS in order to improve clarity of the discussion; and (4) Issue 4 contains a request for comment on the title of the rule. In addition, Section VIII, Plain Writing, of this document contains a request for comments on the use of plain language, and Section X, Draft Environmental Impact Statement: Availability, of this document contains a request for comments on the draft environmental impact statement.

B. Waste Confidence Rulemaking

B1. What is the purpose of this Waste Confidence rulemaking?

The NRC's use of a rule to generically satisfy its NEPA obligations with respect

to continued storage will enhance efficiency in individual licensing reviews by analyzing the environmental impacts of continued storage, which are the same or largely similar at each nuclear power reactor or storage site, and codifying the results of that analysis. Part of the environmental analysis for a nuclear power reactor or storage facility license includes a review of the impacts caused by the spent nuclear fuel generated in the reactor. That analysis must assess the impacts of the spent nuclear fuel from generation through disposal. If the Commission lacks reasonable assurance that a disposal solution will be available at the end of a reactor's licensed life for operation, NEPA requires that the Commission assess the impacts of continued storage of the spent nuclear fuel pending disposal at a repository. The proposed rule would incorporate the results of the generic assessment of the environmental impacts of continued spent nuclear fuel storage beyond the end of a reactor's licensed life for operation so that it is not necessary to repeat the identical or substantially similar analysis in individual licensing actions. Although the environmental impacts of spent nuclear fuel storage during the licensed life for operation may be site specific, the impacts of continued storage can be generically assessed because the impacts during the reactor's licensed life for operation have been analyzed, are well understood, and the continued storage of spent nuclear fuel does not involve any significant changes in how the fuel is stored. Therefore, the environmental impacts that result from continued storage will remain essentially the same. A generic environmental analysis, such as the one conducted in the DGEIS, would apply to the issuance of a license, amendment, or license renewal of any power reactor or of any ISFSI. The analysis in the GEIS constitutes a regulatory basis for the proposed rule at 10 CFR 51.23, which codifies the NRC's conclusions in the GEIS on the environmental impacts of continued storage, including the Commission's expectations on the availability of a geologic repository.

B2. What is meant by the phrase ''licensed life for operation of a reactor''?

The phrase ''licensed life for operation of a reactor'' describes the period during which the NRC licensing requirements for reactor facility design, construction, and operation provide reasonable assurance that a reactor can be operated and spent fuel can be stored safely. It refers to the term of the license to operate a reactor, which in no case exceeds a 40-year initial license term. For those reactors for which license renewal has been granted, the DGEIS assumes up to two 20-year license extensions [5] could occur, for a total of up to 80 years. The phrase, ''beyond licensed life for operation of a reactor,'' refers to the period beyond the initial term to operate a reactor or, if the license is extended, beyond the renewed license term. The date of permanent cessation of operations does not mark the transition to ''beyond licensed life for operation.'' Even if a reactor is shut down years before the end of its initial or extended operating or combined license term, ''licensed life for operation'' continues to refer to the initial or renewed license term, and not the actual operational period of a reactor. Thus, continued storage begins at the end of the licensed life for operation of a reactor. The starting point for continued storage does not depend on whether the spent nuclear fuel is stored in a spent fuel pool, dry casks under a general license, or dry casks under a specific license.

The following examples help illustrate the concept of beyond the licensed life for operation of a reactor. Reactor A received a 40-year license to operate in 1965, which means the license would have expired in 2005. Reactor A renewed its license for a 20-year term, which means the license now will expire in 2025. Reactor A shuts down in 2025. The licensed life for operation for Reactor A ends in 2025 and continued storage begins in 2025.

Reactor B also received its initial license to operate in 1965, which means the license would have expired in 2005. Reactor B shut down early in 2000. The licensed life for operation of Reactor B ended in 2005, the original expiration date of the license. Continued storage of the spent nuclear fuel started in 2005.

Reactor C received its initial license in 1965, which means the license would have expired in 2005. Reactor C received two 20-year renewals with expiration dates of 2025 and 2045. Reactor C shut down in 2030. The licensed life for operation of Reactor C ends in 2045. Continued storage of the spent nuclear fuel begins in 2045 for all of the spent nuclear fuel from Reactor C.

In these examples, it is important to note that the environmental analysis supporting spent nuclear fuel storage during the licensed life for operation of each reactor covered the full period for which the license or license renewal was issued, even if operation of the reactor ended before the license expired.

B3. What timeframes are being considered in the DGEIS?

The NRC has analyzed three timeframes in the DGEIS that represent various scenarios for the length of continued storage that may be needed before spent fuel is sent to a repository. The first timeframe is the short-term timeframe, which analyzes 60 years of continued storage after the end of a reactor's licensed life for operation. The DGEIS also analyzed two additional timeframes: long-term and indefinite timeframes. The long-term timeframe considers the environmental impacts of continued storage for a total of 160 years after the end of a reactor's licensed life for operation. Finally, the DGEIS includes an analysis of an indefinite timeframe, which assumes that a repository never becomes available.

By the end of the short-term timeframe, some spent nuclear fuel could be up to 140 years old. Short-term storage of spent nuclear fuel includes:

- Continued storage of spent fuel in spent fuel pools (at-reactor only) and ISFSIs,
- Routine maintenance of spent fuel pools and ISFSIs (e.g., maintenance of concrete pads), and
- Handling and transfer of spent fuel from spent fuel pools to ISFSIs (all spent nuclear fuel is assumed to be removed from the spent fuel pool by the end of the short-term period).

Long-term storage is continued storage of spent nuclear fuel for an additional 100 years after the short-term period for a total of 160 years beyond the licensed life for operation of a reactor. The DGEIS assumes that all spent fuel has been transferred from the spent fuel pool to an ISFSI by the end of the short-term period. The DGEIS also assumes that a repository would become available by the end of this 160-year period. By the end of the long-term period, some spent nuclear fuel could be up to 240 years old. Long-term storage activities include:

- Continued storage of spent fuel in ISFSIs, including routine maintenance;
- One time replacement of ISFSIs and spent fuel canisters and casks; and
- Construction, operation, and one replacement of a dry transfer system facility (DTS).

The third timeframe analyzed by the DGEIS is indefinite storage, which assumes that a repository does not become available. The Commission does not believe that this scenario is likely to occur, but its inclusion in the analysis

[5] The Commission's regulations provide that renewed operating licenses may be subsequently renewed, although no licensee has yet submitted an application for such a subsequent renewal. The DGEIS included two renewals as a conservative assumption in evaluating potential environmental impacts.

helps the DGEIS to fully cover any likely environmental impacts associated with continued storage. The activities during the indefinite storage timeframe are the same as those that would occur for long-term storage; however, without a repository these activities would occur every 100 years.

B4. What is the significance of the levels of impact in the DGEIS (SMALL, MODERATE, LARGE)?

The NRC describes the affected environment in terms of resource areas: Land use, socioeconomics, environmental justice, air quality, climate change, geology and soils, surface water, groundwater, terrestrial resources, aquatic ecology, special status species and habitats, historic and cultural resources, noise, aesthetics, waste management, transportation, and public and occupational health. The DGEIS contains analysis of the environmental impacts associated with each resource area. Additionally, the DGEIS considers the impacts on resource areas caused by postulated acts of terrorism and accidents. The significance of the magnitude of the impact for most of the resource areas evaluated is expressed as SMALL, MODERATE, or LARGE. The general definitions of significance levels are:

SMALL: The environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that radiological impacts that do not exceed permissible levels in the Commission's regulations are considered small.

MODERATE: The environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE: The environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The DGEIS discussion of each resource area includes an explanation of how the significance category was determined. For issues in which the significance determination is based on risk (i.e., the probability of occurrence as well as the potential consequences), the probability of occurrence as well as the potential consequences have been factored into the determination of significance. For some resource areas the impact determination language is specific to the authorizing regulation or statute.

B5. What are the environmental impacts of at-reactor continued storage?

The environmental impacts of continued storage are analyzed in the DGEIS. The DGEIS contains a detailed analysis of the impacts for short-term storage, long-term storage, and indefinite storage. The analysis considers both at-reactor storage and away-from-reactor storage.[6] Impacts attributable to at-reactor storage are addressed here and the impacts from away-from-reactor storage are addressed in question B6.

For at-reactor storage, the unavoidable adverse environmental impacts for each resource area are SMALL for all timeframes with the exception of waste management impacts, which are SMALL to MODERATE for the indefinite storage timeframe, and historic and cultural impacts, which are SMALL, MODERATE, or LARGE for the long-term and indefinite storage timeframes. These elevated impact conclusions are influenced, in part, by the uncertainties regarding the specific circumstances of continued storage over long timeframes, including site-specific characteristics that could affect the intensity of potential environmental impacts and the resulting analysis assumptions that have been made by the NRC as documented in detail in Chapter 4 of the DGEIS. The moderate waste-management impacts are associated with the volume of nonhazardous solid waste generated by assumed facility replacement activities for only the indefinite timeframe. The SMALL, MODERATE, or LARGE historic and cultural impacts are based on a combination of the additional surface-disturbing activities from DTS construction and facility replacement activities during long-term and indefinite timeframes and a range of site-specific characteristics that are assumed for the purpose of evaluating a reasonable range of potential impacts. More specifically, these potential historic and cultural impacts vary depending on whether resources are present, the extent of proposed land disturbance, if the area has been previously surveyed to identify historic and cultural resources, and if the licensee has management plans and procedures that are protective of historic and cultural resources. For special status species, at-reactor ISFSI storage would not be likely to adversely affect special status species and habitats, whereas spent fuel pool continued storage impacts would be based on site-specific conditions and determined as part of an Endangered Species Act Section 7 consultation. The NRC environmental justice impact analysis concluded there would be no disproportionately high and adverse human health and environmental impacts on minority and low-income populations.

The following table provides a summary of the environmental impacts of continued at-reactor storage. Detailed discussion for each resource area can be found in Chapter 4 of the DGEIS. Cumulative impacts are addressed in Chapter 6 of the DGEIS. Chapter 8 of the DGEIS provides a summary of the impacts.

TABLE 1—ENVIRONMENTAL IMPACTS OF AT-REACTOR CONTINUED STORAGE OF SPENT NUCLEAR FUEL

Resource area	Short-term storage	Long-term storage	Indefinite storage
Land Use	SMALL	SMALL	SMALL.
Socioeconomics	SMALL	SMALL	SMALL.
Environmental Justice	No disproportionately high and adverse impacts.		
Air Quality	SMALL	SMALL	SMALL.
Climate Change	SMALL	SMALL	SMALL.
Geology and Soils	SMALL	SMALL	SMALL.
Surface Water:			
Quality	SMALL	SMALL	SMALL.
Use	SMALL	SMALL	SMALL.
Groundwater:			

[6] For the purposes of the DGEIS impact analysis, the GEH-Morris facility and the DOE TMI–2 ISFSI at Idaho Falls, Idaho were considered under the at-reactor storage evaluation.

TABLE 1—ENVIRONMENTAL IMPACTS OF AT-REACTOR CONTINUED STORAGE OF SPENT NUCLEAR FUEL—Continued

Resource area	Short-term storage	Long-term storage	Indefinite storage
Quality	SMALL	SMALL	SMALL.
Use	SMALL	SMALL	SMALL.
Terrestrial Resources	SMALL	SMALL	SMALL.
Aquatic Ecology	SMALL	SMALL	SMALL.
Special Status Species and Habitats.	Impacts from the spent fuel pool would be determined as part of Endangered Species Act Section 7 consultation; ISFSI operations are not likely to adversely affect special status species and habitats.	Not likely to adversely affect	Not likely to adversely affect.
Historic and Cultural Resources	SMALL	SMALL, MODERATE, or LARGE	SMALL, MODERATE, or LARGE.
Noise	SMALL	SMALL	SMALL.
Aesthetics	SMALL	SMALL	SMALL.
Waste Management:			
LLW	SMALL	SMALL	SMALL.
Mixed Waste	SMALL	SMALL	SMALL to MODERATE.
Nonradioactive Waste	SMALL	SMALL	SMALL to MODERATE.
Transportation			
Traffic	SMALL	SMALL	SMALL.
Health impacts	SMALL	SMALL	SMALL.
Public and Occupational Health	SMALL	SMALL	SMALL.
Accidents	SMALL.		
Terrorism Considerations	SMALL.		

B6. What are the environmental impacts of away-from-reactor continued storage?

The away-from-reactor environmental impacts analyzed in the DGEIS include the impacts from constructing the ISFSI. Although an away-from-reactor ISFSI would be subject to a site-specific licensing review that includes an environmental impact statement that would assess the environmental impacts due to construction, the impacts due to construction are included in the DGEIS due to the potential for that construction to occur during the timeframes analyzed in the DGEIS. For away-from-reactor storage, the unavoidable adverse environmental impacts for each resource area would be SMALL except for air quality, terrestrial ecology, aesthetics, waste management, and transportation where the impacts would be SMALL to MODERATE. Socioeconomic impacts would range from SMALL to beneficial and LARGE and historic and cultural impacts could be SMALL, MODERATE, or LARGE. The potential MODERATE impacts on air, terrestrial wildlife, and transportation are based on construction-related potential fugitive dust emissions, terrestrial wildlife direct and indirect mortalities, and temporary construction traffic impacts. The potential MODERATE impacts on aesthetics and waste management are based on noticeable changes to the viewshed from constructing a new away-from-reactor ISFSI, and the volume of nonhazardous solid waste generated by assumed ISFSI and DTS replacement activities for only the indefinite timeframe. The potential beneficial and LARGE impacts on socioeconomics would be due to local economic tax revenue increases from an away-from-reactor ISFSI. The potential LARGE impacts on historic and cultural and special status species apply to assumed site-specific circumstances at an away-from-reactor ISFSI involving the presence of these resources during construction activities and absence of effective protection measures. Specifically, these potential historic and cultural impacts vary depending on whether resources are present, the extent of proposed land disturbance, and whether the licensee has management plans and procedures that are protective of historic and cultural resources. For special status species, away-from-reactor ISFSI storage would not be likely to adversely affect special status species and habitats based on the assumption an ISFSI can be sited to avoid special status species and habitats. Impacts on special status species and habitats would be based on site-specific conditions and determined as part of an Endangered Species Act Section 7 consultation. The NRC environmental justice impact analysis for an away-from-reactor ISFSI concluded there would be no disproportionately high and adverse human health and environmental impacts on minority and low-income populations.

