

POLICY ISSUE INFORMATION

February 28, 2011

SECY-11-0029

FOR: The Commissioners

FROM: Catherine Haney, Director
Office of Nuclear Material Safety
and Safeguards

SUBJECT: PLAN FOR THE LONG-TERM UPDATE TO THE WASTE
CONFIDENCE RULE AND INTEGRATION WITH THE EXTENDED
STORAGE AND TRANSPORTATION INITIATIVE

PURPOSE:

The purpose of this paper is to (1) provide the plan to develop a long-term waste confidence (WC) rule, including an environmental impact statement (EIS) and updated WC decision, for the handling and extended storage of spent nuclear fuel (SNF) for more than 60 years after a reactor's licensed life, and (2) describe the integration of WC activities with the extended storage and transportation (EST) project plan activities. This paper responds to staff requirements memorandum (SRM-) SECY-09-0090, "Final Update of the Commission's Waste Confidence Decision," dated September 15, 2010, and SRM-COMSECY-10-0007, "Project Plan for Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel," dated December 6, 2010.

SUMMARY:

In 2010, the Commission issued an updated WC rule and decision, and separately directed the staff to develop a longer term WC update to consider the storage of SNF and high-level waste (HLW) for more than 60 years after the licensed life for operation of any commercial power reactor. The WC update will consist of an EIS, a WC Decision (which includes updated safety findings), and the 10 CFR Part 51 rule update. The EIS will provide the basis for the generic environmental determination made in the updated rule. Much of the work to develop the supporting technical bases and environmental impact analyses will be similar to the work described in COMSECY 10-0007, dated June 15, 2010 (ADAMS No. ML101390216).

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SECY NOTE: THIS SECY PAPER (WITH THE EXCEPTION OF ENCLOSURE 3) WILL BE RELEASED TO THE PUBLIC IN 10 WORKING DAYS.

The staff will integrate activities into an EST Regulatory Program with two main goals: (1) update the WC decision and rule and (2) enhance the technical and regulatory basis of the existing regulatory framework for the regulation of SNF for extended periods. The staff will engage stakeholders through public meetings and workshops, as well as the National Environmental Policy Act (NEPA) scoping process, EIS development, and the Administrative Procedure Act notice-and-comment rulemaking processes.

The staff considers a timeframe of up to 300 years of storage to be appropriate for characterization and prediction of aging effects and aging management issues for EST. The staff may adjust this analytical period based on the expanded gap assessment results, expected in 2012, which will identify technical and regulatory needs to support the development of an EST framework and WC update.

The staff plans to complete a WC update in fiscal year (FY) 2016. The schedule depends, in part, on the results of technical analyses that the U.S. Nuclear Regulatory Commission (NRC) develops and applicable data collected during the same time by external organizations such as the U.S. Department of Energy (DOE). The Agency's proposed resources for this activity will need to be significantly augmented in FY 2012 and FY 2013 to conduct research and necessary analyses to support this schedule. In lieu of providing annual information papers to the Commission as directed by SRM-COMSECY-10-0007, the staff will inform the Commission of significant progress and any significant changes in plans, as appropriate.

BACKGROUND:

On June 15, 2010, the staff provided its detailed project plan in COMSECY-10-0007, which identified research needs and potential enhancements to the EST regulatory basis over a projected 7-year timeframe. The project plan would also make other near-term improvements to the storage and transportation regulatory framework.

The Commission issued SRM-SECY-09-0090 on September 15, 2010, which directed the staff to update Title 10 of the *Code of Federal Regulations* (10 CFR) 51.23, "Temporary Storage of Spent Fuel after Cessation of Reactor Operation—Generic Determination of No Significant Environmental Impact," and revise Findings 2 and 4 of the WC decision. On December 23, 2010, the NRC published the updated rule and decision in the *Federal Register* (75 FR 81032 and 81037). The SRM directed the staff to develop a plan for a long-term rulemaking effort to go beyond the updated WC rule to account for storage at onsite facilities, offsite facilities, or both, and address the impacts of storage beyond a 120-year timeframe. The SRM also directed the staff to recommend an appropriate timeframe for the technical analysis beyond 120 years and to prepare an EIS to serve as the environmental analysis to support this rulemaking effort. The SRM stated that the plans and resources for this longer-term rulemaking should be integrated and realigned, to the extent possible, with the staff's current efforts to examine EST of SNF in accordance with COMSECY-10-0007.

On December 6, 2010, the Commission issued SRM-COMSECY-10-0007, which approved the EST project plan in part and provided additional direction to the staff. Specifically, the Commission directed the staff to integrate WC update and EST activities, to reflect the resources available in the FY 2012 budget, to include a prioritization of the main elements of

the EST project plan, to provide general resource estimates for the years beyond FY 2012, and to discuss the impacts of the WC activities on EST activities (e.g., EST activities that may be deferred).

DISCUSSION:

Based on Commission direction, the staff is integrating the current EST project plan activities and long-term WC update activities into an EST Regulatory Program with two main goals: (1) update the WC decision and rule to ensure the continued long-term stability of the generic safety and environmental findings in the rule by developing a NEPA analysis (in this case an EIS) that continues to be informed by current circumstances and scientific knowledge, and (2) enhance the technical and regulatory basis of the existing regulatory framework (i.e., 10 CFR Parts 71, 72, and 73) to identify and resolve technical, environmental, and regulatory issues associated with regulation of SNF for extended periods. While the two goals share common elements, they have different timing, scope, depth, and analysis of some key research activities.

Enhancement of the EST regulatory framework is focused on ensuring that the NRC is able to regulate extended storage facilities and extended aging management programs, if necessary. The research and analyses will address important aging phenomena and aging management issues (including maintenance, monitoring, and mitigation) associated with the regulatory oversight of EST operations. For the WC update, the research and analyses will highlight the impacts of aging effects and aging management needs on the affected environment (e.g., human health, natural resources, socio-economic, etc.), and will examine important environmental characteristics for longer periods of time. The EST Regulatory Program will supersede the current EST project plan and is under development. It will integrate the scope and timing of activities to efficiently and effectively support both goals to the extent practical. Enclosure 2 describes the strategy for developing the technical basis for WC and integrating ongoing EST project plan activities with WC update activities.

In 2010, the staff began an assessment, referred to as a gap assessment, to identify technical and regulatory needs to expand the basis for regulating EST. The staff plans to issue the draft gap assessment in November 2011 for comment and finalize it in April 2012. The staff has already identified three key areas that will need to be assessed and is adjusting ongoing research plans to address these areas. These areas include long-term canister shell and weld integrity, metallic seal and lid bolt integrity, and concrete overpack integrity in various external environmental conditions. These key areas provide fundamental confinement of SNF and protection against normal environmental conditions and accident events. Understanding the integrity of SNF cladding for extended periods of wet and dry storage and long-term cask monitoring capabilities are also high priority areas. One significant outcome of the various research studies may be the identification of failure modes and storage times that require significant mitigation (e.g., replacement of major cask components or fuel repackaging) to ensure continued safe storage and transportability. However, the staff has not yet identified the need for significant mitigation.

By April 2012, the staff will identify any additional needs to specifically develop the WC EIS (e.g., future HLW waste forms and storage effects on the surrounding environment). DOE Office

of Nuclear Energy is concurrently identifying and prioritizing technical gaps for the EST of SNF. Separately, the Blue Ribbon Commission on America's Nuclear Future (BRC) intends to issue draft and final recommendations on national spent fuel management issues in July 2011 and January 2012, respectively. To the extent practical, the staff will consider the results of those assessments and BRC recommendations.

