

# **U.S. NUCLEAR WASTE TECHNICAL REVIEW BOARD**



## **FISCAL YEAR (FY) 2017 CONGRESSIONAL BUDGET JUSTIFICATION** *INCLUDING BOARD PERFORMANCE GOALS FOR FY 2016-2017 AND EVALUATION OF BOARD PERFORMANCE FOR FY 2015*

**FEBRUARY 9, 2016**



# U.S. NUCLEAR WASTE TECHNICAL REVIEW BOARD

## CONGRESSIONAL BUDGET JUSTIFICATION

### FISCAL YEAR 2017

## SUMMARY

The U.S. Nuclear Waste Technical Review Board is an independent agency in the Executive Branch of the federal government. The Board performs ongoing and objective peer review of the technical and scientific validity of activities undertaken by the Secretary of Energy related to implementation of the Nuclear Waste Policy Act (NWPA) (P.L. 97-425, as amended), including the packaging, transportation, and disposal of spent nuclear fuel (SNF) and high-level radioactive waste (HLW). The Board also advises and makes recommendations to Congress and the Secretary on technical and scientific issues related to nuclear waste management and disposal. The Board's independent technical and scientific evaluation is intended to enhance confidence in the technical and scientific process.

The Board's Budget Request for fiscal year (FY) 2017 is \$3,600,000, which is the same amount as the agency's appropriation in FY 2016. The Board's request reflects its continued commitment to sound budgeting and cost-effective management practices. The funds will be used to support activities related to achieving the goals of the Board's Performance Plan for FY 2016-2017, maintaining expanded public access to the Board's deliberations, enhancing the skills of its professional staff, and continuing its review of DOE activities related to SNF and HLW packaging, transportation, and disposal.

## THE BOARD'S MISSION

The Board was established in the 1987 amendments to the NWPA to "...evaluate the technical and scientific validity of activities [related to managing and disposing of spent nuclear fuel and high-level radioactive waste] undertaken by the Secretary [of Energy], including

- (1) site characterization activities; and
- (2) activities relating to the packaging or transportation of high-level radioactive waste or spent nuclear fuel."

In accordance with this mandate, the Board acts as a source of independent expert advice to the U.S. Department of Energy (DOE) and Congress on technical and scientific issues related to nuclear waste management and disposal. In doing so, the Board performs objective, ongoing technical and scientific peer review of activities undertaken by DOE related to the management and disposition of commercial and DOE-managed SNF and HLW. Based on this evaluation, the Board reports its findings, conclusions, and recommendations to Congress and the Secretary of Energy.

## THE BOARD'S CONTINUING ROLE

For more than 20 years, DOE activities related to nuclear waste management focused on developing a deep geologic repository for the permanent disposal of SNF and HLW at Yucca Mountain in Nevada, and the Board provided findings and recommendations on the technical and scientific validity those efforts. DOE submitted a license application (LA) for authorization to construct a repository at Yucca Mountain to the U.S. Nuclear Regulatory Commission (NRC) in June 2008. In early 2010, DOE petitioned the NRC for permission to withdraw the LA. In 2011, the NRC suspended its review of the LA. In January 2012, DOE issued its *Strategy for the Management and Disposal of Used Nuclear fuel and High-Level Radioactive Waste* one year later. In August 2013, the U.S. Court of Appeals for the District of Columbia District ruled that NRC must resume consideration of DOE's LA for the Yucca Mountain repository. In 2014, the NRC published Volumes 3 and 4 of its safety evaluation report (SER) on Yucca Mountain; Volumes 2 and 5 were issued in early 2015. (Volume 1 had been issued in 2010.) In March 2015, the President made the determination that a separate repository for nuclear waste resulting from defense activities was required.

As the federal program for disposition of nuclear waste has evolved over the years, DOE has continued to be responsible under the NWPA for disposal of commercial and DOE-managed SNF and HLW. Similarly, the Board continues to be responsible for evaluating these DOE activities and for advising Congress and the Secretary on the Board's findings, conclusions, and recommendations.

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## THE BOARD'S PERFORMANCE PLAN FOR FY 2016-2017

On an annual basis, the Board identifies Performance Goals that support the accomplishment of Strategic Objectives established in the Board's Strategic Plan for the relevant period. The Strategic Objectives from the Strategic Plan for the period FY 2014-2018 are presented below, followed by the applicable Performance Goals for FY 2016-2017.