The following table provides a summary of the environmental impacts from away-from-reactor continued storage: Detailed discussion for each resource area can be found in Chapter 5 of the DGEIS. Cumulative impacts are addressed in Chapter 6 of the DGEIS. Chapter 8 of the DGEIS provides a summary of the impacts.

TABLE 2—ENVIRONMENTAL IMPACTS OF AWAY-FROM REACTOR CONTINUED STORAGE OF SPENT NUCLEAR FUEL

Resource area	Short-term storage	Long-term storage	Indefinite storage
Land Use	SMALL	SMALL	SMALL.
Socioeconomics	SMALL (adverse) to LARGE (beneficial).	SMALL (adverse) to LARGE (beneficial).	SMALL (adverse) to LARGE (beneficial).

TABLE 2—ENVIRONMENTAL IMPACTS OF AWAY-FROM REACTOR CONTINUED STORAGE OF SPENT NUCLEAR FUEL—Continued

Resource area	Short-term storage	Long-term storage	Indefinite storage
Environmental Justice	No disproportionately high and adverse impacts.		
Air Quality	SMALL to MODERATE	SMALL	SMALL.
Climate Change	SMALL	SMALL	SMALL.
Geology and Soils	SMALL	SMALL	SMALL.
Surface Water:		SMALL	SMALL.
Quality	SMALL		
Use	SMALL		
Groundwater		SMALL	SMALL.
Quality	SMALL		
Use	SMALL		
Terrestrial Resources	SMALL to MODERATE	SMALL	SMALL.
Aquatic Ecology	SMALL	SMALL	SMALL.
Special Status Species and Habitats.	Impacts from the construction of the ISFSI would be determined as part of Endangered Species Act Section 7 consultation. Assuming the ISFSI can be sited to avoid special status species and habitats, operation and replacement of the ISFSI is not likely to adversely affect special status species and habitats. Impacts would be determined as part of Endangered Species Act Section 7 consultation if continued storage would affect listed species or critical habitat.		
Historic and Cultural Resources	SMALL, MODERATE, or LARGE	SMALL, MODERATE, or LARGE	SMALL, MODERATE, or LARGE.
Noise	SMALL	SMALL	SMALL.
Aesthetics	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE.
Waste Management:			
LLW	SMALL	SMALL	SMALL.
Mixed Waste	SMALL	SMALL	SMALL.
Nonradioactive Waste	SMALL	SMALL	SMALL to MODERATE.
Transportation:			
Traffic	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE.
Health	SMALL		
Public and Occupational Health	SMALL	SMALL	SMALL.
Accidents	SMALL.		
Terrorism Considerations	SMALL.		

B7. Does a potentially LARGE impact on historic and cultural resources affect the generic determination in the Waste Confidence DGEIS?

The generic determination found in the DGEIS is not affected by the potentially LARGE impact on historic and cultural resources. As noted in Question A.2, the DGEIS describes a range of potential impacts associated with continued storage. The impact resulting from a specific licensing action associated with continued storage (e.g., construction of a DTS) would be determined by site-specific factors in a subsequent NEPA and National Historic Preservation Act (NHPA) Section 106 review. If LARGE impacts were determined, under the site-specific environmental review and NHPA process, consultation would continue as the NRC develops and evaluates alternatives or modifications to avoid, minimize, or mitigate adverse effects to historic properties and impacts to other historic and cultural resources. An agency official must complete the Section 106 process before making a decision on an undertaking.

B8. How will the proposed rule address the impacts from continued storage of spent nuclear fuel?

The NRC is proposing revisions to 10 CFR 51.23(a) that reflect the analysis and conclusions of the DGEIS (NUREG–2157). Proposed 10 CFR 51.23(a) provides that: (1) The analysis generically addresses the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor; and (2) the analysis supports the determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor.

Paragraph (b) of 10 CFR 51.23 would be revised to clarify that ISFSI renewals are included in the scope of the generic determination. Additionally, conforming changes would be made to 10 CFR 51.61, 51.80(a), and 51.97(a) to clarify that ISFSI license renewals are included in the scope of waste confidence.

B9. What are the key assumptions used in the DGEIS?

To guide its analysis, the NRC relied upon certain reasonably foreseeable assumptions regarding storage of spent nuclear fuel. A detailed discussion of these assumptions is contained in Section 1.8.3 of the DGEIS. Key assumptions used in the DGEIS include:

- Institutional controls, the continued regulation of spent nuclear fuel, will continue.
- Spent fuel canisters and casks would be replaced approximately once every 100 years.
- A DTS would be built at each ISFSI location for fuel repackaging and the ISFSIs and DTS facilities would be replaced approximately once every 100 years.
- All spent nuclear fuel would be removed from spent fuel pools to dry storage by the end of the short-term storage timeframe (60 years after licensed life).
- An ISFSI of sufficient size to hold all spent nuclear fuel generated during licensed life for operation will be constructed before the end of the licensed life.

• The analyses in the DGEIS are based on current technology and regulations.

B10. What did the NRC assume regarding the continuation of institutional controls and why?

The DGEIS assumes that regulatory controls of spent nuclear fuel or ''institutional controls'' would continue during the time when spent nuclear fuel is stored at an ISFSI at either on-site or at away from reactor site locations. Consistent with the ongoing regulation of operating nuclear facilities, the DGEIS assumes operating facilities would continue to maintain safety significant structures, systems, and components. For example, spent fuel storage casks are assumed to be maintained and replaced prior to any significant degradation and release of spent nuclear fuel (*i.e.,* the DGEIS assumes spent fuel storage casks are replaced every 100 years).

Therefore, the storage of spent nuclear fuel in any combination of storage (spent fuel pool or dry cask) is assumed to continue as a licensed activity under regulatory controls and oversight. Nonetheless, the conclusions reached by the NRC in the DGEIS regarding the technical feasibility of continued storage do not rely solely on the NRC's regulatory framework governing these activities. Rather, these conclusions are also based on the NRC's experience with the actual storage of spent nuclear fuel under this regulatory framework and the continued application of proven spent nuclear fuel-storage methodologies. Decades of operating experience and ongoing NRC inspections demonstrate that reactor and ISFSI licensees continue to meet their obligation to safely store spent nuclear fuel in accordance with the requirements of 10 CFR parts 50, 52, and 72. If the NRC were to find noncompliance with these requirements or otherwise identify a concern with the safe storage of the spent nuclear fuel, the NRC would evaluate the issue and take whatever action or change in its regulatory program necessary to protect the public health and safety and the environment.

Storage of spent nuclear fuel poses a sufficient hazard to the environment and to humans that the Commission considers it very unlikely that regulatory controls and oversight would cease to exist. Although disposal facilities generally consider the loss of institutional controls, such analysis is for time periods after the facility is permanently closed (*i.e.,* no longer operating) and the hazard is significantly reduced due to disposal deep underground (e.g., on the order of 1,000 feet underground). Further, at some period beyond the closure of the disposal facility, there is a potential that the knowledge of the intended purpose of the facility could be lost, thereby increasing the likelihood that an inadvertent intrusion could occur. In contrast, a dry storage facility is typically a visible surface structure requiring active maintenance and security, making loss of institutional control so unlikely that it is a remote and speculative occurrence. Given that NEPA does not require consideration of remote and speculative issues, this analysis has not been included in the DGEIS.

While the DOE assumed loss of institutional control in the ''Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County Nevada'' (Yucca Mountain FEIS) (ADAMS Accession No. ML081750212), the NRC assumed the continuation of institutional controls in this DGEIS because the purpose of the analysis here is fundamentally different from the analysis conducted by the DOE for Yucca Mountain. The Waste Confidence DGEIS analyzes the environmental impacts of continued storage of spent nuclear fuel pending ultimate disposal in a deep geologic repository. In the Yucca Mountain documents, the DOE needed to compare the no-action alternative of not disposing of the fuel with the proposed action of disposal at Yucca Mountain. Because the proposed action assumed that active institutional controls would continue for only 100 years after the closure of the Yucca Mountain site, DOE concluded it was reasonable to analyze a no action alternative that assumed a similar level of institutional controls. The DOE noted, however, that in the event Yucca Mountain did not become a disposal site for spent nuclear fuel, the no-action alternative analyzed in the Yucca Mountain FEIS was unlikely because the Federal government would develop a different disposal plan for the spent nuclear fuel that would provide better protection of the public and the environment than continued on-site storage. (Yucca Mountain FEIS 2–56–65).

B11. How would significant changes in these assumptions be addressed under the NRC's regulatory framework?

The NRC has historically reviewed the Waste Confidence rule as the policy and technological foundations for spent nuclear fuel storage and disposal have evolved. Technological changes that might require revisiting the assumptions, such as revisions to the NRC's safety regulations that allow or require a shorter or longer period of time before repackaging, are likely to not affect the overall conclusions in the DGEIS that provides a regulatory basis for the Waste Confidence rule and, accordingly, would not justify an update to the rule. These technological changes could require licensees to amend their licenses, which would be accompanied by site specific safety and environmental reviews. The NRC will continue to monitor changes in National policy and developments in spent nuclear fuel storage and disposal technology. When warranted by a change in assumptions that would significantly affect the predicted impacts of continued storage, the NRC will consider updating its Waste Confidence rule, which would be supported by a new environmental analysis that would fully consider any new developments.

B12. What is the technical basis for concluding that continued storage can occur safely?

Technical understanding and experience continues to support the technical feasibility of safe storage of spent nuclear fuel in spent fuel pools and in dry casks, based on their physical integrity over long periods of time (*e.g.,* slow degradation of spent fuel during storage in spent fuel pools and dry casks and engineered features of storage pools and dry casks to safely withstand accidents caused by either natural or human-made phenomena). Additionally, regulatory oversight has been shown to enhance safety designs and operations as concerns and information evolve over time (*e.g.,* security and safety enhancements made after the September 11, 2001, terrorist attacks and the March 2011 Fukushima Dai-ichi disaster; and corrective actions to address spent fuel pool leaks) (*see* Section B.3 of Appendix B of the DGEIS and Section III.C.3, *Storage of Spent Nuclear Fuel at a Storage Facility,* of this document for additional information).

If necessary, there is no technical reason that storage of spent fuel in either spent fuel pools or dry casks cannot continue beyond 60 years after the end of the reactor's licensed life for operation. Storage of spent fuel beyond this time would continue under an approved aging management program to ensure that monitoring and maintenance are adequately performed. The DGEIS assumes that, at an appropriate time, structures, systems, and components of the ISFSIs would be replaced as part of an approved aging management

program. The DGEIS assumes that these replacement activities begin during the long-term timeframe; however, based on current information, there is no expectation or requirement for replacement to occur at any specific time in the future. Continued experience with storing spent fuel will guide and inform aging management plans. At present, replacement activities (*i.e.,* large-scale replacement of dry cask storage systems) are expected to occur no earlier than 60 years after the end of the reactor's licensed life for operation.

B13. If the NRC is considering extending the timeframe of safe storage, how is that not de facto on site disposal?

Nothing in this rulemaking or the DGEIS authorizes the continued storage of spent nuclear fuel. Storage of spent nuclear fuel is authorized in site-specific licensing actions under 10 CFR parts 50, 52, or 72. The general license provisions of 10 CFR part 72 also authorize storage of spent nuclear fuel in dry cask storage systems. The DGEIS and this rulemaking are intended to generically resolve the NRC's NEPA obligations with respect to the continued storage of spent nuclear fuel.

Although the timeframe for storage of spent nuclear fuel is longer than originally planned, the national policy embodied in the Nuclear Waste Policy Act Amendments of 1987 remains unchanged: Disposal of spent nuclear fuel in a deep geologic repository. Given the uncertainties in achieving a national consensus for the site of a repository that could affect the time it becomes available, the NRC has analyzed different timeframes for continued storage. Conducting this analysis enables NRC to comply with its NEPA obligations to analyze all reasonably foreseeable impacts of its licensing actions, even if the short-term storage scenario is more likely than long-term or indefinite storage. This analysis does not constitute an endorsement of an extended timeframe for storage of spent nuclear fuel. Additionally, the NRC does not create national policy for disposal of spent nuclear fuel. That responsibility lies exclusively with Congress and the President and, as noted, is presently expressed by the Nuclear Waste Policy Act Amendments of 1987. Rather, the NRC must implement national policy set by Congress and the President by evaluating, in the context of its licensing and regulatory actions, how that policy will affect continued storage of spent fuel after the licensed life of a reactor's operation.

B14. Does the U.S. Department of Energy's motion to withdraw its Yucca Mountain application affect the NRC's conclusion that geologic disposal is technically feasible?

No. The Waste Confidence proceeding has historically addressed the technical feasibility of a repository without regard to a specific site, such as Yucca Mountain. As stated by Congress in the Nuclear Waste Policy Amendments of 1987, the national program for permanent spent nuclear fuel disposal remains premised on a deep geologic repository. The Blue Ribbon Commission on America's Nuclear Future in its January 2012 report (the ''BRC Report'') (ADAMS Accession No. ML120970375) reaffirmed the need and feasibility for deep geologic disposal of spent nuclear fuel. Further, deep geologic disposal is internationally recognized as the best solution. (Nuclear Energy Agency Organisation for Economic Co-operation and Development, ''Moving Forward With Geological Disposal of Radioactive Waste,'' 2008, *http://www.oecd-nea.org/rwm/reports/2008/nea6433-statement.pdf.*) Other countries are also pursuing geologic repositories for disposal of spent nuclear fuel and high-level radioactive waste. The Commission's exhaustive reviews supporting its earlier Waste Confidence decision have not identified any challenge to the technical feasibility of deep geologic disposal, and the Commission has therefore repeatedly affirmed its previous Waste Confidence Decision updates that a repository is technically feasible.

B15. What changes are being proposed for the timing of a geologic repository?

The NRC is proposing a change to 10 CFR 51.23(a) that would reflect the most likely timeframe for repository availability. Proposed paragraph (a)(2) of 10 CFR 51.23 states that it is feasible to have a mined geologic repository within 60 years following the licensed life of operation for a reactor.

B16. Why does the NRC think it is feasible that a repository can be available in 60 years?

