RAS 13537

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED 04/24/07

ATOMIC SAFETY AND LICENSING BOARD

SERVED 04/24/07

Before Administrative Judges:

Lawrence G. McDade, Chairman
Dr. Peter S. Lam
Dr. Richard E. Wardwell

In the Matter of	Docket No. 70-7004-ML
USEC INC.	ASLBP No. 05-838-01-ML
(American Centrifuge Plant)	April 24, 2007

MEMORANDUM AND ORDER
(Issuance of Redacted Initial Decision)

In a Notice dated April 13, 2007, the Licensing Board advised the parties that it was issuing on that date its Initial Decision, ruling on all of the issues that were the subject of the March 2007 evidentiary hearing in this proceeding. The Initial Decision, however, was not publicly released pending a review of whether export controlled, proprietary, or other privileged information was used in the Decision and, accordingly, should be redacted from the version of that document that would be publically released. In the Notice, the Board also established a process for party input on the issue of whether any information contained in the Decision should be afforded confidential treatment.

By a joint report dated April 17, 2007, the Board was advised that the parties have reviewed the Initial Decision and have no objection to its issuance as originally written, with the exception of the limited number of specific redactions that the parties proposed.[1] After reviewing the proposed redactions, and after hearing the views of the parties at a post-hearing conference on April 19, 2007, the Board grants in part, and denies in part, the joint motion to

[1] See NRC Staff's Proposed Redactions to LBP-07-06 (Apr. 17, 2007). The NRC Staff indicated that counsel for USEC, Inc. concurs with the Staff's proposed redactions.

redact the Initial Decision in this proceeding.

Accordingly, included as Attachment A to this Memorandum and Order is a copy of the Initial Decision, which varies from the version initially provided to the parties only in that (1) the header and footer "OUO-DOE NOFORN" have been replaced with "PUBLICALLY-AVAILABLE VERSION," and (2) certain information has been redacted as indicated by "**xxxxxxx**" in the Decision. The Office of the Secretary is authorized to place the redacted version of the Board's Decision, which has been identified as Attachment A, into the agency's ADAMS electronic record keeping system as a publically-available document.

The fact that in the Initial Decision the Board referenced transcript pages and/or exhibits the Board previously has determined should be withheld as containing export controlled, proprietary, or other confidential information should not be construed as permitting public disclosure of any of the previously-withheld transcripts, documents or portions thereof.

IT IS SO ORDERED:

FOR THE ATOMIC SAFETY
AND LICENSING BOARD[2]

/RA/

Lawrence G. McDade
ADMINISTRATIVE JUDGE

Rockville, Maryland
April 24, 2007

[2] Copies of this Memorandum and Order and the accompanying Attachment A were sent this date by Internet e-mail transmission to (1) Counsel for USEC and (2) Counsel for the NRC Staff.

ATTACHMENT A

LBP-07-06

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

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In the Matter of	Docket No. 70-7004-ML
USEC INC.	ASLBP No. 05-838-01-ML
(American Centrifuge Plant)	April 13, 2007

INITIAL DECISION

(Authorizing the Issuance of the American Centrifuge Plant License)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

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(American Centrifuge Plant)	April 13, 2007

INITIAL DECISION
(Authorizing the Issuance of the American Centrifuge Plant License)

I. INTRODUCTION

Before this Atomic Safety and Licensing Board (Board) is the application of USEC, Inc. (USEC) for authorization to possess and use source, byproduct, and special nuclear material (SNM) in order to enrich natural uranium to a maximum of ten percent uranium-235 (U-235) by the gas centrifuge process.[1] USEC proposes to do this at a facility – denominated the American Centrifuge Plant (ACP) – to be constructed at the U.S. Department of Energy (DOE) Portsmouth facility near Piketon, Ohio (Portsmouth facility).[2]

[1] Enrichment is the process of increasing the concentration of the U-235 isotope and decreasing the concentration of U-238. Uranium ore contains, on average, approximately 0.72 percent U-235 by weight. See NUREG-1834, Environmental Impact Statement for the Proposed American Centrifuge Plant in Piketon, Ohio, Final Report at xix (Apr. 2006) (NRC Staff Exh. 2) [hereinafter FEIS].

[2] Enriched uranium produced at the ACP will be used to manufacture fuel for commercial nuclear power reactors. The license being sought will not, however, permit the manufacture of fuel rods at the Portsmouth facility. See id.

On August 23, 2004, USEC filed a License Application pursuant to 10 C.F.R. Parts 30, 40, and 70, with the Nuclear Regulatory Commission (NRC or Commission) to obtain a thirty-year license to operate the proposed ACP. The NRC published a Notice of Hearing in the Federal Register[3] and the Commission referred this matter to the Board to conduct a hearing as required by the Atomic Energy Act of 1954, as amended (AEA).[4] Thereafter, a public interest group, the Portsmouth/Piketon Residents for Environmental Safety and Security, and an individual, Geoffrey Sea, filed petitions to intervene. Based on the pleadings submitted, and after hearing argument from the putative intervenors, the Board determined that neither Petitioner had presented an admissible contention.[5] Both Petitioners appealed the Board's Order and, on April 3, 2006, the Commission affirmed the Board's rulings as to both Petitioners.[6] Thereafter, between March 13 and March 21, 2007, the Board conducted an oral uncontested hearing in this proceeding.[7] Accordingly, the only matter remaining before the Board with regard to USEC's License Application is to decide those issues addressed to the Board by the Commission for resolution in this uncontested proceeding, which are explained below.[8]

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[3] 69 Fed. Reg. 61,411 (Oct. 18, 2004).