***Strategic Objective #1:*** *The Board will continue its technical and scientific evaluation of DOE activities related to implementation of the NWPA. Based on its evaluation, the Board will report its findings, conclusions, and recommendations to Congress and the Secretary.*

**Performance Goal 1-A:** In FY 2016-2017, the Board will evaluate and report on DOE's efforts to implement its plan for disposing of DOE HLW and, perhaps some DOE-managed SNF separately from commercial SNF. Consistent with recommendations to DOE in the Board's June 2015 Report, *Evaluation of Technical Issues Associated with the Development of a Separate Repository for U.S. Department of Energy-Managed High-Level Radioactive Waste and Spent Nuclear Fuel*, the Board will specifically review DOE activities related to:

- Research and development on waste form performance in different host-rock types after degradation of the waste form
- Developing a better understanding of the degradation rates of DOE SNF in potential repository geologic environments
- Evaluating proposed approaches and cost-benefit analyses of DOE plans to potentially repackage cooler Naval SNF into smaller disposal packages

- Developing plans for using deep boreholes to dispose of some HLW, including examining sealing technology and assessing whether more robust engineered barriers may be necessary

**Performance Goal 1-B:** In FY 2016-2017, the Board’s goals include hosting a workshop on deep borehole disposal of radioactive waste and issuing a report on Board findings related to DOE’s evaluation of the feasibility of deep borehole disposal (see Goal 2-C).

**Performance Goal 1-C:** the Board will review DOE activities related to the DOE *Strategy for Management and Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste*, including the following:

- Degradation of high-burnup SNF
- Degradation of dry-storage canisters
- Technical and scientific issues related to development of an interim storage facility
- Planning for a large-scale transportation program
- Evaluating options for transportation of SNF from shutdown reactors

**Performance Goal 1-D:** In FY 2016-2017, the Board will continue to evaluate technical and scientific activities undertaken by DOE’s Office of Environmental Management (DOE-EM) related to the management of SNF and HLW, including issues identified by the Board in its report on Management and Disposal of DOE-managed SNF (See Performance Goal 2-A).

***Strategic Objective #2:*** *The Board will develop objective technical and scientific information to advise Congress and the Secretary on technical and scientific issues related to SNF and HLW management and disposal. The Board will communicate such information to Congress and the Secretary in reports, correspondence, and testimony.*

**Performance Goal 2-A:** In FY 2016-2017, the Board will finalize and issue a report on the management and disposal of DOE-managed SNF stored at federal facilities. The report is the culmination of a four-year study by the Board of, among other things, the status of DOE-managed SNF and the facilities in which it is stored, the condition of the DOE-managed SNF, and the amounts of DOE-managed SNF being stored at Hanford, the Idaho National Laboratory, the Savannah River Site, and Fort St. Vrain.

**Performance Goal 2-B:** In FY 2016-2017, the Board will publish a report to Congress and the Secretary on technical information and issues that will be important to decision-makers related to the topics discussed at a workshop held in November 2013 on the implications of using large canisters for dry-storage of SNF.

**Performance Goal 2-C:** In FY 2016-2017, the Board will report on technical and scientific issues discussed at its workshop on deep borehole disposal, which will be held in October 2015.

**Performance Goal 2-D:** In FY 2016-2017, the Board will issue a report summarizing its activities since January 2013. The report will include archival material such as congressional testimony and correspondence to DOE and Congress.

**Performance Goal 2-E:** In FY 2016-2017, the Board will issue a report related to the Nuclear Waste Assessment System for Technical Evaluation (NUWASTE), a system analysis tool developed by the Board to support its evaluation of DOE activities. The NUWASTE Report will be a reference document, which will describe the tool and its capabilities. Included will be sample results to illustrate how NUWASTE can be used to analyze and compare different waste management strategies.

**Performance Goal 2-F:** In FY 2016-2017, the Board will develop “factsheets” on technical and scientific topics related to DOE’s implementation of the NWPA. The factsheets will be posted on the Board’s website and used to inform policy makers and members of the public on technical issues related to nuclear waste management.

***Strategic Objective #3:*** *The Board will compile technical and scientific information and report to Congress and the Secretary on its findings, conclusions, and recommendations from experience gained over more than twenty years of reviewing the U.S. nuclear waste management and disposal program and from observing waste management efforts in other countries.*

**Performance Goal 3-A:** In FY 2016-2017, the Board will update and extend the analyses presented in the Board’s December 2009 Survey of National Programs Report.

**Performance Goal 3-B:** In FY 2016-2017, the Board will issue a report on designing a process for repository site selection, including discussion of the approaches that have been used by the United States and other countries.

## **ACHIEVING THE BOARD’S STRATEGIC OBJECTIVES AND PERFORMANCE GOALS IN FY 2016-2017**

**Authority under the Law.** The Board has the necessary authority, under current law, to achieve its Strategic Objectives and Performance Goals.

**Establishing the Strategic Objectives and Annual Performance Goals.** The Board’s Strategic Goals and Objectives are established in its current Strategic Plan, which covers the period from FY 2014 to FY 2018. The Board identifies—on an annual basis—shorter-term Performance Goals that will lead to the accomplishment of the Strategic Objectives. Strategic Objectives and Performance Goals are included in the Board’s annual Performance Plan. The Performance Plan is the basis for the Board’s annual Budget Request Submittal.