As discussed in the DGEIS, the NRC has analyzed three timeframes that represent various scenarios for the length of continued storage that will be needed before spent fuel is sent to a repository. The first, most likely, timeframe is the short-term timeframe, which analyzes 60 years of continued storage after the end of a reactor's licensed life for operation. As discussed in the DGEIS, the NRC has concluded this is a likely timeframe, in part, because the DOE has expressed its intention to provide repository capacity by 2048, which is well before the 60 years after licensed life for operation for all currently operating plants, and about 10 years before the end of this timeframe for the oldest spent fuel within the scope of this analysis. Further, international and domestic experience with deep geologic repository programs supports a timeline of 25–35 years to provide repository capacity for the disposal of spent fuel. The DOE's prediction of 2048 is in line with this expectation. The NRC acknowledges, however, that the short-term timeframe, although the most likely, is not certain. The availability of a repository can be substantially affected by whatever process is employed to achieve a national consensus on repository site selection. The outcome of a search for a new repository location is uncertain. Accordingly, the DGEIS also analyzed two additional timeframes. The long-term timeframe considers the environmental impacts of continued storage for a total of 160 years after the end of a reactor's licensed life for operation. Finally, although the NRC considers it highly unlikely, the DGEIS includes an analysis of an indefinite timeframe, which assumes that a repository does not become available.

In picking a timeframe by which the Commission believes that a geologic repository is likely to become available, the Commission in no way means to imply that it believes that spent fuel will need to be stored indefinitely. Nor does it imply that a repository is only feasible at the end of the 60-year timeframe or that any particular repository site is precluded under the analysis. United States law supports the objective of timely disposal of spent nuclear fuel and high-level radioactive waste in a geologic repository, and the DOE is currently the agency responsible for carrying out the national policy to site and build a repository. However, spent nuclear fuel may need to be stored for several decades at either reactor sites or away-from-reactor sites before ultimate disposal is available in a geologic repository. Having considered all available information, the Commission believes that the most likely timeframe for repository availability is 60 years beyond a reactor's licensed life for operation (*see* also the discussion in Appendix B of the DGEIS and Section III.C.2, *Geologic Repository—Technical Feasibility and Availability* of this document).

B17. How does this rulemaking relate to the licensing of future away-from-reactor ISFSIs?

Future away-from-reactor ISFSI applicants must conduct a site-specific environmental analysis to support their licensing. An away-from-reactor ISFSI applicant or licensee cannot use the Waste Confidence rule and GEIS or the 10 CFR part 72 subpart K general license as the basis for constructing an away-from-reactor ISFSI. If necessary, the site-specific NEPA analysis for an away-from-reactor ISFSI could only rely on the analysis in the DGEIS and rule to a limited extent to satisfy its NEPA obligations with respect to the storage of spent nuclear fuel after the expiration of the away-from-reactor ISFSI license.

B18. How does this rulemaking relate to the certification of spent fuel storage casks and use of the 10 CFR part 72 general storage license to store spent nuclear fuel at operating or decommissioned reactor facilities that are licensed under 10 CFR parts 50 or 52 by the NRC?

The Waste Confidence rulemaking does not directly relate to cask certification because certifications are design reviews that do not consider or approve the loading of any specific fuel at any specific location. With respect to the use of general spent fuel storage licenses, these were issued under 10 CFR 72.210 to all licensees in possession of a 10 CFR parts 50 or 52 license. Licensing actions that have already occurred are not altered or affected by this rulemaking.

B19. How can a future site-specific reactor EIS or supplement that references the GEIS be used to understand the environmental impacts of the no-action alternative of not approving nuclear power operations at a proposed site?

Both site-specific reactor EISs for initial licensing and site-specific supplements to the license renewal GEIS (NUREG–1437) include descriptions of the no-action alternative of not granting the initial license or not renewing the existing license, respectively. The description of the no-action alternative in site-specific reactor EISs that support initial reactor licensing discusses impacts that would be avoided if the NRC did not grant the license. Similarly, the site-specific supplements to the license renewal GEIS describe environmental impacts that would be avoided should the NRC not renew an operating license for an existing reactor, and the reactor shut down at, or before, the end of its license term and began decommissioning.

For both proposed new reactors and proposed reactor license renewals, the Waste Confidence GEIS would be of limited use in understanding the environmental impacts of the no-action alternative of not approving the requested licenses. If no new license were issued, there would be no spent nuclear fuel generated (or no additional spent nuclear fuel generated in the case of a renewal) or stored at the site as a result of the proposed actions and therefore no environmental impacts triggered by those actions. The Waste Confidence GEIS would describe the impacts of continued storage that could be avoided or reduced if the no-action alternative were selected. The Waste Confidence GEIS would also describe the impacts of continued storage of already existing spent fuel in the case of evaluating the no action alternative related to the renewal of a license for an already existing facility.

B20. What changes are being proposed to address continued storage for license renewal?

Table B–1, ''Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants'' addresses the environmental impacts of license renewal activities by resource area. Table B–1 is located in appendix B to subpart A of 10 CFR part 51, ''Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.'' When the Commission issued the final rule on the environmental effects of license renewal, it was not able to rely on the Waste Confidence rule for two of the issues (78 FR 37282; June 20, 2013) (ADAMS Accession No. ML13101A059). The Commission noted that upon issuance of the GEIS and revised Waste Confidence rule, the NRC would make any necessary conforming changes to the license renewal rule. The proposed rule would revise two finding column entries to address continued storage. The ''Offsite radiological impacts of spent nuclear fuel and high-level waste disposal'' issue would be reclassified as a Category 1 impact and the finding column entry revised to address continued storage. For the ''Onsite storage of spent nuclear fuel'' issue, the finding column entry would be revised to include the period of continued storage.

C. Decision

C1. Introduction

Historically, the Waste Confidence Decision contained five ''Findings'' that addressed the technical feasibility of a mined geologic repository, the degree of assurance that disposal would be available by a certain time, and the degree of assurance that spent fuel and high-level waste could be managed safely without significant environmental impacts for a certain period beyond the expiration of plants' operating licenses. Preparation of and reliance upon a GEIS is a fundamental departure from the approach used in past Waste Confidence proceedings. What had been ''Findings'' in past Decisions are now conclusions based on the information that is provided in the DGEIS on environmental impacts from continued storage and the associated assessment of spent nuclear fuel storage and disposal practices nationally and internationally. The DGEIS acknowledges the uncertainties inherent in any prediction of repository availability and provides an environmental analysis of any reasonably foreseeable timeframes. To this end, the DGEIS considers a number of possible timeframes for repository availability, including the impacts from never having a repository.

This section provides a discussion of the issues and conclusions addressed in the DGEIS that had previously appeared in the findings discussions of prior Waste Confidence decisions. Based on the NRC's analysis in the DGEIS, the discussion in this section addresses the issues assessed in the ''Five Findings'' as conclusions, regarding the agency's prediction as to the availability of a repository (*see* Section III.C2., *Geologic Repository—Technical Feasibility and Availability,* of this document) and conclusions regarding the technical feasibility of safely storing spent fuel in an at-reactor or away-from-reactor storage facility (*see* Section III.C3., *Storage of Spent Nuclear Fuel at a Storage Facility,* of this document). The DGEIS now fulfills NRC's NEPA obligations for analyzing the environmental impacts of continued storage and the related uncertainties in repository availability. Specific sections of the DGEIS are referenced, as appropriate, throughout Section III.C., *Decision,* of this document. The following paragraphs frame the issues considered in developing these conclusions in terms of the technical feasibility and availability of a repository and the safe management of continued storage of spent nuclear fuel.

C2. Geologic Repository—Technical Feasibility and Availability

The issue of the technical feasibility of a geologic repository was historically addressed in Finding 1 of the Waste Confidence Decision and the availability of a repository was addressed in Finding

2. ''Technical feasibility'' simply means whether construction and operation of a geologic repository is technically possible using existing technology without any fundamental breakthroughs in science and technology. If technically feasible, then the question becomes what is a reasonable timeframe for the siting, licensing, construction, and opening of a geologic repository.

In past Waste Confidence proceedings in 1984, 1990, and 2010, the NRC reviewed the technical feasibility of deep geologic disposal and each time concluded that this method of disposal is technically feasible. As discussed in more detail in this section, the NRC has not found any new information that would challenge this determination. In fact, new information that has been developed since 2010 provides further support for the Commission's conclusion that deep geologic disposal is technically feasible.

The DOE's selection of a suitable site is governed by the Nuclear Waste Policy Act (NWPA) (96 Stat. 2201 (1983) (current version at 42 U.S.C. 10132 (2006)). The DOE explored potential repository sites before the NWPA was enacted, but the NWPA set in place a formal process and schedule for the development of two geologic repositories. The following brief summary of key provisions of the NWPA may assist readers in understanding the DOE's process for locating a suitable site.

As initially enacted, Section 112 of the NWPA directed DOE to issue guidelines for the recommendation of sites; then to nominate at least five sites as suitable for site characterization for selection as the first repository site; and, not later than January 1, 1985, to recommend three of those sites to the President for characterization as candidate sites. Not later than July 1, 1989, DOE was to again nominate five sites and recommend three of them to the President for characterization as candidate sites for the second repository. Section 113 of the NWPA directed DOE to carry out site characterization activities for the approved sites. Following site characterization, Section 114 directed DOE to recommend sites to the President as suitable for development as repositories and the President was to recommend one site to the Congress by March 31, 1987, and another site by March 31, 1989, for development as the first two repositories. States and affected Indian tribes were given the opportunity to object, but if the recommendations were approved by Congress, DOE was to submit applications for a construction authorization to the NRC. The NRC was given until January 1, 1989, to reach a decision on the first application and until January 1, 1992, on the second. The Commission was directed to prohibit the emplacement of more than 70,000 metric tons heavy metal (MTHM) in the first repository until a second repository was in operation. In 1987, Congress amended the NWPA to restrict site characterization solely to a site at Yucca Mountain, Nevada and terminated the program for a second repository. The amended NWPA provided that if at any time the DOE determines Yucca Mountain to be unsuitable for development as a repository, the DOE must report to Congress its recommendations for further action to ensure the safe, permanent disposal of spent nuclear fuel and high-level radioactive waste, including the need for new legislation.

Support for the feasibility of geologic disposal can be drawn from experience gained from the review of the DOE's Yucca Mountain license application. The DOE made its suitability determination for the Yucca Mountain site in 2002. On June 3, 2008, the DOE submitted an application for a construction authorization to the NRC, and on September 8, 2008, the NRC staff notified the DOE that it found the application acceptable for docketing (73 FR 53284; September 15, 2008) and began its review. Although the DOE subsequently filed a motion with the NRC Atomic Safety and Licensing Board seeking permission to withdraw the license application for a high-level nuclear waste repository at Yucca Mountain (ADAMS Accession No. ML100621397), the NRC's review continued until September 2011. The NRC's review did not identify any issues that would challenge the feasibility of geological disposal. This conclusion is reflected in two technical review documents: NUREG–2108, ''Technical Evaluation Report on the Content of the U.S. Department of Energy Yucca Mountain Repository License Application—Preclosure Volume: Repository Safety Before Permanent Closure'' (ADAMS Accession No. ML11250A093), and NUREG–2107, ''Technical Evaluation Report on the Content of the U.S. Department of Energy's Yucca Mountain Repository License Application—Postclosure Volume: Repository Safety After Permanent Closure'' (ADAMS Accession No. ML11223A273). These documents contain the NRC staff's technical reviews of the DOE's license application for Yucca Mountain in the areas of safety before permanent closure and after permanent closure.

Additionally, the DOE has sited and constructed, and is operating, a deep geologic repository for defense-related transuranic radioactive waste near Carlsbad, New Mexico. The Waste Isolation Pilot Plant (WIPP), in operation since 1999, is located in the Chihuahuan Desert of southeastern New Mexico, approximately 26 miles east of Carlsbad. At this site, the DOE has successfully disposed of transuranic waste from nuclear weapons research and testing operations. The WIPP project provides additional evidence that a geologic repository is technically feasible. During its 14 years of operation, no issues have been identified that would challenge the feasibility of geologic disposal.

Today, the consensus within the scientific and technical community engaged in spent nuclear fuel management activities at both a national and international level continues to be that safe geologic disposal is achievable with currently available technology (*see, e.g.,* BRC Report (Section 4.3)). Ongoing research in the United States and other countries supports the conclusion that geologic disposal remains viable and that acceptable sites can be identified. Despite decades of research into various geologic media, no insurmountable technical or scientific problem has emerged to disturb the confidence that safe disposal of spent nuclear fuel and high-level radioactive waste can be achieved in a mined geologic repository. There has been significant progress in the scientific understanding and technological development needed for geologic disposal over the past two decades. There is now a much better understanding of the processes that affect the ability of repositories to isolate waste over long periods (International Atomic Energy Agency (IAEA), ''Scientific and Technical Basis for the Geologic Disposal of Radioactive Wastes, Technical Reports Series No. 413'' 2003). The ability to characterize and quantitatively assess the capabilities of geologic and engineered barriers has been repeatedly demonstrated (Organisation for Economic Cooperation and Development, Nuclear Energy Agency, ''Lessons Learnt From Ten Performance Assessment Studies,'' 1997). Specific sites have been investigated and extensive experience has been gained in underground engineering (IAEA, ''Radioactive Waste Management Studies and Trends, IAEA/WMDB/ST/4,'' 2005; IAEA, ''The Use of Scientific and Technical Results From Underground Research Laboratory Investigations for the Geologic Disposal

of Radioactive Waste, IAEA–TECDOC–1243,'' 2001). These advances and others throughout the world continue to confirm the soundness of the basic concept of deep geologic disposal (IAEA, ''Joint Convention on Safety of Spent Fuel Management and on Safety of Radioactive Waste Management, INFCIRC/546,'' 1997). (Note that copies of all IAEA documents are available on the IAEA Web site at *http://www.IAEA.org.*)

In the United States, the technical approach for safe high-level radioactive waste disposal has remained unchanged for several decades, *i.e.,* a deep geologic repository containing natural barriers to hold canisters of high-level radioactive waste with additional engineered barriers to further retard radionuclide release. Although some elements of this technical approach have changed in response to new knowledge, safe disposal is still feasible with current technology.