[4] AEA § 193(b), 42 U.S.C. § 2243(b) (2000); see also AEA §§ 53, 63; 42 U.S.C. §§ 2073, 2093 (2000).

[5] LBP-05-28, 62 NRC 585 (2005).

[6] CLI-06-09, 63 NRC 433 (2006); CLI-06-10, 63 NRC 451 (2006).

[7] See 42 U.S.C. § 2243(b); 10 C.F.R. §§ 70.23a, 70.31(e).

[8] See 69 Fed. Reg. 61,411; 10 C.F.R. §§ 30.33, 40.32, 70.23; see also infra pp. 4-6.

This Initial Decision embodies the Board's findings regarding all uncontested matters in the above-captioned proceeding. It is based on the Board's review of the record of this proceeding including, but not limited to, the oral evidentiary hearing. This Initial Decision is the final action by the Board in this proceeding and authorizes the Director, Office of Nuclear Material Safety and Safeguards, to issue to USEC a license for the ACP consistent with the provisions of the AEA, NRC regulations, and this Initial Decision.

As explained in detail below, the Board finds that USEC's License Application and the record of this proceeding contain sufficient information, and that the NRC Staff's review of the Application, has been adequate to support findings in accordance with the applicable standards contained in 10 C.F.R. §§ 30.33, 40.32 and 70.23. Specifically, we find that: (1) USEC has adequately described the design of the facility including, but not limited to, the principal architectural and engineering criteria, and has adequately identified the features and components incorporated in the design for the protection of the health and safety of the public; (2) USEC is technically and financially qualified to construct and operate the proposed ACP; and (3) the issuance of the license for the construction and operation of the ACP will not be inimical to the common defense and security or to the health and safety of the public.[9]

In addition, having performed an evaluation of the issues under the National Environmental Policy Act of 1969 (NEPA),[10] we have made an independent determination that, subject to the proposed permit conditions and commitments to be enforced through application

[9] See 10 C.F.R. §§ 30.33, 40.32, and 70.23.

[10] 42 U.S.C. §§ 4332-4335 (2000).

tie-downs,[11] the ACP License should be issued.

II. LEGAL STANDARDS GOVERNING THIS PROCEEDING

The AEA requires that, for license applications for uranium enrichment facilities, the NRC must hold a hearing even when the license is not contested.[12] When an application for a construction permit is uncontested – as is the case here – the procedures to be followed by the Licensing Board to ensure compliance with the applicable statutes and regulations are described at 10 C.F.R. § 2.104(b)(2), (3) and in the Commission's 2005 answers to a series of certified questions submitted by the Chief Administrative Judge of the Atomic Safety and Licensing Board Panel.[13]

In uncontested proceedings we are directed not to conduct a "de novo review." Rather, we should conduct a simple 'sufficiency' review of [the] uncontested issues."[14] In so doing, the Board should decide "whether the safety and environmental record is 'sufficient' to support license issuance. In other words, [B]oards should inquire whether the NRC Staff performed an adequate review and made findings with reasonable support in logic and fact."[15]

Recently, the Commission reiterated the appropriate depth for the Board's review. The Commission explained that the Board "must narrow its inquiry to those topics or sections in Staff documents that it deems most important and should concentrate on portions of the

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[11] Tie-downs are references to relevant license application documents that will be incorporated into the License by a specific license condition. See NRC Staff WDT/HTS-3 at 5-6.

[12] 42 U.S.C. § 2243(b); 10 C.F.R. §§ 70.23a, 70.31(e).

[13] Exelon Generation Co., LLC (Early Site Permit for Clinton ESP Site), CLI-05-17, 62 NRC 5 (2005).

[14] Id. at 39.

[15] Id.

documents that do not, on their face, adequately explain the logic, underlying facts, and applicable regulations and guidance."[16]

In conducting its "sufficiency" review, Licensing Boards are directed to make specific findings.[17] First, with respect to matters involving safety – i.e., issues pursuant to the AEA – Boards must determine whether the application and the record of the proceeding contain sufficient information, and the review of the application by the NRC Staff has been adequate, to support findings pursuant to 10 C.F.R. §§ 30.33, 40.32 and 70.23.