The staff will continue to define and integrate its research activities, perform environmental scoping assessments, prioritize research, and begin the formal NEPA scoping process in April 2012 to support the WC rule. Upon publication of the final WC rule in FY 2016, the staff may need to continue research activities and complete any appropriate EST regulatory framework rulemakings for an additional two years.

Plan for Developing the Waste Confidence Update and EST Activities

Enclosure 1 describes the plan for completing the WC update by FY 2016, including the preliminary scope of the EIS. The plan for developing the WC update consists of three key activities: (1) developing the technical information needed to understand the significant safety issues and environmental impacts of EST, (2) developing an EIS and updated WC decision for long-term storage and handling of SNF, and (3) revising the WC rule, as appropriate. Because the WC rule is a generic environmental determination, the regulatory basis for the rule (the EIS, WC decision, and relevant EST technical analyses) will take the most time and resources to complete. Once the basis is in place, the rulemaking process itself will rely on the EIS (with appended WC decision) to provide the regulatory basis for the WC rule.

The following table shows the schedule for major activities leading to the WC update and EST rulemaking, if needed.

Schedule of Major Activities

Activity	Start	Complete
Expanded EST & WC Gap Assessment	Ongoing	April 2012
Supporting Research and Analyses (WC & EST)	Ongoing	2015
Scoping and draft EIS Development	April 2012	2014
Final EIS and WC Rule	2014	2016
Additional EST Framework Research	2014	2015
EST Regulatory Basis and Guidance	2014	2016
EST Rulemaking (if needed)	2016	2018

Preliminary Scope of the Environmental Impact Statement and Long-Term Update of the Waste Confidence Rule

The EIS will provide the regulatory basis for the update to the WC rule. The staff will comply with the NRC regulations for implementing NEPA in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and will follow NRC NEPA guidance, as appropriate. The staff considers periods of up to 300 years to be appropriate for the technical analyses of cask system performance considering the current knowledge of potential aging phenomena and the cumulative increase of uncertainties over long

timeframes. The EIS will initially consider the impacts of SNF and HLW handling, storage, and associated transportation from approximately the years 2050 to 2250. This timeframe is based on the greater uncertainties that accompany environmental characteristics and environmental impacts for longer periods and considerations for the 300 years of cask aging analyzed in the technical analysis for EST. The staff selected 2050 as the starting point for the NEPA analysis to approximate the minimum storage periods contemplated in the current Waste Confidence rule (“at least” 60 years after the expiration of licensed life) and an end-date of 2250 to approximate the time when this fuel could approach 300 years of total storage time (in a combination of wet and dry storage). The timeframe could be shortened if uncertainties are greater than expected. Alternatively, the timeframe could be expanded if the uncertainties of impacts for longer periods are not significant. The staff will be conducting pre-EIS scoping assessments of the 2050–2250 timeframe and intends to solicit stakeholder feedback on this timeframe.

The staff is also considering the use of segmented periods of time for the environmental analysis (e.g., 2050–2150 and 2150–2250). The analyses may show that some environmental impacts can be more easily characterized or graded by different time periods. When updating the rule, the staff will correlate the EIS analyses of impacts to generic safety and environmental findings for some period of storage after reactor licensed life (e.g., 100 or 200 years after reactor licensed life instead of the current 60 years). The EIS will consider the range of impacts typically included in NRC environmental analyses, as appropriate. These may include impacts on human health, natural and cultural resources, land use, socioeconomic conditions, and an analysis of cumulative impacts. The Appendix to Enclosure 1 describes the preliminary scenarios and initial scoping assumptions that will be considered in development of the EIS.

Near-Term Regulatory Improvements

The staff is implementing near-term licensing, inspection, and enforcement program improvements as described in COMSECY-10-0007. These activities include a comprehensive review of the current regulations, guidance, and standards to identify and implement near-term efficiency and effectiveness enhancements within the current regulatory technical bases. The ongoing reviews, which are budgeted separately from EST and WC, will address current challenges with dual-purpose cask certification and will enhance the effectiveness of the licensing, inspection and enforcement programs in an integrated manner. As directed in SRM-COMSECY-10-0007, the staff will develop performance measures to track efficiency and effectiveness gains from near-term improvements. Progress on these regulatory activities is not integral to addressing the technical and environmental challenges of the WC update and enhancing the EST regulatory framework. As a result, the staff will implement and track separately from the new EST Regulatory Program the licensing, inspection, and enforcement regulatory program improvements defined in the EST project plan.

Stakeholder Interaction

The staff has engaged some stakeholders through industry meetings, workshops, public meetings, and conferences related to EST and will continue to engage various stakeholder groups, such as the public, State, local, and tribal governments, industry, and international

counterparts. For example, the staff has interacted on EST issues at the Nuclear Energy Institute dry cask storage forum, NRC Storage and Transportation Licensing Workshop, Electric Power Research Institute Extended Storage Collaboration Program meetings, DOE used nuclear fuel program technical meetings, Council of State Governments and National Conference of State Legislators meetings, and several national and international conferences. The staff has also participated with stakeholders in BRC meetings to provide regulatory perspectives on the safety and security of storage and transportation. The staff has used the information from these meetings to identify regulatory and technical issues and high-priority research activities for the EST project plan. Enclosure 2 provides additional description of EST activities of external stakeholders and NRC coordination efforts.

The staff will continue to interact with stakeholders and share information to develop the technical basis for the WC update and EST regulatory framework. The staff plans to hold a public workshop in the summer of 2011 to solicit input on technical and regulatory issues. The staff will publish for public comment its draft gap assessment results and the preliminary scope of the EIS. The staff will hold public meetings as part of the NEPA public scoping process and after the draft EIS is published. As the WC update progresses, the staff will seek more opportunities to engage stakeholders.

Future Adjustments to Plan for WC Update and EST Regulatory Program

As the staff develops its scoping assessments over the coming year, it will consider the data and analyses that the NRC can either develop itself or leverage from external organizations within the schedule established for the WC update. The uncertainties in aging phenomena, cask performance, and environmental impacts may increase over longer fuel aging periods, and the resulting limitations in the technical analyses will influence the final scope of the WC update. However, by April 2012, the staff will have an improved understanding of the scope of the technical analyses that should be developed, the research plans of external parties that can be effectively leveraged, and potential changes that are needed in the scope and schedule of the EIS. By this time, the staff will have received stakeholder feedback and developed insights from the final gap assessments, the BRC will have completed its final recommendations, and DOE's Office of Nuclear Energy will likely have completed its gap assessments and started developing research plans to address EST.

The staff may also need to update the EST Regulatory Program at that time and consider changes in the scope or completion times for the WC update, as appropriate. In lieu of providing annual information papers to the Commission as directed by SRM-COMSECY-10-0007, the staff would inform the Commission of any significant changes in the scope of these projects or schedules, as appropriate.

RESOURCES:

Enclosure 3 describes resource needs for a FY 2016 completion of the WC update and the potential impacts on scope and schedule if sufficient resources cannot be provided, including delayed completion dates for the WC update (e.g., 2018 and 2020).

The staff considered the feasibility of completing an update before FY 2016, should additional resources be made available. However, the minimum amount of time needed to plan and complete limited research, adequately engage stakeholders, and develop a comprehensive EIS precludes a shorter timeframe.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objection. The required funding in future years will be addressed during the Planning, Budgeting and Performance Management process at the agency level.