The BRC Report recommended ''prompt efforts to develop one or more geologic disposal facilities'' (p vii). The BRC Report did not identify any obstacles to the technical feasibility of siting, constructing, and operating a repository. In the DOE ''Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste'' (hereafter referred to as the DOE Strategy Report) (ADAMS Accession No. ML13011A138), the DOE responded to the BRC Report by presenting a framework for ''moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel and high-level radioactive waste from civilian nuclear power generation . . . .'' The new DOE strategy includes a nuclear waste management system consisting of a pilot interim storage facility, a larger full-scale interim storage facility, and a geologic repository. No new information has emerged that would cause the Commission to revisit its conclusions from previous Waste Confidence rulemakings that deep geologic disposal is technically feasible. The Commission therefore concludes that deep geologic disposal continues to be technically feasible.

Given that geologic repositories continue to be technically feasible, the question then becomes how long it is likely to take to successfully site, license, construct, and open a repository. In answering this question, the Commission has, among other things, historically drawn upon international experience to inform its conclusion of how long it will likely take to successfully site, license, construct, and open a repository. Of the 24 countries (other than the United States) considering disposal of spent or reprocessed nuclear fuel in deep geologic repositories, 10 have established target dates for the availability of a repository. Most of the 14 countries that have not established target dates rely on centralized interim storage, which may include a protracted period of onsite storage before shipment to a centralized facility.[7]

In 1997, the United Kingdom (UK) rejected an application for the construction of a rock characterization facility at Sellafield, leaving the country without a path forward for long-term management or disposal of either intermediate-level waste or spent nuclear fuel. In 1998, an inquiry by the UK House of Lords endorsed geologic disposal but specified that public acceptance was required. As a result, the UK Government embraced a repository plan based on the principles of voluntarism and partnership between communities and implementers. This led to the initiation of a national public consultation and major structural reorganization within the UK program. The UK Nuclear Decommissioning Authority envisions availability of a geologic disposal facility for intermediate-level waste in 2040 and a geologic facility for spent nuclear fuel and high-level radioactive waste in 2075; however, there have been changes in societal acceptance in the UK for the siting of a geological disposal facility. In 2007, the Scottish Government officially rejected any further consultation with the UK Government on deep geologic disposal of high-level radioactive waste and spent nuclear fuel. This action by the Scottish Government effectively ended more than 7 years of consultations with stakeholders near Scottish nuclear installations. In 2013, the Cumbria County Council voted to withdraw from the UK process to find a host community for an underground radioactive waste disposal facility and to end the site selection process in west Cumbria.

In Germany, a large salt dome at Gorleben had been under study since 1977 as a potential spent nuclear fuel repository. After decades of intense discussions and protests, the utilities and the government reached an agreement in 2000 to suspend exploration of Gorleben for at least 3, and at most 10 years. In 2003, the Federal Ministry for the Environment set up an interdisciplinary expert group to identify, with public participation, criteria for selecting new candidate sites. In October 2010, Germany resumed exploration of Gorleben as a potential spent nuclear fuel repository. In March 2013, Germany announced plans to form a 24-member commission to develop siting criteria. The Commission will hold public meetings through 2015 on the issue of a permanent repository for high-level nuclear waste.

Initial efforts in France, during the 1980s, also failed to identify potential repository sites, using solely technical criteria. Failure of these attempts led to the passage of nuclear waste legislation that prescribed a period of 15 years of research. Reports on generic disposal options in clay and granite media were prepared and reviewed by the safety authorities in 2005. In 2006, conclusions from the public debate on disposal options, held in 2005, were published. Later that year, the French Parliament passed new legislation designating a single site for deep geologic disposal of intermediate- and high-level radioactive waste. This facility, to be located in the Bure region of northeastern France, is scheduled to open in 2025, about 34 years after passage of the original Nuclear Waste Law of 1991.

In Switzerland, after detailed site investigations in several locations, the Swiss National Cooperative for Radioactive Waste Disposal proposed, in 1993, a deep geologic repository for low- and intermediate-level waste at Wellenberg. Despite a 1998 finding by Swiss authorities that technical feasibility of the disposal concept was successfully demonstrated, a public cantonal referendum rejected the proposed repository in 2002. Even after more than 25 years of high quality field and laboratory research, Swiss authorities do not expect that a deep geologic repository will be available before 2040.

In 1998, an independent panel reported to the Governments of Canada and Ontario on its review of Atomic Energy of Canada Ltd.'s concept of geologic disposal (Canadian Nuclear Fuel Waste Disposal Concept Environmental Assessment Panel, *Report of the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel,* February 1998). (Note that reports related to the Canadian program are available at *www.nrcan.gc.ca.*) The panel found that from a technical

[7] The three countries with target dates that plan direct disposal of spent fuel are: Czech Republic (2050), Finland (2020), and Sweden (2025). The seven countries with target dates for disposal of reprocessed spent fuel and high-level radioactive waste are: Belgium (2035), China (2050), France (2025), Germany (2025), Japan (2030s), Netherlands (2103), and Switzerland (2042).

perspective, safety of the concept had been adequately demonstrated but from a social perspective, it had not. The panel concluded that broad public support is necessary in Canada to ensure the acceptability of a concept for managing nuclear fuel wastes. The panel also found that technical safety is a key part, but only one part, of acceptability. To be considered acceptable in Canada, the panel found that a concept for managing nuclear fuel wastes must: (1) Have broad public support; (2) be safe from both a technical and social perspective; (3) have been developed within a sound ethical and social assessment framework; (4) have the support of Aboriginal people; (5) be selected after comparison with the risks, costs, and benefits of other options; and (6) be advanced by a stable and trustworthy proponent and overseen by a trustworthy regulator. Resulting legislation mandated a nationwide consultation process and widespread organizational reform.

In 2007, the Government of Canada announced its selection of the Adaptive Phased Management approach and directed the Nuclear Waste Management Organization (NWMO) to take at least 2 years to develop a ''collaborative community-driven site-selection process.'' The NWMO will use this process to open consultations with citizens, communities, Aboriginals, and other interested parties to find a suitable site in a willing host community. For financial planning and cost estimation purposes only, the NWMO assumes the availability of a deep geological repository in 2035, 27 years after initiating development of new site selection criteria, 30 years after embarking on a national public consultation, and 37 years after rejection of the original geologic disposal concept (NWMO, *Annual Report 2007: Moving Forward Together,* March 2008). NWMO developed a site selection process with public input and launched the process in 2010. At the end of 2012, 21 communities had expressed interest in learning more about the project (NWMO, *Annual Report 2012: Learning More Together,* March 2013).

Repository development programs in Finland and Sweden are further along than in other countries but have taken time to build support from potential host communities. In Finland, preliminary site investigations started in 1986, and detailed characterizations of four locations were performed between 1993 and 2000. In 2001, the Finnish Parliament ratified the Government's decision to proceed with a repository project at a chosen site only after the 1999 approval by the municipal council of the host community. In December 2012, Posiva (the nuclear waste management company in Finland) submitted a construction license application for a final repository that will hold spent nuclear fuel from Finland's nuclear reactors. Finland expects this facility to begin receipt of spent nuclear fuel for disposal in 2020, 34 years after the start of preliminary site investigations.

Between 1993 and 2000, Sweden conducted feasibility studies in eight municipalities. One site was found technically unsuitable, and two sites were eliminated by municipal referenda. Three of the remaining five sites were selected for detailed site investigations. Municipalities adjacent to two of these sites agreed to be potential hosts and one refused. Since 2007, detailed site investigations were conducted at both Östhammar and Oskarshamn, both of which already host nuclear power stations. On June 3, 2009, the Swedish Nuclear Fuel and Waste Management Company, SKB, selected the Forsmark Site located in the Östhammar municipality for the Swedish spent nuclear fuel repository. The SKB submitted a license application in spring 2011. A government decision is expected in 2015. If Swedish authorities authorize construction, the repository could be available for disposal around 2025, about 30 years after feasibility studies began.

Based on international experience, 25–35 years is a reasonable estimate for the amount of time necessary to site, license, and open a geologic repository. The time DOE will need to develop a repository site will depend upon a variety of factors, including the passage of any required enabling legislation and budgeted funding. Broader institutional issues also bear on the time it takes to implement geologic disposal. Given this uncertainty, the DGEIS evaluates a range of scenarios for the timeframe of the development of a repository, including indefinite storage.

The DOE is currently the agency responsible for carrying out the national policy to site and build a repository, which includes designing, constructing, operating, and decommissioning the repository. The NRC, on the other hand, is the agency responsible for reviewing, licensing, and overseeing the construction and operation of the repository. The DOE Strategy Report states that it is the Administration's goal to have a repository sited by 2026, licensing to be complete by 2042, and the repository constructed and open for operations by 2048. The total of 35 years is consistent with international efforts and estimates of between 25 and 35 years to site, license, construct, and open a repository.

Before DOE can start the development of a new site, Congress will need to provide additional direction, beyond the current NWPA, for the long-term management and disposal of spent nuclear fuel and high-level radioactive waste. Whatever approach Congress mandates, international and domestic experience since 1990 suggests that greater attention needs to be paid to developing societal and political acceptance in concert with essential technical, safety, and security assurances. While there is no technical basis for making precise estimates of the minimum time needed to accomplish these objectives, examination of the international examples cited previously would support a range of between 25 and 35 years. The Commission believes that societal and political acceptance must occur before a successful repository program can be completed, and that this is unlikely to occur until a Federal decision is made, whether for technical, environmental, political, legal, or societal reasons, that will allow the licensing and construction of a repository to proceed. The BRC Report recommended using a siting process that is consent-based. In response to the BRC report, the DOE Strategy Report includes a strategy that includes the establishment of a consent-based siting process.

As discussed in this section, geologic disposal continues to be the favored disposition path both nationally and internationally. Moreover, geologic disposal has moved significantly beyond a theoretical concept as demonstrated by: (1) Submission of a license application for a potential repository at Yucca Mountain and the NRC conducting a technical review of that application; (2) submission on December 28, 2012, of a construction license application by Posiva for a final repository that will hold spent nuclear fuel from Finland's nuclear reactors; and (3) submission in spring 2011, of an application by SKB for permission to build a repository for spent nuclear fuel in Sweden. Additionally, a deep geologic repository for defense-related transuranic radioactive wastes in Carlsbad, New Mexico (WIPP) began disposal operations in March 1999. Based on all the information in this section and Appendix B of the DGEIS, the Commission concludes that a geologic repository is technically feasible.

In picking a timeframe by which the Commission has confidence that a

geologic repository can be available, the Commission is not concluding that it supports storage of spent nuclear fuel for an indefinitely long period. United States law supports the objective of timely disposal of spent nuclear fuel and high-level radioactive waste in a geologic repository. However, spent nuclear fuel will need to be stored for several decades at either reactor sites or at away-from-reactor sites beyond the licensed life for operations before ultimate disposal in a geologic repository. Having considered all the available information, the Commission believes that a reasonable timeframe for repository availability is within 60 years beyond the licensed life for operation of a reactor. Based on international experience, this timeframe is still a reasonable time for the United States to site, license, construct, and open a geologic repository and is longer than the predicted reasonable period of 25 to 35 years to site and develop a repository. Dresden 1 will be the first reactor to reach 60 years beyond licensed life for operations in 2059, which means that a repository would be needed by 2059 to support the short-term continued storage scenario in the GEIS that sufficient repository capacity becomes available by 60 years after the end of a reactor's licensed life for operation. The 2059 date is several years beyond the DOE's estimate of 2048 to site, license, construct, and open a repository. For new reactors, 60 years beyond the licensed life of the reactor would mean that repository capacity would be available in 120 to 140 years. Therefore, the Commission concludes that it is reasonable to assume the availability of a mined geologic repository is feasible within 60 years beyond the licensed life for operating and planned new reactors.

C3. Storage of Spent Nuclear Fuel

Continued storage of spent nuclear fuel at-reactor or away-from-reactor sites will be necessary until a repository is available for permanent disposal. During the continued storage period, the storage of spent nuclear fuel at a storage facility is focused on safe spent nuclear fuel management. Safe spent nuclear fuel management involves a regulatory framework and the technical feasibility of safe storage. The regulatory framework applicable to both wet (spent fuel pool) and dry storage of spent nuclear fuel is discussed in Section C3.a., *Regulatory Framework,* of this document. The technical feasibility of safe storage of spent nuclear fuel in spent fuel pools is discussed in Section C3.b.i., *Technical Feasibility of Wet Storage,* and in dry cask storage in Section C3.b.ii., *Technical Feasibility of Dry Storage,* of this document (*see* also Section B.3 of Appendix B of the DGEIS).

C3.a. Regulatory Framework

A strong regulatory framework that involves regulatory oversight, continuous improvement based on research and operating experience, and licensee compliance with regulatory requirements is important to the continued safe storage of spent nuclear fuel until repository capacity is available. The regulatory framework was previously addressed in Findings 3 and 5. Finding 3 analyzed whether high-level radioactive waste and spent nuclear fuel would be safely managed until repository capacity is available. Finding 5 dealt with whether safe storage capacity would be made available if necessary. The key question of these Findings is whether a regulatory framework exists to ensure the continued safe management of spent nuclear fuel and whether licensees will do what is necessary to safely store their spent nuclear fuel until repository capacity for their spent nuclear fuel is available.

After the end of a reactor's licensed life for operation, the spent nuclear fuel is stored in either spent fuel pools or in dry cask storage. At-reactor storage of spent nuclear fuel in spent fuel pools is covered by a licensee's 10 CFR parts 50 or 52 license. Monitoring of the structural integrity of the spent fuel pool is addressed through aging management programs. In particular, the aging management program focuses on the pool's water chemistry as it relates to the integrity of the stainless steel liner, spent fuel storage racks, and spent-fuel-storage-racks-neutron-absorbing sheets. Currently only one away-from-reactor ISFSI stores spent nuclear fuel in a spent fuel pool—the GEH-Morris facility. The DGEIS assumes that no new away-from-reactor spent fuel pool storage facilities are constructed.