**Technical Analysis.** Analyses of technical information are performed by Board members who serve part time with assistance from a small, full-time senior professional staff. On the basis of these analyses, the Board reports its findings, conclusions, and recommendations to Congress and the Secretary of Energy. When necessary, the Board is authorized to hire expert consultants to support its in-depth reviews of specific technical and scientific topics.

**Evaluating Board Performance.** The Board includes in its annual Budget Request Submittal an evaluation of the Board’s performance in achieving its annual Performance Goals for the preceding year. Progress toward achieving the Board’s Performance Goals is reviewed quarterly by Board management.

**Focusing Board Activities.** Board members and members of the Board's senior professional staff are assigned by the Chairman to lead Board activities, as appropriate. The Board maintains the option of organizing panels or working groups to help facilitate, integrate, and focus its technical review, and for other purposes.

**Information Gathering.** Much of the Board's peer review and information gathering takes place at open public meetings organized by the Board, where technical information is presented by DOE, its contractors, and representatives of other organizations involved in nuclear waste management, according to an agenda prepared by the Board. At these meetings, Board members and staff question presenters, and time is provided for input and comments from interested members of the public. The Board holds two or three public meetings each year. Board panels and other small groups of Board members and staff hold other meetings, as needed, to investigate specific technical and scientific topics. The Board's public meetings are announced in the *Federal Register*, typically four to six weeks before the meetings are held.

The Board also gathers information from site visits, visits to national laboratories and facilities, and meetings with DOE and national laboratory and contractor staff working on specific projects and programs. Board members and staff attend national and international symposia and conferences related to the science and technology of SNF and HLW management and disposition. From time to time, Board members and/or staff travel to other countries to meet with organizations involved in the management of SNF and HLW to observe their technical and scientific programs and best practices, perform benchmarking, and assess potential analogs, among other things. The information gathered as a result of these visits is used to enhance the Board's technical and scientific evaluation of DOE programs and to advise Congress and the Secretary of Energy.

**Communicating Board Findings, Conclusions, and Recommendations and Providing Access to Board Deliberations.** On the basis of the Board's evaluations and other information, the Board reports its technical and scientific findings, conclusions, and recommendations to Congress and the Secretary of Energy. The Chairman and other members of the Board and Board staff testify before Congress, as requested. Board reports, testimony, correspondence and meeting agendas, transcripts, presentations, and public comments are posted on the Board's website at [www.nwtrb.gov](http://www.nwtrb.gov). The Board has recently increased public access to its deliberations through the "webcasting" of its open public meetings. Webcasts are archived and are available on the Board's website.

**Management Goals for FY 2016–2017.** To enhance the effectiveness and efficiency of Board activities supporting its Strategic Objectives and Performance Goals, the Board has identified the following Management Goals for FY 2016-2017:

- The Board will maintain and enhance effective communications among Board members who are geographically dispersed. The Board will also facilitate communication among the Board members and the senior professional staff members who support the Board's technical and scientific review of DOE activities from the Board's offices in Arlington, Virginia.
- The Board will continue webcasting its meetings and making available the meeting webcasts on its website.
- The Board will endeavor to obtain information on DOE activities and conduct its review in the most cost-effective means possible.

- The Board will take actions to ensure that institutional memory and expertise can be passed on to succeeding Board members and staff, as well as to Congress, the Secretary of Energy, and interested members of the public. The Board will also provide opportunities for undergraduates or graduate students in technical or scientific disciplines related to the backend of the nuclear fuel cycle to gain practical experience by participating in a summer internship program.
- The Board will regularly update its technical resources and capabilities and assess the core competencies of its senior professional staff. The Board will develop and implement initiatives to identify, recruit when necessary, and retain, highly qualified professionals with the technical and scientific and related knowledge needed to support the work of the Board members and help the Board achieve its Strategic Objectives.

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## EVALUATION OF BOARD PERFORMANCE IN FY 2015

The Board's progress in meeting its annual Performance Goals is evaluated quarterly, and adjustments are made, as necessary. The Board uses the evaluations of its performance as input in developing its annual Performance Goals for the following fiscal year and revising, as necessary, its Strategic Objectives. The Performance Evaluation also is used as input to the development of the Board's budget submittal for the subsequent year.

Confidence in the basis for evaluating the Board's performance in achieving its annual Performance Goals is high and can be verified by accessing the referenced documents and records of the meetings on the Board's Web site at [www.nwtrb.gov](http://www.nwtrb.gov).

### Board Performance Related to Performance Goals for FY 2015-2016

Following are the Board's Performance Goals for FY 2015-2016 followed by an evaluation of the Board's performance in 2015 in accomplishing the Goals.