The staff requests that this paper, with the exception of Enclosure 3, be made publicly available to facilitate future dialogue with stakeholders on WC activities.

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Enclosures:

1. Plan for the Long-Term Update of the Waste Confidence Rule
2. Strategy for Integrating Extended Storage and Transportation Project Plan and Waste Confidence Rule Update Activities
3. Projected Resource Needs for the Extended Storage and Transportation Regulatory Program

Plan for the Long-Term Update of the Waste Confidence Rule

Overview of the Plan

Based on the direction in Staff Requirements Memorandum (SRM)-COMSECY-10-0007 and SRM-SECY-09-0090, the staff is integrating activities into an extended storage and transportation (EST) Regulatory Program with two main goals: (1) update the WC decision and rule to ensure the continued long-term stability of the generic safety and environmental findings in the rule by developing a NEPA analysis (in this case an EIS) that continues to be informed by current circumstances and scientific knowledge, and (2) enhance the technical and regulatory basis of the existing regulatory framework for the regulation of spent nuclear fuel (SNF) for extended periods. The staff will transform the current EST project plan into a high-level EST Regulatory Program with the integrated goals and activities for the WC update and EST¹. The following describes the specific plan for achieving the first goal of updating the WC rule.

The plan for the WC update consists of three key activities: (1) develop the technical information needed to understand the significant safety issues and environmental impacts of extended storage and transportation; (2) develop an environmental impact statement (EIS) and updated WC decision (generic safety findings) for 300 years of storage and handling of SNF; and (3) revise the WC rule to reflect the updated WC decision and the conclusions of the EIS as appropriate. Table 1-1 shows the general sequence of these activities for the major stages of development.

The staff will plan the technical analyses, EIS development, and WC rulemaking to be completed in FY 2016. The scope and depth of the WC update will depend on the extent and quality of the supporting technical basis, which will be developed through research and analyses. During this time, the staff will pursue the highest priority research activities over a period of two and a half years to provide a basic technical basis for the WC update. Additional research and analyses would continue beyond the two and a half year timeframe to further inform the regulatory basis for extended aging management. The staff will incorporate any changes to the SNF storage and transportation regulations in approximately FY 2018. The following discussion describes the key activities of the plan for the WC update.

Technical Analyses

The staff expects that significant effort will be needed over multiple years to develop the research, analyses, and supporting technical basis for the WC update. The existing safety record of storage facilities, existing research and analyses, and past storage demonstration projects provide a foundation for the safe and secure storage of fuel for several decades. However, the existing technical data limits staff's ability to conduct a longer-term analysis of the aging mechanisms and performance of dry cask and wet storage systems. To bolster these analyses, the staff will need to perform studies to identify the state of technical information and

¹ The "current EST project plan" refers to the staff's "Project Plan for Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel," dated June 15, 2010 (ADAMS Accession No. ML101390216). Staff is currently implementing this plan, as partially approved by the Commission in SRM-COMSECY-10-0007. The EST Regulatory Program will supersede the current EST project plan (as referenced here within) and is under development.

develop testing, methods, and analytical plans to obtain additional data. These studies could result in additional experiments (if feasible within the established schedule) or focused studies to increase the understanding and characterization of important aging phenomena, safety-significant uncertainties, monitoring capabilities and needs, and environmental impacts over longer periods of time. The staff will continue the integrated EST and WC gap assessment, which will identify any additional research and analysis needed to support the objectives of the WC update. This will include environmental scoping assessments for the different types of storage facilities and sites that the EIS may need to address (see Enclosure 2 for further information).

The staff will perform a technical analysis of a combination of wet and dry storage for up to 300 years. This time period may identify scenarios and timeframes where significant aging management actions (e.g., repackaging of SNF) may be needed to address long-term aging. The staff will also focus on increasing its understanding of extended aging issues and the implications of aging management for extended license renewal periods. This would include potential storage operations, which may significantly influence the environmental impacts in areas such as human health (e.g., worker dose and accident risk), socioeconomics (e.g., costs of aging mitigation and cask replacements), and infrastructure (e.g., construction of new facilities to unload degraded casks and repackage SNF). For example, the staff needs to obtain additional data and complete further analysis of the long-term behavior of steel and concrete overpacks in adverse environmental conditions, and the generic impacts of significant aging management practices, including the repackaging of spent fuel.

The staff will perform independent research and analyses, and will leverage and coordinate with the research performed by other entities, as appropriate. This coordination includes future research by the U.S. Department of Energy (DOE) and international entities with similar cask technologies. The extent to which information from external domestic initiatives can be leveraged will depend on the scope and timing of initiatives that DOE and industry pursue after the publication of the Blue Ribbon Commission on America's Nuclear Future (BRC) recommendations.

Environmental Impact Statement

The staff plans to develop the EIS to assess the impacts from approximately the years 2050 to 2250. This initial timeframe is consistent with a goal of assessing whether there continue to be no significant environmental impacts and ensuring the continued safety of SNF and high-level waste (HLW) storage beyond the “at least 60 years” considered in the 2010 WC rule.² This preliminary timeframe (2050-2250) considers the 300 years of aging evaluated in the technical analysis. The staff selected 2050 as the starting point for the analysis because it represents when some SNF will begin to reach the minimum storage periods contemplated in the current Waste Confidence rule (60 years after the expiration of licensed life). An end-date of 2250 was selected because that is approximately when the oldest fuel would approach 300 years of

² The current WC findings and final rule (10 CFR 51.23, “Temporary Storage of Spent Fuel after Cessation of Reactor Operation—Generic Determination of No Significant Environmental Impact) were published on December 23, 2010. (See *Federal Register*, Volume 75, pages 81032-81076.) Finding 4 states that the Commission finds reasonable assurance that SNF 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. The NRC has identified Dresden 1, licensed in 1959, as the earliest licensed power reactor: for Dresden 1, 60 years beyond the licensed life for operation is 2059.

storage. The scope also addresses the potential cumulative environmental impacts of the handling and storage of SNF and HLW for 300 years.

The WC update will consider the extended management of SNF fuel that is currently stored at reactor pools and in dry cask storage, as well as future types of SNF. The EIS will use the environmental impact analyses and safety findings developed for the 2010 WC rule as the foundation for characterizing the affected environment in 2050. As with the current WC rule and decision, the WC EIS will generically analyze potential impacts. However, it will not be a substitute for specific EISs or environmental assessments required for site-specific licensing actions (e.g., approval of new storage facilities) or major rule changes (e.g., enhancement of regulations). The long analytical timeframe for the WC update will require that some impacts be assessed in a more qualitative manner for the extended periods. The Appendix to this enclosure describes the preliminary EIS scenarios and major scoping assumptions that may be considered in the EIS.

The EIS analyses may be conducted using a framework of discrete periods of time (e.g., 2050–2150, 2150–2250). The analyses may show that some environmental impacts can be more easily characterized or graded according to different time periods. It may also facilitate the binning of time-dependent uncertainties in the technical and environmental impact analyses that may change in magnitude over time. For example, this analytical approach may allow significant changes in impacts from aging-related issues (e.g., need for fuel repackaging) to be distinguished between major time periods. In addition, this approach may allow the staff to consider the potential application of any reprocessing and alternative disposal capabilities that may become available in the future. The staff intends to define the specific time periods within the segmented approach after performing internal scoping assessments, considering insights from short-term research on aging effects, and considering initial stakeholder input.