Spent nuclear fuel can also be stored in dry casks in at-reactor ISFSIs licensed by the NRC under either a specific license or a general license or in an away-from-reactor ISFSI under a specific license. Currently there are 69 ISFSIs licensed to operate in 34 States under either specific (15) or general (54) 10 CFR part 72 licenses.[8]

A specific license for an ISFSI under 10 CFR part 72 can be granted by the NRC after a review of the safety, environmental, and physical security aspects of the proposed ISFSI and the financial aspects of the licensee. If the NRC concludes that the ISFSI can operate safely and prepares either an EA and FONSI or EIS, then a license can be issued. This license contains requirements on topics such as leak testing and monitoring and specifies the quantity and type of material the licensee is authorized to store at the site. Neither the initial nor renewal license terms for an ISFSI are to exceed 40 years from the date of issuance. Part 72 of 10 CFR also contains the regulatory framework for licensing a monitored retrievable storage facility should the need arise.

A general license under subpart K of 10 CFR part 72, ''General License for Storage of Spent Fuel at Power Reactor Sites,'' authorizes storage of spent fuel in casks previously approved by the NRC at a site already licensed to possess fuel to operate a nuclear power reactor. Under 10 CFR 72.210, ''General license issued,'' a general license for the storage of spent nuclear fuel in an ISFSI at power reactor sites is issued to those persons authorized to possess or operate nuclear power reactors under 10 CFR parts 50 or 52. The general license is limited to spent nuclear fuel that the general licensee is authorized to possess at the site under the 10 CFR parts 50 or 52 license for the site. The general license is further limited to storage of spent nuclear fuel in casks approved and fabricated under the provisions of subpart L of 10 CFR part 72, ''Approval of Spent Fuel Storage Casks''; the approved cask designs are listed in 10 CFR 72.214, ''List of approved spent fuel storage casks.'' The NRC has approved 34 designs. The NRC conducts a technical review of each cask design before approving the design and listing it in 10 CFR 72.214. After the NRC staff documents its review of the proposed cask design in a safety evaluation report, the NRC conducts a rulemaking, which includes an environmental review, to add the design to the list of approved cask designs. Licensees that use casks with the approved designs must follow the terms of the Certificate of Compliance and the technical specifications for the design. Licensees must demonstrate that it is safe to store spent fuel in dry casks at their site, including analysis of earthquake intensity and tornado missiles. Licensees also review their programs (such as security and emergency planning) and make any changes to

[8] The Private Fuel Storage (PFS) facility was licensed, however, as a result of legal challenges not related to the NRC licensing proceeding, the proposed PFS ISFSI has not been constructed. On December 20, 2012, PFS submitted a request to the NRC to terminate its license (ADAMS Accession No. ML12356A063). As of publication, that request is pending before the agency.

those programs needed to accommodate an ISFSI at their site.

Parts 50, 52, and 72 of 10 CFR all have provisions for site-specific license renewal. The current regulatory framework for storage of spent nuclear fuel allows for multiple license renewals subject to aging management analysis and planning. An applicant for storage license renewal must provide appropriate technical bases for identifying and addressing aging-related effects and develop specific aging management plans to justify extended operations of ISFSIs under the renewed license term. The regulatory framework for storage is supported by well-developed regulatory guidance; voluntary domestic and international consensus standards; research and analytical studies; and processes for implementing licensing reviews, inspection programs, and enforcement oversight.

With respect to decommissioning, as required under 10 CFR 72.30(b), all ISFSI licensees must provide a decommissioning funding plan to demonstrate reasonable assurance that funds will be available to decommission the ISFSI. Further, the NRC's regulations require that every nuclear power reactor operating license issued under 10 CFR part 50 and every combined license issued under 10 CFR part 52 must contain a condition requiring each licensee to submit written notification to the Commission of the licensee's plan for managing irradiated fuel after reactor shutdown. The submittal, required by 10 CFR 50.54(bb), must include information on how the licensee intends to provide funding for the management of its spent nuclear fuel.

In accordance with the license termination requirements for power reactors in 10 CFR 50.82(a)(3) and 52.110(c), decommissioning is to be completed within 60 years of permanent cessation of operations. Completion of decommissioning beyond 60 years will be approved by the NRC only when necessary to protect public health and safety. Factors that will be considered by the Commission include unavailability of waste disposal capacity and other site-specific factors, including the presence of other nuclear facilities at the site. Given this regulatory framework, it may be reasonably assumed that each nuclear power plant, including its onsite spent fuel pool, will be decommissioned within 60 years of permanent cessation of operations. This is the basis for assuming in the DGEIS that all of the spent nuclear fuel from the spent fuel pool is removed from the pool by the end of the short-term timeframe (*see* Section 2.2.1.1 of the DGEIS for more information on decommissioning during the short-term period).

As part of its oversight, the NRC can issue orders and new or amended regulations to address emerging issues that could affect the storage of spent nuclear fuel. For example, following the terrorist attacks of September 11, 2001, the NRC undertook an extensive reexamination of spent nuclear fuel safety and security issues. In 2002, the NRC issued orders to licensees that required power reactors in decommissioning, wet ISFSIs, and dry storage ISFSIs to enhance security and improve their capabilities to respond to, and mitigate the consequences of, a terrorist attack. These orders required additional security measures, including increased patrols, augmented security forces and capabilities, and more restrictive site access controls to reduce the likelihood of a successful terrorist attack. In 2007, the NRC issued a final rule revising the Design Basis Threat, which also increased the security requirements for power reactors and their spent fuel pools (72 FR 12705; March 19, 2007). More recently in March 2009, the NRC issued a final rule to improve security measures at nuclear power reactors, including spent fuel pools (74 FR 13926; March 27, 2009). The NRC also plans to codify enhanced security measures at ISFSIs in a future rulemaking (74 FR 66589; December 16, 2009).

Section 4.19 of the DGEIS describes the environmental impacts of potential acts of sabotage or terrorism involving the continued storage of spent nuclear fuel. The section acknowledges that as the immediate hazard posed by the high radiation levels of spent nuclear fuel diminishes over time, so does the deterrent to handling by unauthorized persons. The NRC will consider this type of information in evaluating whether additional security requirements are warranted in the future.

Other examples of the NRC's oversight are the additional requirements that the NRC has imposed in response to the March 11, 2011, severe earthquake and subsequent tsunami that resulted in extensive damage to the six-unit Fukushima Dai-ichi Nuclear Power Plant in Japan. On March 12, 2012, the NRC issued multiple orders and a request for information to all of its nuclear power plant licensees. The orders addressed mitigating strategies for beyond-design basis external events and reliable spent fuel pool instrumentation. The request for information was designed to gather information to allow the NRC to reevaluate seismic and flooding hazards at operating reactor sites and to determine whether appropriate staffing and communication can be relied upon to coordinate event response during a prolonged station blackout event, as was experienced at Fukushima Dai-ichi.

Another aspect of the NRC's regulatory program for continued storage, as for reactors and other licensed facilities generally, involves generic communications. Generic communications include, but are not limited to, generic letters, bulletins, information notices, safeguards advisories, and regulatory issue summaries. Generic letters request licensee actions and information to address issues regarding emergent or routine matters of safety, security, safeguards, or environmental significance. Bulletins request licensee actions and information to address significant issues regarding matters of safety, security, safeguards, or environmental significance that have great urgency. Both generic letters and bulletins require a written response from the licensee. Information notices are used to communicate operating or analytical experience to the nuclear industry. The industry is expected to review the information for applicability and consider appropriate actions to avoid similar problems. Regulatory issue summaries are used to communicate and clarify the NRC's technical and policy positions on regulatory matters. Neither an information notice nor a regulatory issue summary requires written responses from licensees.

For example, Information Notice 2012–20, ''Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters'' (ADAMS Accession No. ML12319A440), informed licensees about the potential for chloride-induced stress corrosion cracking of austenitic stainless steel and maintenance of dry cask storage system canisters. Although an immediate safety concern did not exist, the NRC alerted licensees and certificate holders that their monitoring programs need to address this concern as part of an aging management program so that appropriate actions (e.g., maintenance) would be taken to avoid the potential problem.

As demonstrated by these examples, the NRC's regulatory framework allows the Agency to respond to emerging events and take appropriate action to continue to protect the public health and safety and the environment.

To date, the NRC has renewed five specific 10 CFR part 72 ISFSI licenses. These renewals include the 10 CFR part 72 specific licenses for the General Electric Morris Operation (the only wet, or pool-type, ISFSI), as well as the Surry, H.B. Robinson, Oconee, and Fort St. Vrain ISFSIs. Specific licenses for all but one of the ISFSIs will expire by 2048. It is expected that license renewals will be requested by the licensees of these facilities, unless a permanent repository or some other interim storage option is made available. The NRC has received renewal applications for the Calvert Cliffs and Prairie Island ISFSIs. Similarly, renewals will be required for certificates of compliance for storage cask designs approved for use by general licensees in accordance with 10 CFR part 72.

In addition, issuance of Materials License No. SNM–2513 for the Private Fuel Storage, LLC (PFS) facility has confirmed the feasibility of licensing an away-from-reactor ISFSI under 10 CFR part 72. Although there were several issues that prevented the PFS ISFSI from being built and operated, the extensive review of safety, security, and environmental issues associated with licensing the PFS facility provides additional confidence that spent nuclear fuel can be safely stored at an away from reactor ISFSI for long periods after storage at a reactor site.

The NRC will continue its regulatory control and oversight of spent nuclear fuel storage at both operating and decommissioned reactor sites for both specific and general 10 CFR part 72 licenses and 10 CFR parts 50 or 52 licenses. Decades of operating experience and ongoing NRC inspections demonstrate that these reactor and ISFSI licensees continue to meet their obligation to safely store spent fuel in accordance with the requirements of 10 CFR parts 50 and 72. If the NRC were to find noncompliance with these requirements or otherwise identify a concern with the safe storage of the spent fuel, the NRC would evaluate the issue and take action to protect the public health and safety and the environment.

As noted in the preceding paragraphs, licensees have continued to develop and successfully use onsite spent nuclear fuel storage capacity in the form of spent fuel pool and dry cask storage. Based on the preceding discussion, licensees should have the necessary resources to meet obligations related to the storage of any spent nuclear fuel after reactor operations cease. The Commission concludes that the regulatory framework exists to support the conclusion that spent nuclear fuel can be managed in a safe manner until sufficient repository capacity is available.

C3.b. Safe Storage of Spent Nuclear Fuel

Finding 4 assessed the safe storage of spent nuclear fuel pending ultimate disposal at a repository. Issues related to storage focus on the technical feasibility of safe storage of spent nuclear fuel. To address the feasibility of long-term safe storage, the Commission needs to evaluate: (1) The technical feasibility of safe wet storage; and (2) the technical feasibility of safe dry storage. The Commission also needs to evaluate the potential risks of accidents and acts of sabotage at spent nuclear fuel storage facilities. Although the DGEIS does not primarily evaluate safety, it does include evaluations of the environmental impacts attributable to accidents, public health, and safeguards for three different timeframes and contains a discussion on the technical feasibility of safe storage, which support the conclusion in the proposed rule that fuel can be safely stored. The technical feasibility of safe storage beyond a reactor's licensed life for operation is addressed in the following sections.

C3.b.i. Technical Feasibility of Wet Storage

The technical feasibility of continued safe wet storage is supported by a number of technical considerations. First, the integrity of spent fuel and cladding under the controlled water chemistry within the spent fuel pool is supported by operating experience as well as a number of scientific studies. Further, the spent fuel pool's robust technical design protects against a range of natural and human-induced challenges. These considerations are discussed in the following paragraphs.

The Commission found in 1984 that research and experience in the United States and other countries confirmed that long-term storage could be safely undertaken (49 FR 34681–34682; August 31, 1984). In 1990, the Commission determined that experience with water storage of spent nuclear fuel continued to confirm that pool storage is a benign environment for spent nuclear fuel that does not lead to significant degradation of spent nuclear fuel integrity and that the pools in which the assemblies are stored will remain safe for extended periods. Further, degradation mechanisms are well understood and allow time for appropriate remedial action (55 FR 38509–38511; September 18, 1990). In sum, based on both experience and scientific studies, the Commission found wet storage to be a fully-developed technology with no associated major technical problems.

Almost 30 years of additional experience has been gained since the publication of the Waste Confidence rulemaking in 1984 during which time the technical basis for very slow degradation rates of spent nuclear fuel in spent fuel pools has continued to grow. For example, several studies have supported the low degradation of cladding material (IAEA TECDOC–1012, *Durability of Spent Nuclear Fuels and Facility Components in Wet Storage,* 1988*;* IAEA TECDOC–1343, *Spent Fuel Performance Assessment and Research: Final Report of a Cordinated Research Project on Spent Fuel Performance Assessment and Research (SPAR) 1997–2001,* 2003; IAEA Technical Report Series No. 443, *Understanding and Managing Ageing of Materials in Spent Fuel Storage Facilities,* 2006). The IAEA TECDOC–1012 noted that ''[t]he zirconium alloys represent a class of materials that is highly resistant to degradation in wet storage, including some experience in aggressive waters. The only adverse experience involves Zircaloy clad metallic uranium where mechanical damage to the cladding was a prominent factor during reactor discharge, exposing the uranium metal fuel to aqueous corrosion. Otherwise, the database for the zirconium alloys supports a judgment of satisfactory wet storage in the time frame of 50 to 100 years or more'' (p. 5). The IAEA TECDOC 1343, in discussing spent nuclear fuel storage experience, reported on a detailed review of the degradation mechanisms of spent nuclear fuel under wet storage and stated that ''wet storage of spent fuel only appears to be limited by adverse pool chemistry conditions or the deterioration of the fuel storage pool structure.''

The IAEA Technical Report Series No. 443 stated that ''[d]estructive and non-destructive examinations of fuel rods, visual evidence and coupon studies [11, 13, 54–58] all support resistance to aqueous corrosion. There have been no reports of fission gas evolution, indicative of cladding failure in wet storage. Rod consolidation campaigns have been conducted without any indication of storage induced degradation. There is a sufficient database to indicate that wet storage of fuel with zirconium alloy cladding can be extended for at least several decades.''

Based on available information and operating experience, degradation of the fuel cladding occurs slowly over time in the spent fuel pool environment. Degradation of the spent nuclear fuel

should be minimal, particularly over the short-term storage period. Therefore, the NRC expects that only routine maintenance will be needed over the short-term storage period. The DGEIS assumes that the spent fuel pool will be decommissioned before the end of the short-term storage period. However, the NRC is not aware of any information that would call into question the technical feasibility of continued safe storage of spent fuel in spent fuel pools beyond the short-term storage period (*see* Section B.3.1 of Appendix B of the DGEIS).

