

1 OVERVIEW OF PUBLIC PARTICIPATION AND COMMENT PROCESS

On December 24, 1997, the Department of Energy (DOE) published a Notice of Availability (63 FR 7771) in the *Federal Register* for the *Draft Programmatic Environmental Impact Statement (PEIS) for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride* (DOE/EIS-0269). In accordance with the Council on Environmental Quality (CEQ) and DOE National Environmental Policy Act (NEPA) regulations, the notice invited interested agencies, organizations, and the general public to provide oral and written comments on the Draft PEIS.

This volume of the Final PEIS contains the comments and DOE's responses to comments received during the comment period. Chapter 2 contains photocopies of written submissions received by DOE on the Draft PEIS; DOE's responses to those comments are listed in Chapter 3. Chapter 4 provides the oral comments received at the public hearings and DOE's responses. Chapter 5 provides indices to comments and responses arranged by commentor name and by comment number.

1.1 TECHNOLOGY ASSESSMENT

On November 10, 1994, DOE published a Request for Recommendations (59 FR 56324) and an Advance Notice of Intent (59 FR 56325) in the *Federal Register* to prepare a PEIS for alternative strategies for the long-term management and use of depleted uranium hexafluoride (UF₆). The Request for Recommendations asked interested persons, industry and government agencies to submit suggestions for potential uses for the depleted UF₆ as well as technologies that could facilitate the long-term management of this material.

By publishing the Request for Recommendations, DOE offered a unique opportunity for the public to become involved in the Depleted Uranium Hexafluoride Management Program and provide input early in the decision-making process. In keeping with the DOE's intent to foster candid information exchange and ongoing two-way communication with stakeholders, two sets of information exchange forums/workshops were held at Oak Ridge, Tennessee; Paducah, Kentucky; and Portsmouth, Ohio: one in November/December 1994, after the release of the Request for Recommendations/Advance Notice of Intent, and one in July 1995, at the conclusion of the Technology Assessment phase of the Program. The purpose of these sessions was to explain the Depleted Uranium Hexafluoride Management Program and the Technology Assessment component, provide updates, solicit questions and comments, and foster awareness of the various opportunities for public participation.

A 60-day public comment period was announced; however, all responses, including those submitted after the end of the comment period, were evaluated. In all, 57 responses containing approximately 70 recommendations were received and evaluated, including five options under consideration by DOE. The *Technology Assessment Report for the Long-Term Management of Depleted Uranium Hexafluoride* (UCLR-AR-120372, June 30, 1995) provides a summary of the responses to the Request for Recommendations, the verbatim assessments of the Independent Technical Reviewers, and a summary of the evaluation results. The feasibility analysis in the report was used by DOE in developing alternative strategies for the long-term management of depleted UF₆.

1.2 SCOPING

The DOE published a Notice of Intent (61 FR 2239) to prepare a PEIS in the *Federal Register* on January 25, 1996. The notice invited interested agencies, organizations, and the general public to provide oral and written comments to determine the scope of the PEIS. After publication of the Notice of Intent, stakeholders were sent a letter announcing the schedule for the scoping meetings, a copy of the Notice of Intent, a comment form, and a fact sheet titled "Proposed Scope of Environmental Issues."

Rather than the traditional hearing format, a more interactive workshop format was used for the scoping meetings which were held in February 1996 near the three DOE storage sites in Paducah, Kentucky; Portsmouth, Ohio; and Oak Ridge, Tennessee.

During the 60-day public scoping period, comments were submitted in a variety of ways: through comment forms available at meetings and in mailings, by making an oral comment to a Program representative at a meeting, by mailing or faxing DOE, by calling the toll-free information line, by sending an e-mail or by using the CD ROM program at the meetings. All comments received were entered into a database and were considered in determining the scope of the PEIS.

A summary report, consisting of a compilation of the comments from the scoping period and their disposition/responses, is included in Appendix L to the PEIS. The issues raised during the scoping period were used in developing the details of the draft outline PEIS.