The staff will develop the EIS in accordance with the U.S. Nuclear Regulatory Commission's (NRC's) requirements in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and NRC National Environmental Policy Act (NEPA) guidance documents, as appropriate. The schedule and scope of the EIS will depend to some extent on the progress and results of the supporting technical analyses of long-term aging phenomena. The variety of cask technologies, storage scenarios (time and location), SNF handling activities, representative site characteristics, and long-term aging phenomena, add complexity to the required scope of the technical analyses and structure of the EIS. The environmental analyses and generic safety findings will require a well-justified consideration and identification of patterns, trends, storage characteristics, and aging impacts to develop conclusions about the potential environmental impacts of extended storage. In addition, the breadth of the EST regulatory and WC update activities may generate widespread interest among stakeholders. The staff will establish a communication strategy to ensure stakeholder participation in enhancing the EST regulatory framework and developing the WC update.

Waste Confidence Decision and Rule

The staff will develop a proposed WC rule as it finishes preparing the draft EIS. As directed in SRM-SECY-09-0090, the staff will send the proposed rule and draft EIS to the Commission as a Notation Vote Paper. If the Commission approves publication of the proposed rule and draft EIS, the staff will publish the draft EIS, proposed update to the WC decision, and proposed rule for stakeholder comment (the updated WC decision will be an appendix to the EIS). After the conclusion of the public comment period, the staff will develop and publish the final EIS, final

WC decision, and final rule. The staff will also consider changes to the WC decision's current "five findings" structure as part of the draft EIS and proposed rule.

If the Commission decides to go forward with this effort and promulgates a final WC rule, the rule would be in place well before 2059, when spent nuclear fuel from the first licensed power reactor (Dresden 1) will have been stored for 60 years beyond that reactor's licensed life for operation.

Adjustments to the Plan and Scope of the Waste Confidence Update

The scope and timing of the WC update is influenced by the extent and quality of the supporting information that can be developed for aging effects on dry cask storage systems and associated aging management issues (e.g., monitoring needs); the time needed to develop the EIS in accordance with NEPA and NRC requirements; and consideration of stakeholder input in the update. This estimated effort and time will also evolve as a result of the gap assessments, the progress of NRC research, and the external research that can be leveraged, with available resources.

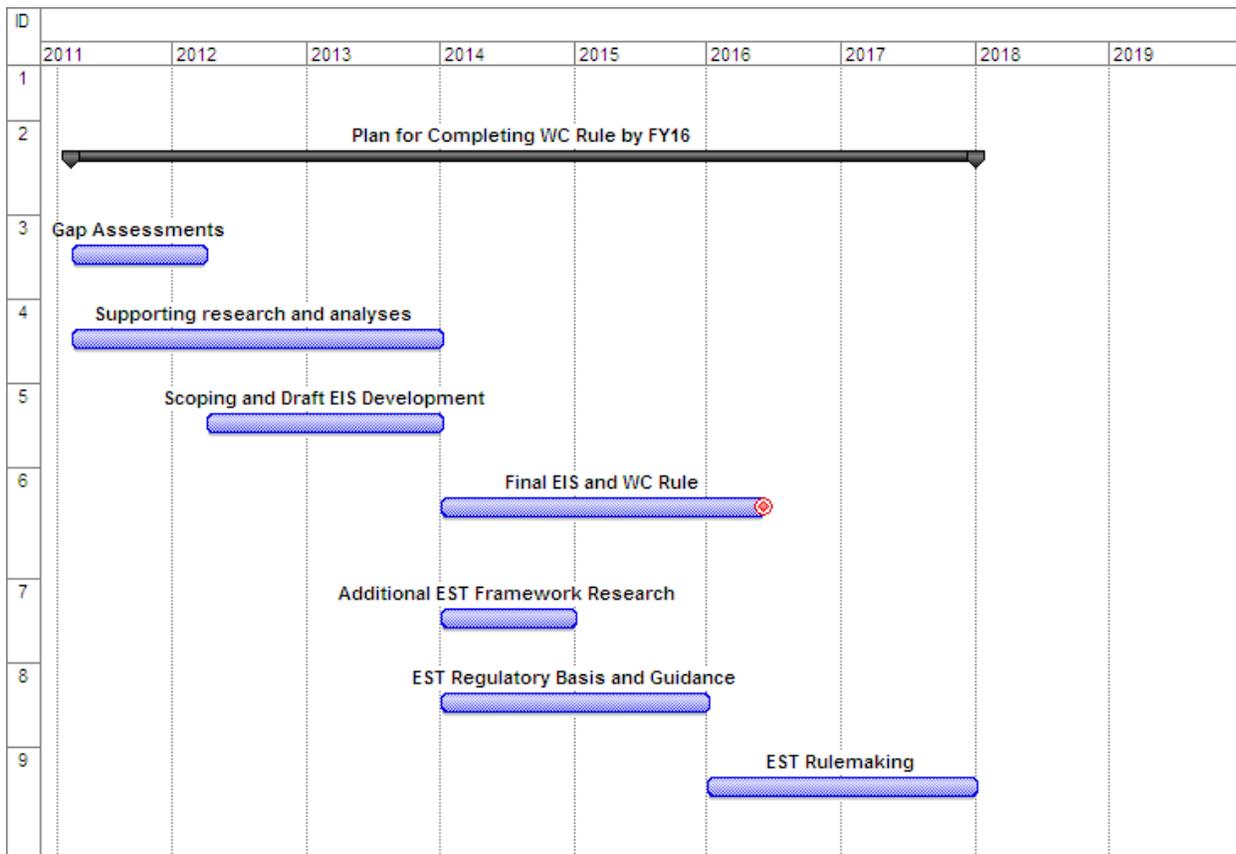
In cases where sufficient technical information is not available to meet the FY 2016 schedule, the staff will make bounding assumptions in the EIS or reduce the scope of the overall assessments (e.g., scenarios and timeframes). In addition, the staff would consider potential environmental impact findings that are based more on the future capabilities to monitor and mitigate cask degradation (if supported by associated research), instead of obtaining data to understand long-term aging effects on cask components. As a result, the staff will iteratively adjust the basis, scope, and conservatism of the WC update to mitigate any lack of data or uncertainties.

By April 2012, the staff will have an improved understanding of the scope of technical analyses that should be developed, the research plans of external parties that can be effectively leveraged, and potential changes that are needed in the scope and timing of the EIS. By this time, the staff will have received stakeholder feedback and developed insights from the final gap assessments. The BRC will have completed its final recommendations, and DOE's Office of Nuclear Energy will likely have progressed in developing research plans to address EST (see Enclosure 2 for additional information). The staff may need to update the EST Regulatory Program at that time and make changes in the scope or completion times for the WC update, as appropriate.