***Strategic Objective #1:*** *The Board will continue its technical and scientific evaluation of DOE activities related to implementation of the NWPA. Based on its evaluation, the Board will report its findings, conclusions, and recommendations to Congress and the Secretary.*

**Performance Goal 1-A:** In FY 2015-2016, the Board will continue to evaluate and report on the technical and scientific validity of activities undertaken by DOE's Office of Nuclear Energy (DOE-NE) related to implementing the NWPA, including disposal-related research and development and related actions identified in DOE's *Strategy*. Those activities include:

- Evaluation of whether direct disposal of existing storage containers used at utility sites can be accomplished in various geologic media
- Evaluation of various types and design features of engineered barrier systems and materials
- Evaluation of various geologic media for their impacts on waste isolation
- Evaluation of thermal management options for various geologic media
- Establishing cooperative agreements with international programs

- Developing an R&D plan for deep borehole disposal
- Planning for a large-scale transportation program
- Evaluating options for transportation of SNF from shutdown reactors

**Evaluation of Board Performance in FY 2015 Related to Performance Goal 1-A**

- In June 2015, the Board issued a Report: *Evaluation of Technical Issues Associated with the Development of a Separate Repository for U.S. Department of Energy-Managed High-Level Radioactive Waste and Spent Nuclear Fuel*. In the Report, the Board reviewed two DOE reports that recommended implementing a strategy for disposal of some DOE-managed HLW, and possibly some DOE-managed SNF, in a separate mined, geologic repository rather than commingling the DOE wastes in a single repository with commercial HLW and SNF. (Plans for the reconsideration of the commingling approach were discussed in DOE's *Strategy* document.) The DOE reports also recommended that DOE retain the flexibility to consider options for disposal of smaller DOE-managed waste forms in deep boreholes rather than in a mined, geologic repository. The Board did not take a position on the policy issue of whether DOE-managed waste should be disposed separately from commercial waste, but it did acknowledge that the change in policy would have significant technical implications.

In its Report, the Board identified a number of technical and scientific issues that should be addressed as DOE implements this new approach, including: the degradation of, and release rates from, DOE-managed SNF; research and development that may be needed to support repackaging and disposal of naval SNF canisters; and disposal of DOE-managed HLW and potentially some DOE-managed SNF in deep boreholes. The Board will continue following DOE activities in these areas and has scheduled a workshop on deep-borehole disposal that will be held in Washington, D.C. in October 2015.

- At a meeting in Idaho Falls, Idaho, in August 2014, the Board reviewed DOE work related to the management and disposition of SNF and HLW that are the responsibility of DOE. In an October 2014 follow-up letter to DOE, the Board commented on the following issues:
  - Closure of the Office of Civilian Radioactive Waste Management has resulted in a loss of the crucial linkage between the management of different waste types and the related transportation strategies. The Board recommended that DOE explicitly reassign responsibility for the coordination of all transportation activities for SNF and HLW.
  - The Board recommended that DOE assess the level of record preservation and retrieval capability of DOE field office site organizations and ensure that all records related to the past management of SNF and HLW are preserved and retrievable in order to support future waste-management activities.

**Performance Goal 1-B:** In FY 2015-2016, the Board will continue to review DOE activities related to its R&D program on the long-term dry storage of commercial SNF, including high burnup SNF.

### **Evaluation of Board Performance in FY 2015 Related to Performance Goal 1-B**

- At a Board meeting in Idaho Falls, Idaho, in October 2014, DOE discussed its research and development programs related to the storage and transportation of high-burnup fuels and accident-tolerant fuels. In a letter following the meeting, the Board made the following recommendations:
  - In addition to evaluating the performance in the reactor of the new accident tolerant fuels, DOE should also evaluate how the fuel types will perform during extended dry storage and subsequent transportation and disposal.
  - DOE should be more active in international efforts to understand better changes in fuel and cladding characteristics during extended periods of dry storage.
  - DOE should consider the infrastructure that may be needed to support research and development efforts related to high burnup SNF and to the periodic examination of the commercial SNF that is currently in dry storage at INL.

**Performance Goal 1-C:** In FY 2015-2016, the Board will finalize and issue a report on DOE SNF being stored at federal facilities that will eventually require disposal in a deep geologic repository. The report is the culmination of a four-year study by the Board of, among other things, the status of DOE SNF, the characteristics of the potential high-level radioactive waste forms resulting from processing SNF that will require disposal, the condition of the DOE SNF, and the amounts of DOE SNF being stored at Hanford, the Idaho National Laboratory, the Savannah River Site, and Fort St. Vrain.

### **Evaluation of Board Performance in FY 2015 Related to Performance Goal 1-C**

- A Board report, which will be titled — *Management and Disposal of U.S. Department of Energy Spent Nuclear Fuel*, is in the final stages of development. The Board plans to issue the report late in FY 2015 or early in FY 2016.

**Performance Goal 1-D:** In FY 2015-2016, the Board will continue to evaluate technical and scientific activities undertaken by DOE's Office of Environmental Management (DOE-EM) related to the management of SNF and HLW, including the classification of HLW waste forms for management and/or disposal.