1.3 DRAFT PEIS HEARINGS

During the 120-day public comment period for the Draft PEIS, DOE held four public hearings to discuss issues and to receive oral and written comments. The hearings were held near the three DOE storage sites in Paducah, Kentucky; Portsmouth, Ohio; and Oak Ridge, Tennessee;

as well as in Washington, D.C. The Draft PEIS was made available to the public at the hearings, through mailings, the Depleted UF₆ website, and DOE public reading rooms.

The hearings on the Draft PEIS were an important component of the Program's continuing efforts to provide the public with opportunities to participate in DOE's decision-making process. In keeping with DOE's intent to foster candid information exchange and ongoing two-way communication with the public, an informal, interactive meeting format was chosen. An independent facilitator conducted the hearings that included an information exchange session and a question and answer period. As demonstrated during the scoping phase of the Program, interactive sessions were particularly effective for soliciting comments and gaining participation from the public.

To facilitate public involvement, there were a variety of ways to submit comments on the Draft PEIS. Written comments were accepted by mail, fax, Internet and e-mail. In addition, a toll-free telephone line was available. These methods augmented comments received from the public at the four public hearings. As during the scoping meetings, the public was able to submit both written and oral comments at the Draft PEIS hearings. Court reporters and note takers collected the oral comments offered by the public at each of the hearings. Chapter 4 contains the oral comments from each hearing with DOE's response to those comments.

1.4 COMMENTS ON THE DRAFT PEIS

DOE received approximately 600 comments contained within approximately 90 submissions on the Draft PEIS. The comments addressed a wide range of issues, encompassing technical, environmental, local, economic, and DOE policies. Comments were received from individuals, Federal and State agencies, local governments, foreign entities, and non-government organizations such as businesses, environmental and public interest groups.

Chapter 2 of this document (Volume III) contains photocopies of written submissions received by DOE on the Draft PEIS. Each document was assigned a commentor number. For those documents containing comments, each individual comment was delineated and assigned a unique identification number. This ensured that the comment tracking system tracked each comment, not just the document itself. It also provided DOE with greater detail as to the number of comments submitted in addition to the number of documents received.

After comments were delineated and numbered, each comment was assigned to one of five general categories based on the nature of the comment. In addition, key words were assigned within each category. The use of general categories and keywords facilitated the development of responses to comments and provided DOE with information concerning major issues raised by commentors. DOE's responses to comments are provided in Chapter 3. Where applicable, the responses identify

specific chapters, sections, or appendices in the Final PEIS that address the issue(s) raised in the comments.

1.5 MAJOR ISSUES RAISED BY COMMENTORS

As discussed in the previous section, the use of general categories and keywords identified major issues raised by commentors. These issues are presented below with DOE's general response to these comments. The approximate percentage of commentors that addressed each major issue is provided and indicates the importance of that issue to those stakeholders who submitted comments.

Comment

Approximately 45% of the commentors raised the issue of the suitability of the Paducah site for continued cylinder storage and conversion actions due to its proximity to several fault zones, particularly the New Madrid Fault. The largest recorded earthquake in the region (magnitude of 7.3 on the Richter scale) occurred in 1812 and was centered in the New Madrid fault zone; the epicenter was 60 miles southwest of the Paducah site.

General Response

The PEIS addresses the potential for seismic activity at each of the three storage sites in Sections 3.1.4.1, 3.2.4.1, and 3.3.4.1. Of the three storage sites, an earthquake which could cause more than slight damage is considered credible (though highly unlikely) only for the Paducah site.

The analysis of accident scenarios for continued cylinder storage (Section D.2.2 of the PEIS) was based on the range of potential accident scenarios considered in the safety analysis reports (SARs) for each of the three storage sites (LMES 1997f-h; the full citations are provided in Chapter 8 of the PEIS). The SARs were issued in February 1997 by the DOE's management and operating contractor, and were subsequently reviewed and approved by DOE in March 1997.