**Table 1-1
Key Activities of the WC Update**

Key Activities		
Technical Analysis	EIS	Rule
Internal scoping activities to determine what preliminary analyses need to be conducted		
Conduct short-term preliminary technical analyses to assist in defining EIS scope; includes targeted stakeholder interaction	----	
Long-term research and analyses activities	Conduct NEPA scoping process (after initial stakeholder interactions); refine EIS scenarios and assumptions.	
Develop technical analysis and WC decision		
Publish proposed rule and draft EIS for comment (<i>with technical analyses and WC decision as an appendix</i>)		Develop proposed rule language and statements of consideration (SOCs)
Public Comment Period and Resolution of Comments		
Update technical analyses (as appropriate)	Develop final EIS	Develop final rule language and SOC's
Publish final rule and final EIS (with WC decision)		

Figure 1- 1 Major Activities of WC Update



Appendix—Preliminary Scope of EIS

The staff has identified preliminary scenarios for analysis and preliminary scoping assumptions to define the scope of the waste confidence (WC) environmental impact statement (EIS). These scenarios and assumptions significantly influence the scope of research, environmental impact analyses, resources, and overall time needed to complete the EIS and develop the WC decision (generic safety findings). The staff is currently performing internal scoping reviews, including environmental gap assessments and sensitivity analyses, to better understand the impact of these scenarios and initial scoping assumptions. Early results from these scoping analyses and stakeholder feedback will assist the staff in identifying the magnitude or nature of the impacts that need to be assessed in the EIS. After refining the scenarios and scoping assumptions the staff will publish a Federal Register Notice announcing its intent to develop an EIS and initiate the formal public scoping process consistent with the National Environmental Policy Act (NEPA).

Preliminary Scenarios

Based in part on the direction in Staff Requirements Memorandum (SRM)-SECY-09-0090, “Final Update of the Commission’s Waste Confidence Decision,” dated September 15, 2010, the staff has identified four preliminary scenarios for the draft EIS. The EIS will focus on analyzing the environmental impacts associated with the storage and handling of spent nuclear fuel (SNF) and high-level waste (HLW) within each scenario. The generic safety issues associated with the storage of SNF and HLW will be included in the updated WC decision, which will be an appendix to the EIS. Each scenario assumes that SNF and HLW will ultimately be transported to a geologic repository for disposal (and that at least one repository will need to be constructed). To the extent practical, the EIS will not include detailed quantification and analyses of environmental impacts that are not directly related to the handling, storage, and transportation of SNF (e.g., detailed site-specific construction impacts). The detailed assessment of impacts associated with facility construction, operation, and decommissioning would be addressed in a facility-specific licensing action and associated NEPA analysis (EIS or environmental assessment).

The scenarios evaluated in the WC EIS will consider the potential application of advanced SNF management technologies and alternative approaches to disposal, such as deep borehole disposal (as directed in SRM-SECY-09-0090). To the extent practical, the analyses will draw on existing research and analyses (including international experience) related to reprocessing and alternate disposal technologies. However, additional analyses of alternate disposal, reprocessing, and advanced fuel management concepts may be necessary to fully inform the EIS; these additional analyses might require additional NRC studies.

Scenario 1—Extended onsite storage at reactor sites and independent spent fuel storage installations (ISFSIs)

This scenario assumes that SNF is stored for extended periods at operating reactor sites and away-from-reactor independent SNF storage installations (approximately 50–100 sites) for up to 300 years. The dry cask storage facilities at some reactor sites will continue to operate in-place after reactor facilities are decommissioned and until the SNF is transported to a disposal site.

Scenario 2—Interim onsite storage and shipment to regional storage facilities

This scenario assumes that SNF is stored at current storage facilities for an interim period, and then a significant population of SNF is transported to one or more regional dry cask storage facilities for extended storage. These regional facilities would have the capacity to store SNF from the surrounding region until it is transported for disposal.

Scenario 3—Interim onsite storage and shipment to large centralized storage facility

This scenario assumes that SNF is stored at current storage facilities for an interim period, and then a significant population of SNF is transported to one very large, centralized dry storage facility or a monitored retrievable storage facility operated by the U.S. Department of Energy (DOE). The SNF would be stored at this facility until it is transported to a disposal facility. The impacts from this scenario may be similar to the impacts of regionalized storage under Scenario 2. During scoping, the staff will determine if these options can be evaluated together as a single scenario, with scaling of Scenario 2 impacts to represent a larger centralized storage facility.

Scenario 4—Interim onsite storage and shipment to at least one reprocessing facility

This scenario assumes that SNF is stored for an interim period using one or more of three methods described for Scenarios 1, 2 and 3, and then a significant amount of SNF is transported to one or more reprocessing facilities for the recovery of fissionable material for fuel and removal of short-lived species for waste reduction. As a result of reprocessing, new forms of HLW and low-level waste (LLW) would be generated and stored at the reprocessing facility. These wastes would eventually be transported to a national HLW repository or LLW disposal facilities, as appropriate.

Preliminary Scoping Assumptions

The staff has identified preliminary scoping assumptions to further define and constrain the scope of the environmental impact analyses within each scenario, as appropriate. Some assumptions have uncertainties that could increase over the longer periods of time that would be analyzed in the EIS. In general, the EIS would minimize speculation about future conditions when identifying the long-term characteristics of the affected environment and the back end of the fuel cycle. These initial scoping assumptions generally assume that present-day attributes, current scientific knowledge, and established trends for potential growth in the use of nuclear power and SNF generation rates are applicable for SNF management scenarios during extended periods. For example, the EIS would not speculate in detail about advanced reprocessing or transmutation technologies, but would use available information on current technologies and on reasonably foreseeable technologies that are being explored in depth. However, some projection may be needed to fully develop the EIS.

- (1) The affected environment and baseline environmental conditions will be defined within the scope of the current WC rule and decision.

The NRC has confidence that SNF can be stored safely and securely for at least 60 years beyond the licensed life of operation for a given reactor (75 FR 81032). This period represents a timeframe from the present day to approximately 2059 (see footnote 1 in this enclosure). To adequately describe the “affected environment,” which is required for an EIS under NEPA and NRC regulations, the staff will need to characterize conditions at the starting point for the impact analyses (i.e., 60 years beyond licensed reactor operations). The staff will use information supporting the present WC rule to develop baseline criteria for describing the affected environment in the EIS.

- (2) There is no loss of either passive or active institutional controls.

During the period of extended storage of SNF, the staff assumes that responsible entities (e.g., reactor licensees or the Federal Government) will provide oversight for the safe and secure operation and maintenance of a licensed storage facility, using security, monitoring, inspection, aging management (maintenance and repair), and enforcement programs that are at least as stringent as the current regulatory requirements. The responsible entities would provide the necessary financial resources for operating, securing, and maintaining storage facilities for extended periods of time (regardless of cost). The NRC and other Federal Government agencies would provide regulatory oversight of these operations during extended periods.

- (3) Long-term storage and handling facilities will operate under an extended aging management framework designed to monitor, detect, and mitigate significant aging impacts.

A general regulatory framework exists to accommodate multiple storage license renewals with an aging management plan for SNF. The framework consists of time-limited aging analyses and a program to monitor, detect, and mitigate the effects of aging. As part of the environmental scoping analyses, the staff will consider the potential for future licensees to perform significant mitigation actions to address long-term aging effects. These actions could include significant component refurbishment or repackaging of the fuel in large cask populations into new systems, which could influence environmental impacts over longer time periods.

- (4) Long-term transportation will rely on existing package technologies and operate under current transportation infrastructures and regulatory requirements.