### **Evaluation of Board Performance in FY 2015 Related to Performance Goal 1-D**

- At the Board meeting held in Idaho Falls, Idaho, in August 2014, the Board reviewed DOE activities related to managing and transporting DOE-managed SNF and HLW, including DOE's plans for packaging and preparing SNF for transfer out of Idaho by the 2035 deadline in the agreement between DOE and the State, the management of aging facilities and SNF, the technical basis for the process used for drying SNF, and the disposition of calcined waste being stored at INL. In October 2014 follow-up letters to DOE, the Board discussed these issues and made recommendations to DOE:
  - Future SNF Packaging Facility – DOE personnel noted that because the requirements and timelines for developing a repository or interim storage

facility are not known, establishing plans and designs for a facility to package DOE-managed SNF for transportation, storage, and disposal offsite cannot be finalized. A facility that has been licensed but not built for performing these activities for disposal at a Yucca Mountain repository was planned to be used for this purpose. The Board recommended that DOE review and update the scope of the proposed packaging facility, taking into account the possibility that some SNF could be stored at the site beyond 2035, and examine how this extended period of storage could impact the capabilities needed and the timing for packaging the SNF.

- Management of Aging Fuel and Facilities – There appear to be significant differences in the number and scope of activities for managing the aging of SNF and SNF facilities at Hanford and at INL. Some of the SNF at INL is stored in pool facilities that are 30 years old or more, while almost all SNF at Hanford has been cleaned, dried, and sealed in new multi-canister overpacks filled with inert gas, and stored in a new facility. The Board recommended that DOE develop a comprehensive system-wide strategy for managing aging SNF and SNF storage facilities and develop individual aging management plans for all types of SNF and SNF facilities. The strategy should be based on the expected period of storage and should take advantage of the experience of the NRC’s aging management programs.
  - Technical Basis for Drying SNF – INL used extensive mock-up testing of the drying unit, while Hanford relied more on modelled results to determine drying requirements. The Board recommended that DOE collect additional empirical data to develop an understanding of the important processes that can occur during drying and afterwards in a sealed container with SNF that may not have been effectively dried.
  - Disposition of Calcined HLW – DOE’s preferred technology for treating the calcined waste is hot isostatic pressing (HIPping), which does not meet the EPA requirement for using “Best Demonstrated Available Technology” (BDAT) for processing radioactive waste generated during reprocessing of SNF. The DOE will need to submit a petition to the EPA requesting that HIPping be accepted as a BDAT for the calcined waste. The Board will continue to monitor DOE activities in this area.
- Other issues discussed during the Board’s October 2014 letter to DOE following the meeting, include:
- DOE Standard Canister and Multi-Canister Overpack – DOE described challenges related to developing a standard canister, including the need to accommodate the large number of DOE-managed SNF types; the inconsistencies between DOE and NRC criticality regulations for transportation of SNF; the need for remote canister welding technology; and the need for advanced neutron absorbers for criticality control.
  - DOE also described issues that would need to be resolved to ensure that multi-canister overpacks (MCO) could be transported. Some of those issues are: the

completion of criticality analyses for MCOs with scrap baskets; the need to ensure availability of a specific commercial NRC-certified transportation cask to transport the MCOs; the need to finalize the design, including the number of MCOs in the transportation cask and the need for impact limiters in the cask, and the need to amend the certification of the commercial transportation cask to allow for transport of multi-canister overpacks. The Board recommended that DOE should resume efforts on developing a standardized canister and MCOs. Specifically, the Board noted that DOE should:

- Resolve criticality issues related to transportation of the SNF, and submit a topical report to NRC to confirm that the standard canister would meet the criticality safety requirement of preventing the intrusion of water under hypothetical transportation accident conditions.
  - To the extent DOE continues generic disposal research; it should assess the disposal of potential standard canisters and MCOs in different geologic settings.
  - Identify issues that could impact the ability to transport MCOs from Hanford to a geologic repository.
- The Board met in Augusta, Georgia in October 2014 to tour relevant facilities at the Savannah River Site (SRS) and to discuss issues related to the management and preparation for disposal of the SNF and HLW stored there. Following are Board findings and recommendations related to the meeting that were included in a letter sent to DOE in January 2015:
- Regarding the management of HLW and coordination between the DOE sites, the Board recommended that DOE place more emphasis on the exchange of lessons learned and the transfer of new technology, such as improvements in HLW melter performance and advances in melter designs. The Board suggests that this may be an appropriate role for the Tank Waste Corporate Board.
  - The Board recommended that DOE should task the SNF Corporate Board and the Tank Waste Corporate Board with employing a systems engineering approach; obtaining design and regulatory input from outside organizations; ensuring integration of efforts to transport and dispose of HLW, defense SNF; and commercial SNF; and making the integration efforts more transparent.
  - In the letter, the Board expressed its opinion that the Augmented Monitoring and Condition Assessment Program be accelerated to substantiate the condition of the fuel and facilitate future SNF handling, drying, and packaging operations.
  - The Board found that more data should be gathered to support the technical basis for continuing operation of the L Basin for an additional 50 years. Subsequently, the Board recommended that DOE consider further actions to validate the structural integrity of L Basin, including: obtaining and analyzing core samples of the L Basin structural concrete; expanding the visual

examination of the interior and exterior surfaces of the basin walls; obtaining and analyzing core samples of older representative concrete from other sources to gather data that can improve the understanding of the long-term performance of the concrete; and ensuring coordination with other efforts to study concrete aging.