In its initial Waste Confidence Decision, the Commission found that the risks of major accidents at spent fuel pools resulting in offsite consequences were remote because of the secure and stable character of the spent nuclear fuel in the storage pool environment and the absence of reactive phenomena that might result in dispersal of radioactive material. The Commission noted that storage pools and ISFSIs are designed to safely withstand accidents caused by either natural or man-made phenomena (49 FR 34658; pp. 34684–34685; August 31, 1984). By 1990, the NRC staff had spent several years studying the potential for a catastrophic loss of reactor spent fuel pool water, which could lead to a fuel fire. The NRC concluded that, because of the large inherent safety margins in the design and construction of a spent fuel pool, no action was needed to further reduce the risk (55 FR 38472; p. 38511; September 18, 1990).

The NRC has continued its examination of spent fuel pool storage to ensure that adequate safety is maintained and that there are no adverse environmental effects from the storage of spent nuclear fuel in spent fuel pools. In 1997, the safety and environmental effects of spent fuel pool storage were addressed in conjunction with regulatory assessments of permanently shutdown nuclear plants and decommissioning nuclear power plants in NUREG/CR–6451, ''A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants'' (ADAMS Accession No. ML082260098). The study provided reasonably bounding estimates of fuel coolability and offsite consequences for the most severe accidents, which would involve draining of the spent fuel pool.

In 2001, the NRC issued NUREG–1738, ''Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants'' (ADAMS Accession No. ML010430066), which examined spent fuel pool accident risk at decommissioning nuclear power plants and provides a newer and more robust analysis of the safety and environmental effects of spent fuel pool storage. This study provided the results of the NRC staff's latest evaluation of the accident risk in a spent fuel pool at decommissioning plants. The NUREG–1738 found that a postulated accident causing a zirconium cladding fire could result in unacceptable offsite doses; however, the likelihood for such an accident to occur was estimated to be less than three chances in one million (p. 3–29). The NUREG–1738 states: ''[T]he risk at decommissioning plants is low and well within the Commission's safety goals. The risk is low because of the very low likelihood of a zirconium fire even though the consequences from a zirconium fire could be serious.'' (p. 5–3). In arriving at this conclusion, NUREG–1738 considered a wide range of initiating events (pp. 3–2, 3–3), including, but not limited to, events that might lead to rapid loss of pool water, such as seismic events, cask drop, aircraft impact, and missiles generated by tornados. The low probability for these varied events to initiate a rapid loss of water from the pool is a direct result of the robustness of the structural design of the spent fuel pool. The results of NUREG–1738, as well as other studies, are discussed in more detail in Appendix F of the DGEIS. Appendix F also contains information on actions that the NRC has required licensees to take in response to significant events including the September 11, 2001, terrorist attack and the March 11, 2011, Fukushima Dai-ichi event in Japan.

Given the physical robustness of the pools, the physical security measures, and the spent fuel pool mitigation measures, and based upon the NRC's site evaluations of every spent fuel pool in the United States, the NRC has determined that the risk of a spent fuel pool zirconium fire, whether caused by an accident or a terrorist attack, is very low. In addition, the NRC has approved license amendments and issued safety evaluations to incorporate mitigation measures into the plant licensing bases of all operating nuclear power plants in the United States (*see* 73 FR 46207–46208; August 8, 2008; and Sections 4.18, 4.19, 5.18, 5.19, and Appendix F of the DGEIS).

Monitoring of the structural integrity of the spent fuel pool is addressed through aging management programs. All nuclear power plants and GEH-Morris have specific aging management programs to inspect, monitor, detect, and trend the aging of the spent fuel pool structure concrete, liner plate, and structural steel that support different commodities. The aging management program also focuses on the pool's water chemistry as it relates to the integrity of the stainless steel liner, spent fuel storage racks, and spent-fuel-storage-racks-neutron-absorbing sheets.

Another issue related to storage of spent nuclear fuel in a spent fuel pool is possible leakage of water from the pool into the environment. The spent fuel pool liner and the leakage collection system normally prevent spent fuel pool water from leaking into the environment. However, leaks can occur. Available data indicate that spent fuel pool leakage has occurred at several nuclear power plant sites. The DGEIS provides a detailed description and evaluation of the historical data on spent fuel leakage and the offsite environmental impacts that may occur during the period of continued storage. In particular, Appendix E determined the impact to public health from spent fuel pool leakage would be SMALL (*see* Appendix E of the DGEIS for information on spent fuel pool leaks).

In summary, spent fuel pools are massive, seismically-designed structures that are constructed from thick, reinforced concrete walls and slabs designed to be seismically robust. Thus, the likelihood of major accidents at spent fuel pools resulting in offsite consequences is remote. The NRC is not aware of any additional studies that would question the low probability of spent fuel pool accidents and thereby also question the technical feasibility of continued safe storage of spent nuclear fuel in spent fuel pools for the 60 years after licensed life for operation considered in the DGEIS. Further, as described in Appendix E of the DGEIS, the public health Impacts from potential spent fuel pool leaks is SMALL.

C3.b.ii. Technical Feasibility of Dry Storage

The feasibility of safe dry cask storage is supported by years of experience as well as technical studies and the NRC's reviews that have examined and confirmed the integrity of spent nuclear fuel and cladding under the controlled and relatively benign environment within dry cask storage systems and the robustness of the structural design of the dry cask storage system against a variety of challenges both natural and human-induced. Those features are addressed in the following paragraphs and in Section B.3.2 of Appendix B of the DGEIS.

In 1984, the Commission based its findings regarding the safety of dry storage on an understanding of the material degradation processes, derived largely from technical studies, together with the recognition that dry storage

systems are simple and easy to maintain (49 FR 34683–34684; August 31, 1984). By 1990, the NRC and ISFSI licensees had considerable experience with dry storage. The NRC staff's safety reviews of topical reports on storage system designs, the licensing and inspection of dry storage at two nuclear power plant sites under 10 CFR part 72, and the NRC's promulgation of an amendment to 10 CFR part 72 that incorporated a monitored retrievable storage installation (a dry storage facility) into the regulations confirmed the 1984 conclusions on the safety of dry storage (55 FR 38509–38513; September 18, 1990).

Spent fuel has been safely stored in dry casks for more than 25 years. As with wet storage, the overall experience with dry cask storage of similar fuel types, including the cladding, has been similar—slow degradation. Spent nuclear fuel is allowed to cool in a spent fuel pool before being transferred into dry cask storage, which reduces the potential for significant degradation. Recent studies have confirmed the reliability of dry cask storage. For example, a dry cask storage characterization project examined and tested a dry cask storage system. The 2003 Argonne National Laboratories report prepared for the NRC, NUREG/CR–6831, ''Examination of Spent PWR Fuel Rods after 15 Years in Dry Storage'' (ADAMS Accession No. ML032731021), suggested that the spent fuel cladding could viably remain as a barrier to fission product release during extended storage up to 100 years in a dry cask environment (p. xi). These results were for spent fuel with a burnup limit of 35 gigawatt days per metric ton Uranium (GWd/MTU). The IAEA Technical Report Series No. 443 stated that ''[p]ower reactor fuel with zirconium alloy cladding has been placed into dry storage in approximately a dozen countries. The technical basis for satisfactory dry storage of fuel clad with zirconium alloys includes hot cell tests on single rods, whole assembly tests, demonstrations using casks loaded with irradiated fuel assemblies and theoretical analysis.''

Although the current record for dry cask storage supports the technical feasibility of continued safe storage, the NRC constantly works to investigate and monitor the behavior of the spent fuel storage systems to identify any unexpected and deleterious safety conditions before a problem develops. The NRC is aware of concerns regarding the potential detrimental effects of hydride reorientation on cladding behavior, such as reduced ductility. Reduced ductility, making the cladding more brittle, increases the difficulty of keeping spent nuclear fuel assemblies intact during handling operations and transportation. Research performed in Japan and the United States indicated that: (1) Hydrides could reorient at a significantly lower stress than previously believed and (2) high burn-up fuel could exhibit a higher ductile-to-brittle transition temperature due to the presence of radial hydrides (Billone, M.C., T.A. Burtseva, and R.E. Einziger.2013 ''Ductile-to-Brittle Transition Temperature for High-Burnup Cladding Alloys Exposed to Simulated Drying-Storage Conditions.'' Journal of Nuclear Materials 433(1–3): 431–448 (available at *http://www.sciencedirect.com/science/article/pii/S0022311512005181*)). This phenomenon could influence the approach used for re-packaging spent nuclear fuel, but the NRC is not aware of information that would require the NRC to conclude that high burn-up fuel would need to be repackaged during the short-term time period in the DGEIS. Should spent fuel cladding be more brittle, greater care could be required during handling operations, regardless of when repackaging would occur, to limit the potential for damage to spent nuclear fuel assemblies that could affect easy retrievability of the spent nuclear fuel and complicate repackaging operations.

Based on available information and operating experience, degradation of the spent nuclear fuel should be minimal over the short-term storage period, if the conditions inside the canister are appropriately maintained (*i.e.,* consistent with the technical specifications for storage). Thus, as discussed in more detail in the DGEIS, it is expected that only routine maintenance will be needed over the short-term storage period and no re-packaging is anticipated during that timeframe (i.e., no large-scale repacking of dry cask storage systems). The DGEIS assumes that the repackaging of spent nuclear fuel would occur every 100 years if storage continues beyond the short-term storage period, which may include different approaches for repackaging at times significantly beyond the short-term storage period (*e.g.,* placement of damaged spent nuclear fuel in smaller canisters). The NRC is not aware of any additional studies that would question the technical feasibility of continued safe storage of spent nuclear fuel in dry casks for the time periods considered in the DGEIS.

In 2007, the NRC published a pilot probabilistic risk assessment methodology that assessed the risk to the public and identified the dominant contributors to risk associated with a welded canister dry spent fuel storage system at a specific boiling water reactor site (NUREG–1864, ''A Pilot Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant'' March 2007 (ADAMS Accession No. ML071340012)). The NRC study developed and assessed a comprehensive list of initiating events, including dropping the cask during handling and external events during onsite storage (such as earthquakes, floods, high winds, lightning strikes, accidental aircraft crashes, and pipeline explosions) and reported that the analyses indicate that the risk is solely from latent cancer fatalities and that the overall risk of dry cask storage was found to be extremely low. (The NRC determined that the estimated aggregate risk is an individual probability of a latent cancer fatality of 1.8×10^{-12} during the period encompassing the initial cask loading and first year of service and 3.2×10^{-14} per year during subsequent years of storage (p. 9–2).)

Several characteristics of dry cask storage contribute to the low risk associated with dry cask storage. First, these systems are passive. Second, they rely on natural air circulation for cooling during storage of the spent nuclear fuel. Third, they are inherently robust, massive concrete and steel structures that are highly damage resistant. The robustness of these dry cask storage systems has been tested by significant challenges, such as the 2011 Mineral, Virginia earthquake that affected North Anna Nuclear Plant and the 2011 earthquake and tsunami that damaged the Fukushima Dai-ichi Nuclear Power Plant. Neither event resulted in significant damage to or the release of radionuclides from the dry cask storage containers. The NRC and licensee experience to date with ISFSIs and with certification of casks indicates that interim storage of spent nuclear fuel at reactor sites can be safely and effectively conducted using passive dry storage technology. Although routine inspections have identified several performance issues for individual dry storage components (such as problems with cask seals and concrete cracking), prompt mitigation of these issues has prevented any safety problems from occurring. If problems were to occur, the NRC would take appropriate action to address the problem and verify that licensees take corrective actions to prevent recurrence.

Therefore, technical studies and practical operating experience to date confirm the physical integrity of dry cask storage structures and thereby

demonstrate the technical feasibility of continued safe storage of spent nuclear fuel in dry cask storage systems for the time periods considered in the DGEIS. The DGEIS conservatively assumes that the dry casks would need to be replaced if storage continues beyond the short-term time period. The DGEIS considers replacement of dry casks after 100 years of service life, even though studies and experience to date do not preclude a longer service life. The NRC continues to perform technical studies, evaluate aging management programs, and provide oversight of dry cask storage operations. The NRC will be able to update its service life conclusions as necessary and consider any circumstances that might require repackaging of spent fuel earlier than anticipated.

C3.b.iii. Summary of Technical Feasibility of Spent Nuclear Fuel Storage

In summary, storage of spent nuclear fuel will be necessary until a repository is available for permanent disposal. The storage of spent nuclear fuel in any combination of storage in spent fuel pools or dry casks will continue as a licensed activity under regulatory controls and oversight. Licensees continue to develop and successfully use onsite spent nuclear fuel storage capacity in the form of spent fuel pools and dry cask storage in a safe and environmentally sound fashion. Technical understanding and experience continues to support the technical feasibility of safe storage of spent nuclear fuel in spent fuel pools and in dry casks, based on their physical integrity over long periods of time (*e.g.,* slow degradation of spent fuel during storage in spent fuel pools and dry casks and engineered features of storage pools and dry casks to safely withstand accidents caused by either natural or man-made phenomena). Additionally, regulatory oversight has been shown to enhance safety designs and operations as concerns and information evolve over time (*e.g.,* security and safety enhancements made after the September 11, 2001, terrorist attacks and the March 2011 Fukushima Dai-ichi disaster and corrective actions to address spent fuel pool leaks are discussed in Appendix E of the DGEIS).

Based on the technical information and the national and international experience with wet and dry storage of spent fuel, the NRC believes that it is technically feasible to safely and securely store spent fuel in either wet or dry storage for at least 60 years beyond a reactor's licensed life for operation with only routine maintenance (*i.e.,* no large-scale replacement of spent fuel pools or dry cask storage systems). This time period represents a potential service life for the spent fuel pools and dry cask storage systems on the order of 100 to 140 years when considering any storage that occurs during reactor operations. The Commission concludes that spent fuel can continue to be safely managed in spent fuel pools and dry casks and that regulatory oversight exists to ensure the aging management programs continue to be updated to address the monitoring and maintenance of structures, systems, and components that are important to safety. Based on all of the information set forth in Appendix B of the DGEIS and Section III.C3., *Storage of Spent Nuclear Fuel,* of this document, the Commission concludes that spent nuclear fuel can be safely managed in spent fuel pools in the short-term timeframe and dry casks during the short-term, long-term, and indefinite timeframes evaluated in the DGEIS.