Many SNF transportation systems are designed to be dual-purpose in that they meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 71, “Packaging and Transportation of Radioactive Material,” for future transportation and also serve as storage casks for storage under 10 CFR Part 72, “Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste.” However, a variety of single-purpose and dual-purpose cask designs and variations in SNF characteristics (e.g., high-burnup fuel) exist, which may limit future transportability. As a result, the EIS will consider the impacts of repackaging operations or other actions to ensure transportability after extended storage. To develop the transportation impacts analyses, the staff will assume that present-day infrastructure and transportation modes are in place in the future and will use, where appropriate, relevant aspects of existing transportation

impact analyses in other recent NRC and DOE NEPA documents. The staff will not speculate about changes in the national transportation infrastructure (roads, railways, etc.) or transportation modes that may occur decades or centuries from now.

- (5) Current light-water reactor (LWR) SNF will generally serve as the baseline SNF to be considered in long-term scenarios. The EIS may address the potential influence of advanced fuel types and LWR cladding.

Consistent with the basis of the current WC rule (75 FR 81037), the staff assumes that the impacts associated with current LWR fuel management adequately represent the impacts of management of future fuel types under the current generic safety findings. As a baseline, the EIS will consider current LWR fuel and potential reprocessing methods in long-term storage scenarios and will assume that future fuel types and management processes are analogous to current fuel management processes. In addition, the staff will assume that the burnup of the fuel may increase above current limits as reactor technology progresses.

- (6) A moderate increase in the use of nuclear power will be assumed in projecting long-term SNF generation rates.

The continued use and potential growth of nuclear power is expected to increase the amount of waste in storage, thus affecting the environmental impacts (e.g., the need for larger storage capabilities and aging management impacts). For the purposes of assessing the cumulative impacts, the staff will assume “medium” growth of nuclear power as projected by DOE, in which nuclear power continues to supply approximately 20 percent of U.S. electricity production (see ADAMS Accession No. ML110180652).

- (7) Dry cask storage technologies will be the industry’s preferred alternative over spent fuel pools for additional long-term storage capacity.

For economic reasons, the staff expects industry to use dry cask storage for large-scale, extended storage needs beyond the licensed life of the reactor. Spent fuel pools will continue to play an integral role in interim storage and handling of SNF at reactors during renewed license terms and decommissioning operations. Operational pools are used to temporarily store SNF and are needed to allow sufficient radioactive decay before loading of the SNF into dry storage casks and transportation packages. Spent fuel pools may be in operation for many decades in potential extended reactor operations. Therefore, the staff assumes that reactor pools will be part of the continued infrastructure for managing SNF, but primarily only for pre-ISFSI storage and handling uses. This does not discount the possibility that unique spent fuel pool facilities, such as GE Morris, may be used on a smaller scale or that some utilities may make business decisions to keep spent fuel pools operational for long periods after cessation of reactor operations.

- (8) Consistent with current regulatory requirements, confinement barriers must protect spent fuel against significant degradation during extended storage to maintain retrievability and prevent operational safety problems during removal from storage. Potential uncertainty regarding the properties of fuel cladding could require new storage and transportation alternatives for the safe management of a large amount of high-burnup fuel during extended periods.

As discussed in more detail in Appendix A to the current EST project plan, cask systems are designed to maintain cladding integrity during interim dry storage to ensure that the primary fission product barrier is maintained through the back end of the fuel cycle. The staff believes that cladding integrity should be preserved to the extent practical. However, the staff recognizes that the uncertainty associated with maintaining cladding integrity for extended periods (within spent fuel pools, dry cask storage, and subsequent transportation) may require the consideration of new mitigating solutions to safely manage a large population of high-burnup fuel. As discussed in the current EST project plan, the staff is examining this issue and will identify any policy issues for the Commission's consideration, as appropriate.

- (9) The WC EIS will consider terrorism and sabotage (including associated security measures).

In 2007, the U.S. Court of Appeals for the Ninth Circuit held that NEPA requires an examination of the environmental impacts that would result from an act of terrorism against an ISFSI (*San Luis Obispo Mothers for Peace v. NRC*, 449 F. 3d 1016 (2006), *cert. denied*, 127 S.Ct. 1124 (2007)). However, outside of the Ninth Circuit, the Commission has adhered to its traditional position that the environmental effects of a terrorist attack do not need to be considered in its NEPA analyses. (See *Amergen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-07-08, 65 NRC 124 (2007).) In 2009, the U.S. Court of Appeals for the Third Circuit upheld the Commission's position that terrorist attacks are too far removed from the natural or expected consequences of agency action to require an environmental impact analysis. (*New Jersey Dept. of Environmental Protection v. U.S. Nuclear Regulatory Commission*, 561 F.3d 132 (2009)). Even so, this EIS will include a discussion of terrorism that the NRC believes satisfies the Ninth Circuit's holding in the *Mothers for Peace* decision. Assuming that there are no legislative or judicial developments that affect the status quo, the staff plans to assess the long-term impacts at a generic level, assuming present-day threat scenarios, security measures applied by licensees, and the classified results of security assessments. The staff's proposed scope for assessing terrorism impacts may be adjusted based on the results of the technical analyses for EST and may also be informed by the ongoing rulemaking for 10 CFR Part 73, "Physical Protection of Plants and Materials." Further, the staff recognizes that threat scenarios may change. As part of its regulatory oversight, the NRC will respond to specific threats and continually assess the need for associated security measures as threat environments change.

Strategy for Integrating Extended Storage and Transportation Project Plan and Waste Confidence Rule Update Activities

Staff Requirements Memorandum (SRM)-COMSECY-10-0007, "Project Plan for Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel," dated December 6, 2010, directed U.S. Nuclear Regulatory Commission (NRC) staff to develop a plan to address the integration of the plans for extended storage and transportation (EST) and the waste confidence (WC) update. The Commission also directed the staff to prioritize the main elements of the plan and present a discussion of the impacts on activities that may be deferred because of the WC update. This enclosure presents the main elements of the plans that will be integrated and includes a discussion of the activities that might be deferred because of the WC update.

Status of Extended Storage and Transportation Activities

The staff is implementing the current EST project plan¹ in accordance with the partial approval in SRM-COMSECY-10-0007. The staff is leveraging and adjusting current research plans, and is performing gap assessments to identify areas of additional research, relative priorities, and potential policy issues that need to be addressed to bolster the technical basis for EST. In parallel, the staff is monitoring national developments in EST activities and has engaged various stakeholder groups through various industry meetings, workshops, public meetings, and conferences.

The staff has used the information from these interactions to identify regulatory and technical issues, and identify important research activities that are needed to bolster the technical basis. The staff plans to hold a public workshop in the summer of 2011 with industry and other groups to solicit input on technical and regulatory issues related to EST challenges. The staff will seek further opportunities to engage specific stakeholders and share technical information to ensure that EST activities are fully informed. Below is a summary of major activities by external organizations that are addressing EST issues of interest to NRC.

The U.S. Department of Energy's (DOE's) Blue Ribbon Commission on America's Nuclear Future (BRC) has established a transportation and storage subcommittee to address whether the United States should change storage practices for spent nuclear fuel (SNF) and high level waste (HLW) while one or more final disposal locations are established. The subcommittee has held several meetings to gather information from various stakeholders. The meetings thus far have addressed many topics, such as the role of storage in U.S. SNF management strategies, technical uncertainties in long-term storage, transportation safety and security issues, storage at decommissioned power reactor sites, and siting and transportation issues associated with potential interim storage facilities. The NRC staff has participated in some of these meetings to provide its perspectives on storage and transportation regulatory issues. The staff also monitors BRC meetings and informs NRC management of strategic and emergent issues. The BRC has also commissioned development of a specific study on SNF and HLW transportation in the

¹ The "current EST project plan" refers to the staff's "Project Plan for Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel," dated June 15, 2010 (ADAMS Accession No. ML101390216). A high-level EST Regulatory Program (discussed in next section) will integrate EST project plan activities and future WC activities. It is under development and will supersede the current EST project plan, as discussed here within.