The SARs considered a range of potential accident scenarios that could be associated with current storage activities, including natural phenomena events such as earthquakes. The accidents considered in the PEIS for current depleted UF₆ cylinder storage were extracted from those evaluated in the safety analysis reports. The accidents selected for the PEIS analysis were those accident scenarios in the SARs that resulted in the greatest potential consequences at each of the three storage sites. These accidents did not include earthquake scenarios, which were found in the SAR analyses to have lesser consequences than the accident scenarios discussed in the PEIS. The text in Section D.2.2 of the PEIS has been modified to clarify this point. If the safety analysis reports are revised in the future, DOE will modify its cylinder management program to ensure that the safety of the cylinders is maintained.

Comment

Approximately 45% of the commentors expressed doubt about any widespread uses for the depleted UF₆.

General Response

DOE expects that in the future, uses will be available for some portion of the depleted UF₆ inventory. Potential depleted uranium uses include radiation-shielding applications. Uses for the fluorine products exist now in the aluminum, chemical, steel, and glass industries.

The DOE provided its initial plan for the conversion of depleted uranium hexafluoride, as required by Public Law 105-204, to Congress on March 12, 1999. In addition, the Department issued a "Request for Expressions of Interest for a Depleted Uranium Hexafluoride Integrated Solution Conversion Contract and Near-Term Demonstrations" on March 4, 1999. Responses to the request for expressions of interest will provide information to develop the Department's detailed procurement strategy for an integrated approach to the management of its depleted UF₆ inventory. A final plan, incorporating information from the private sector and other stakeholders, is expected to be issued in 1999.

DOE plans to continue its support for the development of government applications for depleted uranium products. The two representative use options described in Section 2.2 and Appendix H of the PEIS, use as uranium oxide and use as uranium metal as radiation shielding, were selected to provide a basis for comparing the potential environmental impacts of broad, programmatic management strategies. The selection of these use options for analysis in the PEIS was not intended to imply that the PEIS will be used to select a specific end-use or preclude other potential uses in the future. If a use strategy is selected in the Record of Decision, specific uses would be considered and evaluated in more detail in future planning and environmental analyses as appropriate.

Comment

Approximately 40% of the commentors favored rapid conversion of the depleted UF₆ materials instead of storage. Of those, approximately 85% favored conversion to U₃O₈ for either storage or ultimate disposition.

General Response

Based on the comments received on the Draft PEIS, DOE has modified its preferred alternative for the final PEIS (see PEIS, Section 2.5). DOE's revised preferred alternative is to begin conversion of the depleted UF₆ inventory as soon as possible, either to uranium oxide, uranium metal, or a combination of both, while allowing for use of as much of this inventory as possible. This would be accomplished through continuing the safe, effective management of the cylinder inventory; beginning prompt conversion of the depleted UF₆ into uranium oxide and HF or CaF₂; interim storage of the uranium oxide pending use; converting depleted UF₆ into depleted

uranium metal and HF or CaF₂ as uses for depleted uranium metal products become available; and/or fabrication of depleted uranium oxide and/or metal products for use.

Comment

Approximately 25% of the commentors requested the PEIS to address site-specific impacts for any proposed facility.

General Response

The PEIS evaluates broad programmatic strategies for the long-term management of the depleted UF₆ cylinder inventory, including strategies of long-term storage, use, and disposal. The evaluation of potential environmental impacts in the PEIS includes all of the activities that would be necessary to implement each of the alternatives (see Sections 2.1 and 2.2 of the PEIS). However, as a programmatic EIS, it does not propose any site-specific projects. Consequently, the impacts of some management activities, such as conversion, long-term storage, manufacture and use, and disposal, were evaluated using representative facility designs and environmental setting information. The characteristics of these representative designs and settings were selected to provide as substantive an assessment as possible and to allow for a comprehensive comparison of the strategy alternatives. The potential impacts from construction and operation of such representative facilities is included in the PEIS. Upon implementation of the strategy to be selected in the Record of Decision for the PEIS, additional NEPA reviews for any site-specific proposals would be prepared identifying the environmental impacts of site-specific projects and a range of alternative actions, including a "no action" alternative.