- The Board recommended a study to compare the performance of DOE SNF and vitrified HLW in different geologic environments. The results of the work should be used to inform plans for processing SNF in H-Canyon.
- The Board noted that DOE and the onsite contractors at SRS have been successful in coordinating a broad-range of nuclear facilities that together represent most of the back end of the nuclear fuel cycle. The Board indicated that it was encouraged that DOE intends to utilize contractor technical exchanges and the DOE Corporate Board to improve communication among all the sites and the exchange of lessons learned.

**Strategic Objective #2:** *The Board will develop objective technical and scientific information to advise Congress and the Secretary on technical and scientific issues related to SNF and HLW management and disposal. The Board will communicate such information to Congress and the Secretary in reports, correspondence, and testimony.*

**Performance Goal 2-A:** In November 2013, the Board held a workshop on the impacts of SNF dry-storage container design on the waste management system and the geologic disposal of SNF in the United States. The workshop included participation by DOE, NRC, the nuclear industry, international experts, and the interested public. In FY 2015, the Board will publish a report to Congress and the Secretary on technical information and issues that will be important to decision-makers related to the topics discussed at the workshop.

#### **Evaluation of Board Performance in FY 2015 Related to Performance Goal 2-A**

- Completion of this Performance Goal has been deferred until FY 2016.

**Performance Goal 2-B:** In FY 2015-2016, the Board will issue a report summarizing its activities. The report will include archival material such as testimony and correspondence to DOE and Congress.

#### **Evaluation of Board Performance in FY 2015 Related to Performance Goal 2-B**

- The Board published its report on Board activities from January 1, 2008, to December 31, 2012, in December 2014.
- **Performance Goal 2-C:** In FY 2015-2016, the Board will develop “factsheets” on technical and scientific topics related to DOE’s implementation of the NWPA. The factsheets will be posted on the Board’s website.

#### **Evaluation of Board Performance in FY 2015 Related to Performance Goal 2-C**

- The Board’s summer intern, working with and under the supervision of senior professional staff, prepared a packet of six draft fact sheets on commercial SNF,

DOE-managed SNF, and DOE-managed HLW and vitrified waste. The fact sheets are currently being finalized in preparation for posting on the Board's website and will be used to provide useful technical information to members of the interested public, congressional staff members and others, and to supplement and enhance understanding of the Board's activities related to its review of the management and disposal of DOE-managed SNF and HLW.

**Performance Goal 2-D:** In FY 2015-2016, the Board will develop two documents related to its system analysis tool, NUWASTE:

- A report on different options for the disposition of SNF from light-water reactors in the United States, including (1) long term dry-storage of SNF, (2) permanent disposal of SNF in a geologic repository, and (3) a combination of reprocessing and geologic disposal.
- A reference document on NUWASTE, which will describe the system and its capabilities and include sample results to illustrate how it can be used to analyze and compare different waste management strategies.

**Evaluation of Board Performance in FY 2015 Related to Performance Goal 2-D**

- This Performance Goal has been revised. Information on the U.S. program from NUWASTE will be used to inform the Board's report on the implications of using large dry-storage canisters. The draft report on the NUWASTE system and capabilities has been prepared, and will be issued in early FY 2016.

***Strategic Objective #3:*** *The Board will compile technical and scientific information and report to Congress and the Secretary on its findings, conclusions, and recommendations from experience gained over more than twenty years of reviewing the U.S. nuclear waste management and disposal program and from observing waste management efforts in other countries.*

**Performance Goal 3-A:** In FY 2015-2016, the Board will update and extend the analyses presented in the Board's December 2009 Survey of National Programs Report.

**Evaluation of Board Performance in FY 2015 Related to Performance Goal 3-A**

- This Performance Goal has been deferred until FY 2016-2017 to allow the updated report to take account of significant changes expected in the disposal programs in some of the countries included in the scope of the report.

**Performance Goal 3-B:** In FY 2015-2016, the Board will issue a report on designing a process for repository site selection, including discussion of the approaches that have been used by the United States and other countries.