United States. The BRC intends to issue draft and final recommendations to the DOE in July 2011 and January 2012. The staff plans to evaluate the studies and recommendations of the BRC, and consider them within the context of EST and WC activities as appropriate.

The Electric Power Research Institute (EPRI) is facilitating its Extended Storage Collaboration Program (ESCP) to review the current technical bases for storage licenses, evaluate ongoing gap analyses, conduct field studies and experiments to address gaps, and promote a dry storage cask demonstration and monitoring program for current storage technologies and high-burnup fuel. Some objectives of the ESCP demonstration program are to develop confirmatory data for long-term aging effects, provide long-lead indicators for any unanticipated phenomena, and develop data necessary to ensure a safe EST capability. The NRC staff regularly participates in ESCP meetings along with EPRI, DOE, utilities, cask vendors, and international participants to share technical information and provide regulatory insights, as appropriate.

DOE's Office of Nuclear Energy is conducting its own analyses to develop a technical basis to support the extension of long-term storage of commercial SNF for up to 300 years with subsequent transportation; the NRC staff believes that these analyses could inform the technical basis for the WC update. The DOE program is divided into four areas: (1) research and development projects focused on the identification and prioritization of technical gaps that need to be addressed to develop the technical arguments for EST; (2) an assessment of the security implications of extended storage and subsequent transportation; (3) an evaluation of the concepts necessary to integrate the research and design work with the security work and to assess options for conducting the research; and (4) an evaluation of the transportation issues in the overall assessment of the management of SNF. The pace of DOE's technical gap assessments is generally consistent with the pace of ongoing NRC regulatory gap assessments. NRC staff frequently communicates with DOE to discuss and share insights on technical and regulatory gaps.

The Nuclear Waste Technical Review Board (NWTRB) is an independent agency that provides scientific and technical oversight of DOE's program for managing and disposing of high-level radioactive waste and spent nuclear fuel. The NWTRB has independently developed a comprehensive report regarding the evaluation of the technical basis for extended dry storage and transportation of SNF. Staff will continue to consider regulatory gaps identified by DOE and NWTRB, and will continue to share information through various forums, as appropriate.

Some countries, such as Japan and Germany, have active national programs to assess extended storage issues with their cask storage technologies. The NRC staff routinely engages with these countries through various forums, such as technical and regulatory conferences, International Atomic Energy Agency consultancy activities, EPRI ESCP meetings, and cooperative agreements. The staff will continue to seek opportunities to share research on common technical issues and to work with international counterparts to support the technical basis of EST.

Integration of Activities into the Extended Storage and Transportation Regulatory Program

Based on the direction in SRM-COMSECY-10-0007 and SRM-SECY-09-0090, "Final Update of the Commission's Waste Confidence Decision," dated September 15, 2010, the staff will integrate activities into an EST Regulatory Program with two main goals: (1) update the Waste Confidence decision and rule to ensure the continued long-term stability of the generic safety and environmental findings in the rule by developing a NEPA analysis (in this case an EIS) that continues to be informed by current circumstances and scientific knowledge, and (2) enhance the technical and regulatory basis of the existing regulatory framework (i.e., 10 CFR Parts 71, 72, and 73) to identify and resolve technical, environmental, and regulatory issues associated with regulation of SNF for extended periods. Figure 2-1 illustrates how the current EST project plan activities support and align with related analyses needed to support the EIS and WC update. The staff will transform the EST project plan into a high-level EST Regulatory Program with integrated goals, key research objectives and key milestones for both EST and WC activities. The staff will also issue the draft gap assessments and preliminary scope of the EIS (see Enclosure 1) for stakeholder comment in November 2011. The staff will update the EST Regulatory Program and finalize the gap assessment in April 2012. The following discussion describes the major elements of the current EST project plan, and how staff will integrate them with the new WC activities.

Extended Storage and Transportation Safety Program Review

As described in Section 3.1 of the current EST project plan, the staff is conducting a gap assessment to enhance the technical safety basis for the EST regulatory framework. SNF storage systems may need to perform their intended functions beyond the current license periods of 20 or 40 years. The safety program review focuses on bolstering the technical basis for EST to ensure that the NRC is positioned to regulate the safety of extended storage facilities and extended aging management programs. The technical analyses of cask system performance will initially consider storage periods up to 300 years.

The staff will expand these assessments to examine the relative importance of environmental factors and to identify any additional research and analyses needed for the EIS. The priority and scope of research activities generally will be determined by a combination of (1) the potential impacts of long-term aging phenomena and site environments on SNF and key storage and transportation cask components; (2) the staff's knowledge of aging phenomena and capabilities to monitor and detect long-term degradation; (3) the relative importance of key components in maintaining long-term safety under an enhanced aging management framework; and (4) the potential impacts of significant aging management activities on the environment. Given the close relationship between an enhanced EST aging management regulatory framework and the technical information needed for the EIS, most of the research and analyses are expected to support both goals. However, the staff may adjust the scope and depth of activities in each technical area to address specific objectives of both the WC update and the EST regulatory framework.

Based on the preliminary results of the ongoing EST gap assessments, the staff has identified key areas that should be assessed and is adjusting research plans to address these areas.

These high-priority areas include long-term canister shell and weld integrity, metallic seal and lid bolt integrity, and concrete overpack integrity in various external environmental conditions. These components provide fundamental safety roles in confinement of SNF in normal environmental conditions and accident events.

Evaluation of SNF cladding integrity for extended periods of wet and dry storage modes is also a high priority. Cladding is the primary fission product barrier and should be preserved to the extent practical during the storage and transportation phases of the fuel cycle. However, the staff recognizes that the uncertainty associated with maintaining cladding integrity for extended periods (within spent fuel pools, dry cask storage, and subsequent transportation) may require the consideration of new mitigating solutions to safely manage a large population of fuel. There is limited data regarding the performance of cladding integrity in wet storage modes for periods beyond 60 years. Operational monitoring alone is currently used to identify potential cladding problems during wet storage. The monitoring data may not be sufficient to predict and identify cladding aging effects during extended wet storage, which may impact handling capability and criticality safety over long periods. Embrittlement of high-burnup cladding after long-term storage also may be a limiting condition under current transportation safety requirements.

Research of long-term cask monitoring is also a high priority. This research will provide insights on the detection and mitigation of safety significant degradation during extended periods. As further described in Section 3.1 of the current EST project plan, the staff is participating with DOE, EPRI, and the industry in the initial planning of a long-term cask demonstration and monitoring program (with high burnup fuel). The staff considers this external initiative a high priority activity because it could ultimately validate extrapolations from short-term data to predict long-term behavior. Long-term monitoring may also proactively identify unknown detrimental aging effects before it would become a problem for a large cask population in extended operations.

The staff may identify additional research that is needed to address environmental issues related to alternate disposal and reprocessing scenarios. On-going internal environmental scoping assessments will help the staff determine which research efforts should be completed before finalizing the EIS, and which activities may continue after the EIS is published to fully inform an EST aging management regulatory framework. The staff will revise the specific plan for the WC update if research involving accelerated testing and analyses with bounding assumptions cannot adequately evaluate high-priority safety and environmental issues in the WC update (see Enclosure 1).