Comment

Approximately 45% of the commentors raised questions and concerns about the safety and adequacy of current management of the cylinders at the three DOE locations. Many of these concerns stemmed from cylinder inspection data showing that corrosion has occurred on numerous cylinders in the 50 years or so since cylinder storage at the three sites began.

General Response

DOE's current cylinder management program provides for safe storage of the depleted UF₆ cylinders. DOE is committed to the safe storage of the cylinders at each site during the decision making period and also through the implementation of the decision made in the Record of Decision. DOE has an active cylinder management program that involves upgrading of cylinder storage yards, constructing new yards, repainting cylinders to arrest corrosion, and regular inspection and surveillance of the cylinder and storage yard conditions.

Comment

Approximately 15% of the commentors opposed any unrestricted uses of the converted UF₆ products and questioned the process for radioactive release limits of such products as hydrogen fluoride (HF) or calcium fluoride (CaF₂).

General Response

As described in Section 2.2 and Appendix H of the PEIS, the two use options evaluated in the PEIS, use as depleted uranium oxide and use as depleted uranium metal as radiation shielding, are representative and were selected to provide a basis for comparing the potential environmental impacts of broad, programmatic management strategies. The selection of these use options for analysis in the PEIS was not intended to imply that the PEIS will be used to select a specific end use or preclude other potential uses in the future. If a use strategy is selected in the Record of Decision, specific uses would be considered and evaluated in more detail in future planning and environmental analyses as appropriate. Careful consideration would be given to whether the benefits of any proposed use outweigh the potential risks. Use of depleted uranium products, HF, and CaF₂ would be subject to DOE and/or NRC review and approval, depending on the specific use.

The ultimate decision concerning HF or CaF₂ production will depend on the conversion process selected, the residual uranium concentrations, market demand, and both public acceptance and regulatory considerations. In response to this uncertainty, the potential environmental impacts of options for both production and sale of HF, and production and sale or disposal of CaF₂ are considered throughout the PEIS.

Comment

Approximately 5% of the commentors favored conversion to uranium metal, followed by long-term storage, use, or disposal.

General Response

The PEIS analyzes two options for radiation shielding applications using depleted uranium. The uranium metal option would result in a spent nuclear fuel disposal package, primarily as part of a Multi-Purpose Unit (MPU).

The reasons that long-term storage and disposal options for uranium metal were considered but not analyzed in detail are provided in Sections 2.3.3 and 2.3.4 of the PEIS. Disadvantages associated with long-term storage or disposal of uranium metal include higher conversion cost, lower chemical stability than uranium oxides, and regulatory restrictions on the disposal of the metal form.

Comment

Approximately 5% of the commentors provided information and raised questions about the health effects of depleted uranium exposures.

General Response

The analyses of potential health impacts conducted for the PEIS addressed both the chemical and the radioactive toxicity of uranium as several different compounds: UF₆, UO₂F₂, U₃O₈, UF₄, and uranium metal. For normal operations, the chemical toxicity was addressed by comparing potential exposure amounts with the U.S. Environmental Protection Agency's reference dose for uranium. For accidents, the chemical toxicity was addressed by comparing potential intakes with: 1) the intake of 30 mg given as the threshold for potential irreversible kidney damage under U.S. Nuclear Regulatory Commission (NRC) guidance for certification of gaseous diffusion plants (NRC 1994a; the full citation is provided in Chapter 8 of the PEIS); and 2) the intake of 10 mg, which NRC publications give as the threshold for potential adverse chemical effects (generally temporary, reversible effects occur in the range from 10 to 30 mg of intake). The methodology for chemical toxicity analyses for uranium exposure is summarized in Sections 4.3.1.2.2 and 4.3.2 of the PEIS and discussed in greater detail in Sections C.5.1.2 and C.5.2.1.1. The methodology for radiological toxicity analyses is summarized in Sections 4.3.1.1.2 and 4.3.2 and discussed in greater detail in Sections C.4.1 and C.4.2. Chemical toxicity was assessed for each alternative, and the results of the accident analyses show that the largest potential impacts from accidental uranium releases would be chemical impacts. Please see text in Section 2.4.2.2 of the PEIS, which states "chemical effects (kidney damage) occur at lower exposure levels than radiological effects," and elaborates on the numbers of workers and members of the general public estimated to experience these adverse chemical effects under the various accident scenarios analyzed.