IV. Additional Issues for Public Comment

The Commission is specifically seeking comment on four issues:

Issue 1: The Commission seeks comment on whether specific policy statements regarding the timeline for repository availability should be removed from the rule text. The Commission's proposed revisions to 10 CFR 51.23 include statements regarding the feasibility of safe continued spent nuclear fuel storage and the timeframe for the availability of a repository. These conclusions are supported by the analysis contained in Appendix B of the DGEIS. Although conclusions about repository availability have been included in Waste Confidence proceedings since 1984, these statements are not necessary to the environmental review or for fulfilling the NRC's NEPA obligations. There are national policy decisions, and societal and political factors that can significantly influence the actual timing of the availability of mined geologic repository, and these policy decisions are outside the Commission's control.

Issue 2: The Commission seeks public comment on whether specific policy statements regarding the safety of continued spent fuel storage should be made in the rule text given the expansive and detailed information in the DGEIS. Historically, a policy statement related to the safety of continued storage has been included in the Waste Confidence proceedings since 1984. However, the policy statement on safety is not related to, or necessary for, the generic determination on environmental impacts of continued storage, nor does it provide the safety analysis for storage in a particular dry cask or storage at a particular site: A safety evaluation is still required to support approval of new cask designs, to support a site-specific license for dry storage, or to store spent nuclear fuel in a spent fuel pool.

The DGEIS analyzes the impacts from continued storage of spent nuclear fuel and makes generic determinations of the foreseeable environmental impacts stemming from continued storage; the proposed rule codifies the conclusions from the DGEIS so that those determinations do not need to be made in individual actions. This rule is not a licensing decision for nuclear power plants or ISFSIs, or for the renewal of those licenses. The rule does not authorize the storage of spent nuclear fuel in spent fuel pools or ISFSIs.

Issue 3: The Commission seeks public comment on whether the Discussion portion (Section III of this document) of the Statement of Considerations should be streamlined by removing content that is repeated from the DGEIS in order to improve clarity of the discussion, now that the NRC has prepared an EIS to support the rule.

Issue 4: Finally, the Commission is seeking specific comment on whether the title of the rule should be changed in light of a GEIS being issued instead of a separate Waste Confidence Decision.

V. Discussion of Proposed Amendments by Section

Section 51.23 Environmental Impacts of Storage of Spent Nuclear Fuel Beyond the Licensed Life for Operation of a Reactor

The title of the section would be revised to reflect that the section is no longer based on an EA and FONSI, but on an EIS and that environmental effects of continued storage are included in the section.

Paragraph (a) of 10 CFR 51.23 would be revised to provide the Commission's generic determination on the continued storage of spent nuclear fuel. The proposed amendments would state that the Commission has developed a generic environmental impact statement (NUREG–2157). The proposed rule would further indicate that the Commission has concluded that the analysis generically addresses the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor and supports the determinations that it is feasible to safely store spent nuclear fuel beyond the licensed life for

operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor.

Paragraph (b)(1) of 10 CFR 51.23 would be revised to clarify that ISFSI license renewals are included in the scope of the generic determination.

Section 51.61 Environmental Report—Independent Spent Fuel Storage Installation (ISFSI) or Monitored Retrievable Storage Installation (MRS) License

Section 51.61 of 10 CFR would be revised to clarify that ISFSI renewals are included in the scope of the generic determination in 10 CFR 51.23.

Section 51.80 Draft Environmental Impact Statement—Materials License

Paragraph (b) of 10 CFR 51.80 would be revised to clarify that ISFSI renewals are included in the scope of the generic determination in 10 CFR 51.23.

Section 51.97 Final Environmental Impact Statement—Materials License

Paragraph (a) of 10 CFR 51.97 would be revised to clarify that ISFSI renewals are included in the scope of the generic determination in 10 CFR 51.23.

Table B–1—Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants

Table B–1 addresses the environmental impacts of license renewal activities by resource area. When the Commission issued the final rule on the environmental effects of license renewal (78 FR 37282; June 20, 2013), it was not able to rely on the Waste Confidence rule for two of the issues. The Commission noted that upon issuance of the GEIS and rule, the NRC would make any necessary conforming changes to the license renewal rule. This proposed rule would revise these two Table B–1 finding column entries to address Waste Confidence. The ''Offsite radiological impacts of spent nuclear fuel and high-level waste disposal'' issue would be reclassified as a Category 1 impact and the finding column entry would be revised to address Waste Confidence. For the ''Onsite storage of spent nuclear fuel'' issue, the finding column entry would be revised to include the period of continued storage beyond the licensed life for operation of a reactor. Additionally footnote 7 of Table B–1 would be removed. While footnotes 1, 2, and 3 are laid out in the regulatory text, they are not being amended but are included to meet an Office of the Federal Register publication requirement.

VI. Availability of Documents

The NRC is making the documents identified in the following table available to interested persons through one or more of the methods provided in Section I.A., *Accessing Information,* of this document, as indicated.

References are also available through the Waste Confidence Decision Web site at *www.nrc.gov.* References are organized by the document in which the reference appears (DGEIS chapter and appendix and the proposed rule **Federal Register** notice), and in alphabetical order by author with links to electronically available documents.

Document	PDR	Web (*www.regulations.gov* unless otherwise indicated)	ADAMS
Waste Confidence Related Documents			
Federal Register notice—Notice of Intent Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation (77 FR 65137; October 25, 2012).	X	X	ML12305A035.
Draft NUREG-2157, ''Waste Confidence Generic Environmental Impact Statement''.	X	X	ML13224A106.
''Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report''.	X	X	ML13060A128.
''Scoping Comments on the Waste Confidence Generic Environmental Impact Statement''.	X	X	ML13060A130.
Transcript of November 14, 2012, Waste Confidence Scoping Meeting—Afternoon Session.	X	X	ML12331A347.
Transcript of November 14, 2012, Waste Confidence Scoping Meeting—Evening Session 9pm–12am.	X	X	ML12331A353.
Transcript of Scoping Meeting for the Waste Confidence Environmental Impact Statement: Webinar December 5, 2012.	X	X	ML12355A174.
December 6, 2012 Waste Confidence Scoping Webinar Transcript.	X	X	ML12355A187.
Minnesota v. *NRC,* 602 F.2d 412 (D.C. Cir. 1979)	.....	*http://scholar.google.com/scholar_case?case=155447492178518_99941.* **Note:** this link directs the reader to an unofficial copy of this case.	
(*New York* v. *NRC,* 681 F.3d 471 (D.C. Cir. 2012)	.....	*http://www.cadc.uscourts.gov/internet/opinions.nsf/57ACA94A8FFAD8AF85257A1700502AA4/$file/11-1045-1377720.pdf.*	
Federal Register notice announcing generic proceeding on Waste Confidence (44 FR 61372, 61373; October 25, 1979).	X		
Federal Register notice—1984 Waste Confidence Final Rule (49 FR 34688; August 31, 1984).	X	.....	ML033000242.

Document	PDR	Web (*www.regulations.gov* unless otherwise indicated)	ADAMS
Federal Register notice—1984 Final Waste Confidence Decision (49 FR 34658; August 31, 1984).	X	.....	ML033000242.
Federal Register notice—1990 Waste Confidence Final Rule (55 FR 38472; September 18, 1990).	X	.....	ML031700063.
Federal Register notice—1990 Waste Confidence Decision (55 FR 38474; September 18, 1990).	X	.....	ML031700063.
Federal Register notice—1999 Waste Confidence Decision Review (64 FR 68005; December 6, 1999).	X	.....	ML003676331.
Federal Register notice—2010 Waste Confidence Final Rule (75 FR 81037; December 23, 2010).	X	.....	ML103350175.
Federal Register notice—2010 Waste Confidence Decision Update (75 FR 81032; December 23, 2010).	X	.....	ML120970147.
Commission Order CLI–12–16	X	.....	ML12220A094.
SRM–COMSECY–12–0016—Approach for Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule.	X	.....	ML12250A032.
Waste Confidence References—NRC Documents			
Federal Register notice announcing the 1977 Denial of PRM–50–18 (42 FR 34391; July 5, 1977).	X		
Federal Register notice—Final Rule to Amend 10 CFR 73.1: Design Basis Threat (72 FR 12705; March 19, 2007).	X	.....	ML070520692.
Federal Register notice—Power Reactor Security Requirements Final Rule (74 FR 13926; March 27, 2009).	X	.....	ML083380546.
Federal Register notice—Denial of Petitions for Rulemaking (PRM–51–10 and PRM–51–12) (73 FR 46204: August 8, 2008).	X	.....	ML081890124.
Federal Register notice—''Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW; Notice of Availability and Solicitation of Public Comments'' (74 FR 66589; December 16, 2009).	X	.....	ML093340103.
Federal Register notice—Decommissioning Planning Rule (76 FR 35512; June 17, 2011).	X	.....	ML103510117.
Federal Register notice—License Renewal GEIS Final Rule (78 FR 37282: June, 20, 2013).	X	.....	ML13101A059.
Department of Energy; Notice of Acceptance for Docketing of a License Application for Authority to Construct a Geologic Repository at a Geologic Repository Operations Area at Yucca Mountain, Nevada (73 FR 53284; September 15, 2008).	X	.....	ML082490757.
NUREG–0586,''Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1: Regarding the Decommissioning of Nuclear Power Reactors,'' Volume 1 Main report. November 2002.	X	.....	ML023500395.
NUREG–1437, ''Generic Environmental Impact Statement for License Renewal of Nuclear Plants'' 2013.	.....	.....	ML13106A241 for main volume 1, ML13106A242 for volume 2, and ML13106A244 for volume 3.
NUREG–1738, ''Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants''.	X	.....	ML010430066.
NUREG–1864, ''A Pilot Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant''.	X	.....	ML071340012.
NUREG–2107, ''Technical Evaluation Report on the Content of the U.S. Department of Energy's Yucca Mountain Repository License Application—Postclosure Volume: Repository Safety After Permanent Closure''.	X	.....	ML11223A273.
NUREG–2108, ''Technical Evaluation Report on the Content of the U.S. Department of Energy Yucca Mountain Repository License Application—Preclosure Volume: Repository Safety Before Permanent Closure''.	X	.....	ML11250A093.
NUREG/CR–6451, ''A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear Power Plants''.	.....	*http://www.osti.gov/bridge/servlets/purl/510336-qmwPBP/webviewable/510336.pdf.*	
NUREG/CR–6831, ''Examination of Spent PWR Fuel Rods after 15 Years in Dry Storage''.	.....	.....	ML032731021.
Regulatory Guide 4.22, Decommissioning Planning During Operations.	X	.....	ML12158A361.

Document	PDR	Web (*www.regulations.gov* unless otherwise indicated)	ADAMS
NRC Information Notice IN 2012–20, ''Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters''.	X	.....	ML12319A440.
NRC Order Number EA–12–049, Issuance of Order to Modify Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events.	.....	.....	ML12054A735.
NRC Order EA-12-051, Issuance of Order to Modify Licenses With Regard to Reliable Spent Fuel Pool Instrumentation.	.....	.....	ML12054A679.
Luminant Generation Co. LLC (Comanche Peak Nuclear Power Plant, Units 3 and 4), et al., CLI–12–7, 75 NRC 379, 391–92 (March 16, 2012).	X	.....	ML12076A190.
Waste Confidence References—Non-NRC Documents			
NRDC v. *NRC*, 582 F.2d 166 (2d Cir. 1978)	.....	*http://scholar.google.com/scholar_case?case=1292280692394324643*. **Note:** This link directs the reader to an unofficial copy of this case.	
Village of Bensenville v. *Federal Aviation Administration,* 457 F.3d 52, 71–72 (D.C. Cir. 2006).	.....	*http://scholar.google.com/scholar_case?case=6559910666849441800*. **Note:** This link directs the reader to an unofficial copy of this case.	
Marsh v. *Oregon Natural Resources Council,* 490 U.S. 360, 374 (1989).	.....	*http://scholar.google.com/scholar_case?case=10887052189863115558&q*. **Note:** This link directs the reader to an unofficial copy of this case.	
Nuclear Waste Policy Act 96 Stat. 2201 (1983) (current version at 42 U.S.C. 10132 (2006)).	.....	*http://www.epw.senate.gov/nwpa82.pdf*.	
Blue Ribbon Commission on America's Nuclear Future, Report to the Secretary of Energy.	X	.....	ML120970375.
DOE, Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste.	X	.....	ML13011A138.
DOE Yucca Mountain FEIS, ''Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County Nevada'' (Yucca Mountain FEIS)).	X	.....	ML081750212.
Letter from J M Maddox, Eddy-Lea Energy Alliance, LLC, to C Haney, NMSS, re Notice of Intent to Submit a License Application for Consolidated Used Nuclear Fuel Storage Facility, February 26, 2013.	X	.....	ML13067A278.
DOE Motion to Withdraw Application for Yucca Mountain	X	.....	ML100621397.
Request for Termination of NRC License No. SNM–2513 for Private Fuel Storage LLC.	X	.....	ML12356A063.
Billone, M.C., T.A. Burtseva, and R.E. Einziger. 2013 ''Ductile-to-Brittle Transition Temperature for High-Burnup Cladding Alloys Exposed to Simulated Drying-Storage Conditions.'' Journal of Nuclear Materials 433(1–3): 431–448.	.....	*http://www.sciencedirect.com/science/article/pii/S0022311512005181*.	
IAEA, ''Scientific and Technical Basis for the Geologic Disposal of Radioactive Wastes, Technical Reports Series No. 413''.	.....	*http://www-pub.iaea.org/MTCD/Publications/PDF/TRS413_web.pdf*.	
IAEA Technical Report Series No. 443, ''Understanding and Managing Ageing of Materials in Spent Fuel Storage Facilities''.	.....	*http://www-pub.iaea.org/MTCD/publications/PDF/TRS443_web.pdf*.	
IAEA, ''Radioactive Waste Management Studies and Trends, IAEA/WMDB/ST/4''.	.....	*http://www-pub.iaea.org/MTCD/Publications/PDF/WMDB-ST-4.pdf*.	
IAEA TECDOC–1012, ''Durability of Spent Nuclear Fuels and Facility Components in Wet Storage''.	.....	*http://www-pub.iaea.org/MTCD/publications/PDF/te_1012_prn.pdf*.	
IAEA, ''The Use of Scientific and Technical Results from Underground Research Laboratory Investigations for the Geologic Disposal of Radioactive Waste, IAEA–TECDOC–1243''.	.....	*http://www-pub.iaea.org/MTCD/Publications/PDF/te_1243_prn.pdf*.	