**Evaluation of Board Performance in FY 2015 Related to Performance Goal 3-B**

- In September 2015, the Board completed preparation of a comprehensive report in two parts – an overview and summary and the supporting detailed analysis. Following final editing, the report will be issued in printed copies early in FY

2016. The report discusses efforts in the U.S. and other countries to site a deep geologic repository for SNF and HLW and the socio-technical challenges that must be addressed and overcome to be successful. The Board takes no position in the report on whether a repository siting program for a first or second repository will or should be developed, but if policy makers decided to proceed with a repository siting program in the future, the Report provides important information and broad perspectives based on the experiences of this and other countries.

### **Board Performance Related to Board Management Goals for FY 2015-2016**

The Board's Management Goals for FY 2015-2016 and the Board's performance in accomplishing the goals in FY 2015 are displayed in the Table on the following page.

## EVALUATION OF PERFORMANCE RELATED TO MANAGEMENT GOALS IN FY 2015

<i>Performance Goal</i>	<i>Evaluation of Performance</i>
<ul style="list-style-type: none"> <li>The Board will maintain effective communications among Board members who are geographically dispersed. The Board will also facilitate communication among the Board members and the senior professional staff members who support the Board’s technical and scientific review of DOE activities from the Board’s offices in Arlington, Virginia.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The Board has established and continues to use an electronic “drop box” that facilitates Board member access to source literature, meeting materials, and draft Board documents. The drop box has broadened access and reduced the need for production of multiple paper copies of documents.</li> </ul>
<ul style="list-style-type: none"> <li>The Board will, to the extent feasible, enable access to the Board’s discussions and deliberations by interested members of the public.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The Board has implemented webcasting of its meetings. Webcasts are archived and available on the Board’s website <a href="http://www.nwtrb.gov">www.nwtrb.gov</a>.</li> </ul>
<ul style="list-style-type: none"> <li>The Board will endeavor to obtain information and conduct its review in the most cost-effective means possible.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The Board reduces costs and increases public participation by holding its meetings in venues in the vicinity of DOE facilities.</li> </ul>
<ul style="list-style-type: none"> <li>The Board will take actions to ensure that its institutional memory and expertise can be passed on to succeeding Board members and staff, as well as to Congress, the Secretary of Energy, and interested members of the public. The Board will also provide opportunities for undergraduates or graduate students in fields related to the backend of the nuclear fuel cycle to gain practical experience by participating in a summer internship program sponsored by the Board.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The Board has reinstated its earlier practice of producing reports summarizing its activities and program developments for specified periods. Such reports include archival lists of Board reports and meetings, archival copies of Board testimony and correspondence, biographies of Board members, and other information. The Board has also initiated a summer internship program to provide the opportunity for graduate students to gain practical experience by participating in the Board’s work.</li> </ul>
<ul style="list-style-type: none"> <li>The Board will regularly update its technological resources and capabilities and assess the core technical and scientific competencies of its senior professional staff. The Board will develop and implement initiatives to identify, recruit when necessary, and retain, highly qualified professionals with the technical and scientific knowledge needed to support the Board’s work and achieve its Strategic Objectives.</li> </ul>	<ul style="list-style-type: none"> <li>➤ After conducting an assessment of the core competencies of the senior professional staff, the Board has filled key vacancies in the last year. The agency has also provided training sessions aimed at honing the writing and communications skills of its senior professional staff to facilitate, expedite, and increase the clarity and usefulness of Board documents. The Board has updated some of its key IT systems in order to ensure that it is taking advantage of recent technological advances that introduce economies in time and cost.</li> </ul>

# **U.S. NUCLEAR WASTE TECHNICAL REVIEW BOARD**

## **Salaries and Expenses (Including Transfer of Funds)**

For necessary expenses of the U. S. Nuclear Waste Technical Review Board, as authorized by Public Law 100-203, section 5051, \$3,600,000 to be derived from the Nuclear Waste Fund and to remain available until September 30, 2018.

## **DETAILS OF BUDGET REQUEST JUSTIFICATION**

To fulfill its statutory mandate for reviewing the technical and scientific validity of activities undertaken by the Secretary of Energy related to nuclear waste management and for providing independent technical information and advice to Congress and the Secretary, the Board requests \$3,600,000 for FY 2017, which is the same amount as its appropriation in FY 2016. The Board's request reflects its commitment to efficient and cost-effective budget management practices.

A detailed explanation of the Board's request by Object Class follows.

### **Object Class 11.0, Salaries: \$1,998,000**

The estimate for this object class includes funding for 11 part-time Board members, Executive Schedule senior professional staff, and General Schedule support staff. The 11 part-time Board members are Special Government Employees, and, in accordance with the Board's enabling legislation, each member is compensated at the rate of pay of Executive Schedule Level III. The senior professional staff members support the work of the 11 part-time Board members in evaluating the technical and scientific validity of DOE activities related to the management and disposal of SNF and HLW. The General Schedule staff members perform administrative activities related to the Board's ongoing technical and scientific evaluation and the operation of the organization. Administrative support activities include budget preparation and financial management, dissemination of Board publications, information technology activities, facilities management, travel planning, management of meeting logistics, and preparation and implementation of Board responses to federal directives. The amount requested for Board member and staff salaries includes provision for a pay raise of 1.6 percent

### **Object Class 12.0, Civilian Personnel Benefits: \$500,000**

The estimate for this object class represents the government's contribution for employee benefits for staff and Board members.