Extended Storage and Transportation Security and Financial Reviews

As described in Section 3.1 of the current EST project plan, the staff planned to perform a financial gap assessment to identify any financial assurance or financial qualification issues related to EST activities. The financial review is a low priority, and has been deferred until all EST gap assessments (safety and security) are finished, the final BRC recommendations are available, and the WC EIS is more fully developed. As described in Section 3.2 of the current EST project plan, the staff plans to perform a security gap assessment to identify any additional research needs for EST security. This activity is a medium priority, and is currently deferred until completion of the integrated safety and environmental gap assessments, and completion of the ongoing 10 CFR Part 73, "Physical Protection of Plants and Materials," storage rulemaking

activity. Upon completion of these activities, the staff will formulate plans for addressing EST security. In the interim, the staff will address security issues only to the extent they need to be examined as part of the WC update. The staff will later inform the Commission of plans for addressing the EST security and financial issues, as directed in SRM-COMSECY-10-0007.

Extended Storage and Transportation Environment Program Review

As described in Section 3.3 of the current EST project plan, the staff had planned to conduct an environmental gap assessment for a generic environmental impact statement (GEIS) to directly support EST regulatory enhancements. The current environmental scoping efforts and WC EIS should accomplish some of the objectives of the potential GEIS described in the current EST project plan. However, the WC EIS would not replace any EIS or environmental assessment that may be needed to support specific rule changes or future licensing actions. The staff will defer development of a separate GEIS as currently described in the current EST project plan. The staff will consider the need for additional generic environmental analyses, to directly support a major rule change or a class of major licensing actions (e.g., regional storage facilities), upon completion of the WC EIS.

Cross-Cutting Strategies

As described in Section 4 of the current EST project plan, the staff plans to consider various cross-cutting strategies, such as risk-informing, international cooperation, codes and standards, state-of-the-art technology incentives, and stakeholder participation. The staff believes these cross-cutting activities will improve the technical basis for EST; will address previous Commission direction²; and are necessary to meet other agency strategic objectives. The staff will pursue these activities as resources allow, but generally as lower priority activities. The comprehensive risk-informed and performance-based enhancements (as described in Section 4.1 of the EST project plan) will be deferred in the near term. However, limited risk assessments and associated research activities will be pursued to directly inform the expanded gap assessments and the EIS.

Other cross-cutting strategies—such as international cooperation (in terms of comparing international standards), domestic codes and standards development, and state-of-the-art technology incentives—will also be deferred in the near term to allow the staff to focus on higher priority WC update and EST research activities.

As described in Section 4.5 of the EST project plan, stakeholder participation remains paramount in developing the technical basis for EST and the WC update and is a very high priority activity. The staff will adjust communication plans and continue to engage various stakeholders for both EST framework and WC update activities.

² COMDEK-09-0001, “Revisiting the Paradigm for Spent Fuel Storage and Transportation Regulatory Programs,” dated August 9, 2009.

Prioritization of the Extended Storage and Transportation Project Plan and Waste Confidence Update Activities

Table 2-1 further specifies the relative priorities of major elements of the current EST project plan and future WC update activities that are known at this time. The new EST Regulatory Program will be developed to implement the activities within the scheme of the relative priorities and the timeframe for completing the WC update and EST framework updates with available resources. The staff will periodically adjust the relative priorities as gap assessments are completed, and new information becomes available through NRC research and the initiatives of external organizations.

The new WC activities were not budgeted for fiscal year (FY) 2011 and FY 2012. The staff will realign available resources for the current EST project plan to focus on both EST and WC update activities, according to relative priority. In general, high-priority and medium-priority activities need to be completed to achieve the main goals of the EST Regulatory Program. The staff will pursue high-priority activities first within the shortest feasible timeframe, given available resources. The staff will pursue medium-priority activities in parallel, but resource availability could affect the start times and pace of activities. Low-priority activities are important to EST Regulatory Program goals, but may not be essential to the WC update. Low-priority activities will be deferred or reduced in scope as a result of any resource constraints or competing need to complete high- and medium-priority activities.

Enclosure 3 discusses projected resource needs and future budget planning. The addition of high-priority WC activities to existing EST activities within the current budgets for FY 2011 and FY 2012 (without additional funding) will result in the following impacts on current EST Regulatory Program activities: (1) some high-priority research and analyses in FY 2012 will start as soon as possible, but may initially progress at a slower pace; (2) some medium-priority research and analyses in FY 2012 may be delayed until FY 2013; and (3) low-priority EST activities will likely be deferred until FY 2013 or FY 2014.

**Table 2-1 Prioritization of the EST Regulatory Program
(Elements of Current EST Project Plan and New WC Update Activities)**

Activity	Priority	Basis
Integrated EST/WC Gap Assessment	High	Safety and WC EIS gap assessment and scoping activities are high priority. These activities are necessary to identify additional research and analytical needs to develop the WC update and enhance the EST regulatory basis. (Financial and security gap assessments are currently deferred)
Draft Gap Assessment(s) for Comment	High	
Final Gap Assessment	High	
Supporting Research and Analyses	High to Low	The staff has identified research activities on canister integrity, seals and bolts, structural concrete, cladding integrity, and environmental conditions as high-priority activities based on preliminary results from NRC and DOE gap studies. The staff intends to expand ongoing research in these areas to support the technical basis for an enhanced EST framework and to inform the WC update in a timely manner. Progress on a cask demonstration program to provide long-term data on cask performance is a high priority. Other storage and transportation components, reprocessing, and alternate disposal technical issues have a medium or low priority. For planning purposes, they are expected to require further analyses to inform potential scenarios in the EIS. These activities will be prioritized at the completion of the draft integrated gap assessments. Other research activities may be important to the EST regulatory basis, but are not as essential for the EIS, and are tentatively considered medium priorities.
Canister Confinement Boundary	High	
Seals and Bolts	High	
Concrete Overpack	High	
High-Burnup Fuel Integrity	High	
Neutron Absorbers	Medium	
Other Cask Components	Low	
Long-Term Cask Monitoring Needs	High	
Site Environmental Conditions (EIS)	High	
Reprocessing Issues (EIS)	Low	
Alternate Disposal Issues (EIS)	Low	
Limited Risk Assessments (EIS)	Medium	
U.S. Cask Demonstration Program	High	
International Research Coordination	Medium	
Stakeholder Participation	High	
WC Rule	High	Development of the WC update is designated as a high-priority rulemaking, per SRM-SECY-09-0090.
EIS Prescoping Assessments	High	
EIS Public Scoping Process	High	
Final EIS and Generic Safety Findings	High	
Updated Waste Confidence Rule	High	
EST Regulatory Basis Development	Medium to Low	Development of an enhanced regulatory basis for EST rulemaking is important, but generally a medium priority compared to the priority of the WC update. Additional activities, such as international cooperation on regulations and enhanced codes and standards, address previous Commission direction in COMDEK-09-0001 and are important in meeting other agency strategic objectives; but are generally not essential for developing the WC update and near-term EST needs.
Updated EST Guidance	Medium	
Rulemaking Regulatory Basis (if needed)	Medium	
Risk-Informed Enhancements	Medium	
International Cooperation	Low	
Enhanced Codes and Standards	Low	
Security Program Review	Medium	
Financial Assurance Review	Low	

Figure 2-1 Extended Storage and Transportation Regulatory Program