Document	PDR	Web (*www.regulations.gov* unless otherwise indicated)	ADAMS
IAEA TECDOC1343, ''Spent Fuel Performance Assessment and Research: Final Report of a Cordinated Research Project on Spent Fuel Performance Assessment and Research (SPAR). 1997–2001''	.....	*http://www-pub.iaea.org/MTCD/publications/PDF/te_1343_web.pdf.*	
IAEA, ''Joint Convention on Safety of Spent Fuel Management and on Safety of Radioactive Waste Management, INFCIRC/546''.	.....	*http://www.iaea.org/Publications/Documents/Infcircs/1997/infcirc546.pdf.*	
Organisation for Economic Cooperation and Development, Nuclear Energy Agency, ''Lessons Learnt from Ten Performance Assessment Studies,'' 1997.	.....	*http://www.oecd-nea.org/rwm/reports/1997/ipag.pdf.*	
Organisation for Economic Cooperation and Development, Nuclear Energy Agency, ''Moving Forward with Geological Disposal of Radioactive Waste,'' 2008.	.....	*http://www.oecd-nea.org/rwm/reports/2008/nea6433-statement.pdf.*	
Canadian Nuclear Fuel Waste Disposal Concept Environmental Assessment Panel, *Report of the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel.*	.....	*http://www.ceaa.gc.ca/default.asp?lang=En&n=0B83BD43-1&xml=0B83BD43-93AA-4652-9929-3DD8DA4DE486&toc=show.*	
NWMO, *Annual Report 2007: Moving Forward Together*	.....	*http://www.nwmo.ca/uploads_managed/MediaFiles/327_NWMO_2007_Annual_Report_E.pdf.*	
NWMO, *Learning More Together—Annual Report for 2012* ..	.....	*http://nwmo.ca/uploads_managed/MediaFiles/2089_ar2012_english_web.pdf.*	

VII. Agreement State Compatibility

Under the ''Policy Statement on Adequacy and Compatibility of Agreement State Programs'' approved by the Commission on June 30, 1997, and published in the **Federal Register** (62 FR 46517; September 3, 1997), this proposed rule would be classified as Compatibility Category ''NRC.'' The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the Atomic Energy Act of 1954, as amended, or the provisions of Title 10 of the CFR. These program elements are not adopted by Agreement States.

VIII. Plain Writing

The Plain Writing Act of 2010 (Pub. L. 111–274) requires Federal agencies to write documents in a clear, concise, and well-organized manner. The NRC has written this document to be consistent with the Plain Writing Act as well as the Presidential Memorandum, ''Plain Language in Government Writing,'' published June 10, 1998 (63 FR 31883). The NRC requests comment on the proposed rule with respect to the clarity and effectiveness of the language used.

IX. Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995 (Pub. L. 104–113) requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this proposed rule, the NRC would modify its generic determination on the consideration of environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for reactor operations. The NRC is not aware of any voluntary consensus standards that address the proposed subject matter of this proposed rule. The NRC will consider using a voluntary consensus standard if an appropriate standard is identified. If a voluntary consensus standard is identified for consideration, the submittal should explain why the standard should be used.

X. Draft Environmental Impact Statement: Availability

As required by the National Environmental Policy Act of 1969, as amended, and the NRC's regulations in subpart A of 10 CFR part 51, the NRC has prepared a Draft Generic Environmental Impact Statement (NUREG–2157) to support this proposed rule. Concurrently with this proposed rule, the NRC published a document requesting comment on NUREG–2157 (same NRC Docket ID as this proposed rule, NRC–2012–0246) in the Proposed Rule section of this issue of the **Federal Register**. In addition, an interested person may access this environmental impact statement as indicated under Section VI of this document, ''Availability of Documents.''

The NRC requests public comment on the DGEIS. The NRC has sent a copy of the DGEIS and this proposed rule to every State Liaison Officer and requested their comments on the draft statement.

XI. Paperwork Reduction Act Statement

This proposed rule does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval number 3150–0021.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

XII. Regulatory Analysis

A draft regulatory analysis has not been prepared for this proposed regulation because this regulation does not establish any requirements that would place a burden on licensees. A cost-benefit analysis of the alternatives considered in the DGEIS was prepared as part of the DGEIS (Chapter 7). If continued storage of spent nuclear fuel beyond the licensed life for operations

must be assessed in site-specific licensing actions, the primary costs accrue to the NRC and to licensees and license applicants. Licensees and license applicants ultimately shoulder the majority of costs incurred to the NRC in the course of licensing actions through the NRC's license-fee program. Costs also accrue through the NRC's adjudicatory activities, which affect the NRC, licensees, license applicants, and petitioners or intervenors. The DGEIS contains an estimate that it could cost over $24 million to address continued storage in site-specific proceedings.

XIII. Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule would not, if promulgated, have a significant economic impact on a substantial number of small entities. The proposed rule would modify the generic determination on the consideration of environmental impacts of continued storage of spent nuclear fuel beyond the end of the licensed life for reactor operations. This generic determination provides that no discussion of any environmental impact of spent nuclear fuel storage in reactor facility storage pools or ISFSIs for the period following the term of the reactor operating license or amendment or initial ISFSI license or amendment for which application is made is required in any environmental report, environmental impact statement, environmental assessment, or other analysis prepared in connection with certain actions. The proposed rule would affect only the licensing of nuclear power plants or ISFSIs. Entities seeking or holding NRC licenses for these facilities do not fall within the scope of the definition of ''small entities'' set forth in the Regulatory Flexibility Act or the size standards established by the NRC at 10 CFR 2.810.

XIV. Backfitting and Issue Finality

The NRC has determined that the backfit rules (§§ 50.109, 70.76, 72.62, or 76.76) and the issue finality provisions in 10 CFR part 52 do not apply to this proposed rule because this amendment does not involve any provisions that will either impose backfits as defined in 10 CFR chapter I, or represent non-compliance with the issue finality of provisions in 10 CFR part 52. Therefore, a backfit analysis is not required for this proposed rule, and the NRC did not prepare a backfit analysis for this proposed rule.

List of Subjects in 10 CFR Part 51

Administrative practice and procedure, Environmental impact statement, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 553; the NRC is proposing to adopt the following amendments to 10 CFR part 51.

PART 51—ENVIRONMENTAL PROTECTION REGULATIONS FOR DOMESTIC LICENSING AND RELATED REGULATORY FUNCTIONS

■ 1. The authority citation for part 51 continues to read as follows:

Authority: Atomic Energy Act sec. 161, 1701 (42 U.S.C. 2201, 2297f); Energy Reorganization Act secs. 201, 202, 211 (42 U.S.C. 5841, 5842, 5851); Government Paperwork Elimination Act sec. 1704 (44 U.S.C. 3504 note). Subpart A also issued under National Environmental Policy Act secs. 102, 104, 105 (42 U.S.C. 4332, 4334, 4335); Pub. L. 95–604, Title II, 92 Stat. 3033–3041; Atomic Energy Act sec. 193 (42 U.S.C. 2243). Sections 51.20, 51.30, 51.60, 51.80. and 51.97 also issued under Nuclear Waste Policy Act secs. 135, 141, 148 (42 U.S.C. 10155, 10161, 10168). Section 51.22 also issued under Atomic Energy Act sec. 274 (42 U.S.C. 2021) and under Nuclear Waste Policy Act sec. 121 (42 U.S.C. 10141). Sections 51.43, 51.67, and 51.109 also issued under Nuclear Waste Policy Act sec. 114(f) (42 U.S.C. 10134(f)).

■ 2. In § 51.23, revise the section heading and paragraphs (a) and (b) to read as follows:

§ 51.23 Environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor.

(a) The Commission has developed a generic environmental impact statement (NUREG–2157) analyzing the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor. The Commission has concluded the following:

(1) The analysis in NUREG–2157 generically addresses the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor; and

(2) The analysis in NUREG–2157 supports the Commission's determinations that it is feasible to:

(i) Safely store spent nuclear fuel following the licensed life for operation of a reactor and

(ii) have a mined geologic repository within 60 years following the licensed life for operation of a reactor.

(b) As provided in §§ 51.30(b), 51.53, 51.61, 51.80(b), 51.95, and 51.97(a), and within the scope of the generic determinations in paragraph (a) of this section, no discussion of environmental impacts of spent nuclear fuel storage in reactor facility storage pool or an independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or ISFSI license, renewal, or amendment for which application is made, is required in any environmental report, environmental impact statement, environmental assessment, or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor under parts 50 and 54 of this chapter, or issuance or amendment of a combined license for a nuclear power reactor under parts 52 and 54 of this chapter, or the issuance of a license for storage of spent nuclear fuel at an ISFSI, or any amendment thereto.

* * * * *

■ 3. Section 51.61 is revised to read as follows:

§ 51.61 Environmental report—independent spent fuel storage installation (ISFSI) or monitored retrievable storage installation (MRS) license.

Each applicant for issuance of a license for storage of spent fuel in an independent spent fuel storage installation (ISFSI) or for the storage of spent fuel and high-level radioactive waste in a monitored retrievable storage installation (MRS) pursuant to part 72 of this chapter shall submit with its application to: ATTN: Document Control Desk, Director, Office of Nuclear Material Safety and Safeguards, a separate document entitled, ''Applicant's Environmental Report—ISFSI License;'' or ''Applicant's Environmental Report—MRS License,'' as appropriate. If the applicant is the U.S. Department of Energy, the environmental report may be in the form of either an environmental impact statement or an environmental assessment, as appropriate. The environmental report shall contain the information specified in § 51.45 and shall address the siting evaluation factors contained in subpart E of part 72 of this chapter. Unless otherwise required by the Commission, in accordance with the generic determination in § 51.23(a) and the provisions in § 51.23(b), no discussion of the environmental impact of the storage of spent fuel at an ISFSI beyond the term of the license or amendment applied for is required in an

environmental report submitted by an applicant for an initial license for storage of spent fuel in an ISFSI, or any amendment or renewal thereto.

■ 4. In § 51.80, paragraph (b)(1) is revised to read as follows:

§ 51.80 Draft environmental impact statement—materials license.

* * * * *

(b)(1) *Independent spent fuel storage installation (ISFSI).* Unless otherwise determined by the Commission and in accordance with the generic determination in § 51.23(a) and the provisions of § 51.23(b), a draft environmental impact statement on the issuance of an initial license for storage of spent fuel at an ISFSI or any amendment thereto, will address environmental impacts of spent fuel only for the term of the license, amendment, or renewal applied for.

* * * * *

■ 5. In § 51.97, paragraph (a) is revised to read as follows:

§ 51.97 Final environmental impact statement—materials license.

(a) *Independent spent fuel storage installation* (*ISFSI*). Unless otherwise determined by the Commission, and in accordance with the generic determination in § 51.23(a) and the provisions of § 51.23(b), a final environmental impact statement on the issuance of an initial license for the storage of spent fuel at an ISFSI or any amendment or renewal thereto, will address environmental impacts of spent fuel storage only for the term of the license or amendment applied for.

* * * * *

■ 6. In appendix B to subpart A of part 51, footnote 7 is being removed from the table and the entries for ''Onsite storage of spent nuclear fuel'' and ''Offsite radiological impacts of spent nuclear fuel and high-level waste disposal'' under the ''Waste Management'' section of Table B–1 are revised to read as follows:

Appendix B to Subpart A of Part 51—Environmental Effect of Renewing the Operating License of a Nuclear Power Plant

* * * * *

TABLE B–1—SUMMARY OF FINDINGS ON NEPA ISSUES FOR LICENSE RENEWAL OF NUCLEAR POWER PLANTS [1]

Issue	Category [2]	Finding [3]
*	*	* * * * *
Waste Management		
*	*	* * * * *
Onsite storage of spent nuclear fuel.	1	SMALL. The expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated onsite with small environmental effects through dry or pool storage at all plants, if a permanent repository or monitored retrievable storage is not available.
Offsite radiological impacts of spent nuclear fuel and high-level waste disposal.	1	For the high-level waste and spent-fuel disposal component of the fuel cycle, the EPA established a dose limit of 15 millirem (0.15 mSv) per year for the first 10,000 years and 100 millirem (1.0 mSv) per year between 10,000 years and 1 million years for offsite releases of radionuclides at the proposed repository at Yucca Mountain, Nevada. The Commission concludes that the impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and high level waste disposal, this issue is considered Category 1.
*	*	* * * * *

[1] Data supporting this table are contained in NUREG–1437, Revision 1, ''Generic Environmental Impact Statement for License Renewal of Nuclear Plants'' (June 2013).

[2] The numerical entries in this column are based on the following category definitions:

Category 1: For the issue, the analysis reported in the Generic Environmental Impact Statement has shown:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic;

(2) A single significance level (i.e., small, moderate, or large) has been assigned to the impacts (except for Offsite radiological impacts—collective impacts from other than the disposal of spent fuel and high-level waste l); and

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation.

The generic analysis of the issue may be adopted in each plant-specific review.

Category 2: For the issue, the analysis reported in the Generic Environmental Impact Statement has shown that one or more of the criteria of Category 1 cannot be met, and therefore additional plant-specific review is required.

[3] The impact findings in this column are based on the definitions of three significance levels. Unless the significance level is identified as beneficial, the impact is adverse, or in the case of ''small,'' may be negligible. The definitions of significance follow:

SMALL—For the issue, environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission's regulations are considered small as the term is used in this table.

MODERATE—For the issue, environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE—For the issue, environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For issues where probability is a key consideration (i.e., accident consequences), probability was a factor in determining significance.

Dated at Rockville, Maryland, this 30th day of August, 2013.

For the Nuclear Regulatory Commission.

Kenneth R. Hart,

Acting Secretary of the Commission.

[FR Doc. 2013–21708 Filed 9–12–13; 8:45 am]

BILLING CODE 7590–01–P