### **Object Class 21.1, Travel and Transportation: \$250,000**

The estimate for this object class includes travel costs for Board members, staff, and consultants who are required to travel to Board meetings, professional meetings, conferences, orientation activities, national laboratories, and other events and venues related to accomplishing the Board's strategic objectives and performance goals as detailed in the Board's Performance Plan.

### **Object Class 23.0, Rental Payments to the General Services Administration: \$240,000**

The estimate for this object class represents the amount that the Board will pay to the General Services Administration under its contract for rental of the Board's office space in Arlington, VA.

### **Object Class 23.3, Communication, Utilities, Miscellaneous: \$40,000**

The estimate for this object class represents costs for long-distance and local telephone service, postage, local courier services, video teleconferencing, webcasting support, internet, and mailing services. Based upon an analysis of actual spending in the previous fiscal year,

the Board's request for this object class category has been reduced from the amount requested for FY 2016.

### **Object Class 24.0, Printing and Reproduction: \$40,000**

The estimate for this object class is for costs associated with creating and publishing Board reports that are required by statute to be sent to Congress and the Secretary of Energy at least twice per year. The estimate also includes the costs associated with the publication of additional reports, and technical materials, as well as the costs associated with publishing meeting notices in the *Federal Register*.

### **Object Class 25.0, Consultants: \$55,000**

The estimate for this object class includes funding for consultants to support and supplement Board and staff analyses of specific technical and scientific issues as authorized by Congress. Requested funding for this object class category also includes estimates for creative consultants to assist the Board in developing and implementing methods that will increase public on-line access to its deliberations, informational resources, and other Board matters.

### **Object Class 25.1/2, Contractual Services - Other: \$268,000**

The estimate for this object class includes contractual costs associated with accomplishing the Board's mission. Estimated commercial contract costs includes meeting-room rentals, stenography and audio visual support services, webcasting, and video recording equipment rentals for Public Board Meetings, facility maintenance agreements, and professional development for Board supervisors and staff. Other program support contracts include services for contracted commercial IT support and report editing and production.

### **Object Class 25.3, Contractual Services - Federal: \$84,000**

The estimate for the object class includes funding for administrative support services provided by other federal agencies such as payroll, accounting services, human resource related support related to management of official personnel folders, recording various personnel actions, and initiating personnel clearances. Also included is legal advice from the General Services Administration, security clearances through the Office of Personnel Management, building security services from the Department of Homeland Security, website hosting services from the Government Printing Office, and other support provided through miscellaneous interagency agreements. The Board's enabling legislation authorizes the procurement of necessary administrative services from the General Service Administration on a reimbursable basis. Based upon an analysis of actual spending in the previous fiscal year, the Board's request for this object class category has been reduced from the amount requested for FY 2016.

### **Object Class 26.0, Supplies and Materials: \$60,000**

This estimate includes anticipated expenses for office supplies, subscriptions to technical publications and on-line academic journals and research databases, meeting supplies, and off-the-shelf technical reports and studies.

### **Object Class 31.0, Equipment: \$65,000**

The estimate for this object class includes costs to purchase IT and other electronic equipment, including computer hardware and software. The object class includes funding for

the continuation of upgrades and ongoing maintenance to the Board's IT and physical security equipment, continuity of operations (COOP), support of E-Gov telecommuting efforts, and technical support for the management of the Board's electronic records and e-mail in accordance with the Office of Management and Budget and the National Archives and Records Administration's directives for "Managing Government Records and Email."

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## U.S. NUCLEAR WASTE TECHNICAL REVIEW BOARD

FY2017 Budget Request by Object Class  
(Figures Rounded in Thousands of Dollars)

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Object Class Code	Description	FY2015 Actual	FY2016 Actual	FY2017 Request
11.0	Salaries	\$1,938	\$1,967	\$1,998
12.0	Benefits	436	485	500
21.1	Travel and Transportation	225	250	250
23.0	Rent	233	238	240
23.3	Communications and Utilities	40	65	40
24.0	Printing and Reproduction	60	40	40
25.0	Consultants	58	60	55
25.1/2	Contractual Services - Other	200	270	268
25.3	Contractual Services - Federal	100	100	84
26.0	Supplies and Materials	50	60	60
31.0	Equipment	60	65	65
<b>Total Budgetary Request</b>		<b>\$3,400</b>	<b>\$3,600</b>	<b>\$3,600</b>
Total Full Time Equivalent (FTE) Employees		14	14	14