1.6 CHANGES MADE TO THE DRAFT PEIS

DOE has revised the Draft PEIS in response to the comments received. In general, the responses to comments provided in Chapters 3 and 4 of this volume indicate whether or not a change was made to the text of the PEIS in response to the comment and the nature of the change. The revisions to the PEIS generally consisted of the following types: (1) editorial revisions, consisting mostly of corrections of typographical errors; (2) consistency revisions, in which inconsistencies between sections or tables were corrected; (3) clarifications, in which additional information was provided to clarify or provide further details about information provided; and (4) additions to the PEIS of information in response to changes in the overall scope of the PEIS analysis. The most significant revisions to the PEIS are summarized below.

Revision of the Preferred Alternative. After careful consideration of the comments received, DOE revised the preferred alternative for the PEIS. The revised preferred alternative, as described in detail in Section 2.5 of the PEIS, calls for prompt conversion of the depleted UF₆

inventory to U₃O₈ and long-term storage of that portion of the U₃O₈ that can not be put to immediate use. Under the revised preferred alternative, conversion to depleted uranium metal would take place only if uses for the metal product become available. The impacts of the revised preferred alternative are discussed in Sections 2.5, 5.7 and 6.3.7 of the PEIS.

Discussion of Potential Life-Cycle Impacts. In response to commentors' requests for life-cycle impact analysis, a new section has been added to the PEIS (Section 5.9) that discusses the issues related to potential impacts of the long-term (beyond the year 2039) management of materials containing depleted uranium under all alternatives. However, because of the uncertainties associated with the events that would occur far into the future and with the regulatory atmosphere at that time, the discussion is limited to issues that would need to be considered and the options that would be available for managing the material beyond the year 2039.

Consideration of USEC-Generated Cylinders. In May and June of 1998, management responsibility for approximately 11,400 depleted UF₆ cylinders (approximately 137,000 metric tons) was transferred from the United States Enrichment Corporation (USEC) to DOE by the signing of two Memoranda of Agreement. The Memorandum of Agreement between DOE and USEC relating to depleted uranium generated prior to the privatization date was signed in May 1998 (DOE and USEC 1998a; the full citation is provided in Chapter 8 of the PEIS). It transferred management responsibility for approximately 9,400 cylinders (about 6,600 cylinders stored at Paducah and about 2,800 stored at Portsmouth) from USEC to DOE. A second Memorandum of Agreement between DOE and USEC relating to depleted uranium, signed in June 1998, transfers a total of about 2,000 depleted UF₆ cylinders from USEC to DOE between 1999 and 2004 (DOE and USEC 1998b). (The locations of these cylinders are not specified in this second agreement.)

To account for uncertainties related to the management of depleted UF₆ generated by USEC in the future, the analysis in the PEIS was expanded to consider management of up to 15,000 USEC-generated cylinders (approximately 180,000 metric tons). For the purposes of analysis, it was assumed that 12,000 of the USEC-generated cylinders would be managed at Paducah and 3,000 would be managed at Portsmouth. Chapter 6 has been added to the PEIS, and Chapter 2 and the Summary have been revised so the PEIS includes the impacts associated with the management of these additional USEC-generated cylinders.