Second, with respect to matters involving the environment – i.e., issues arising from NEPA – Boards must:

> (1) Determine whether the review conducted by the NRC Staff pursuant to 10 C.F.R. Part 51 has been adequate;
>
> (2) Determine whether the requirements of Section 102(2)(A), (C), and (E) of NEPA and Subpart A of 10 C.F.R. Part 51 have been complied with in the proceeding;
>
> (3) Independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;
>
> (4) Determine, whether a license should be issued, denied, or appropriately conditioned to protect the environment.[18]

With regard to the so-called "baseline" NEPA issues (# 2, 3, and 4), the Board's function is not limited to passing on the adequacy of the NRC Staff's review. Rather, the Board must also independently determine whether the applicable requirements of NEPA have been complied with and, after considering the final balance among conflicting factors, independently

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[16] Exelon Generation Co., LLC (Early Site Permit for Clinton ESP Site), CLI-06-20, 64 NRC 15, 21-22 (2006).

[17] See 69 Fed. Reg. 61,411.

[18] Id. at 61,411-12.

determine whether the license should be issued, denied, or appropriately conditioned to protect the environment.[19]

III. REVIEW OF SAFETY-RELATED MATTERS

This Board has been charged to determine whether USEC's License Application satisfies the safety standards set forth in the Notice of Hearing and the applicable NRC regulations.[20] The Hearing Notice requires the Board to determine, without conducting a de novo evaluation of the application, whether the application and record of the proceeding contain sufficient information and whether the NRC Staff's review has been adequate to support the conclusions to be made by the Director of the Office of Nuclear Materials Safety and Safeguards with respect to the applicable standards presented above.

In fulfilling its responsibility to conduct a hearing in this matter, the Board issued an Order[21] that presented nine hearing topics and posed over forty questions relating to the NRC

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[19] See Exelon, CLI-05-17, 62 NRC at 45.

[20] See 69 Fed. Reg. 61,411; 10 C.F.R. §§ 30.33, 40.32, and 70.23.

[21] Licensing Board Order (Establishing Modified Case Schedule, Issuing Questions and Identifying hearing Topics) (Feb. 6, 2007) (unpublished) [hereinafter February 6 Order]. This order was issued in response to a Commission Order of February 1, 2007, CLI-07-05, 65 NRC _ (slip op.), which directed the Board to accelerate its proposed case schedule. See Licensing Board Order (Establishing Tentative Case Schedule) (Nov. 17, 2006) (unpublished). The previous schedule was formulated by the Board, in part, because two of the Board members were then involved in a hearing and the drafting of the Initial Decision in another proceeding, and the third member was scheduled to be out of the country for several weeks immediately prior to the proposed hearing date. With the previous schedule, the Board anticipated that it would issue questions to the parties based on our review of the Final Environmental Impact Statement (FEIS) and Safety Evaluation Report (SER), analyze the parties' responses to those questions, formulate hearing issues, analyze the written direct testimony filed by the parties in response to those hearing issues, and then conduct a hearing narrowly focused on those issues, if any, that remained unresolved. Given the acceleration of the hearing schedule necessitated by the Commission's Order of February 1, this procedure was significantly compressed. Accordingly, the parties were required, with very short deadlines, to respond to

(continued...)

Staff's safety review. After receipt of the Staff's responses,[22] the Board defined four more safety hearing topics and asked additional clarifying questions.[23] The resulting thirteen hearings topics related to safety are discussed below.[24]

As a preface, as noted above,[25] the Commission has directed the Board to concentrate our efforts on those portions of the NRC Staff's review where the facts or logic supporting important conclusions seemed incomplete or unclear. It was this guidance that informed our choice of the following hearing topics.[26]

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[21](...continued)
the Board's questions, which in some instances, lacked optimum focus. The parties did so in a very competent and professional manner. Without the energetic cooperation of both the NRC Staff and USEC, the Board would not have been able to meet the accelerated schedule for this proceeding that was set by the Commission. Accordingly, the Board commends the parties for the manner in which they promptly and comprehensively responded to the Board's questions.

[22] See NRC Staff Response to Atomic Safety and Licensing Board Order of February 6, 2007 1-5 (Feb. 20, 2007) [hereinafter NRC Staff February 20 Response]. The NRC Staff (and USEC) also submitted written direct testimony, which is referenced, as appropriate, below.

[23] See Licensing Board Memorandum and Order (Issuing Additional Questions and Hearing Topics) (Mar. 2, 2007) (unpublished) [hereinafter March 2 Order].

[24] The Board also presented three environmental hearing topics in our February 6 Order, and an additional three environmental hearing topics in our March 2 Order. These are discussed in Part IV, infra.

[25] See supra pp. 4-6.

[26] The NRC Staff submitted, on October 11, 2006, Proposed Findings of Fact and Conclusions of Law in the Mandatory Hearing. Exceptions were filed by USEC on October 19. See USEC Inc. Comments on NRC Staff's Proposed Findings of Fact and Conclusions of Law in the Mandatory Hearing. At the oral hearing, counsel for the Staff acknowledged that the exceptions by USEC were well taken, and had no objection to USEC's exceptions being incorporated into the Staff's Proposed Findings. See Tr. at 828-29. As modified to incorporate USEC's exceptions, the Board adopts the Staff's proposed findings of fact.

HTS-1.[27] **Facility Description**[28]

Pursuant to 10 C.F.R. §§ 30.32, 40.31, and 70.22, USEC's License Application must include information demonstrating that the equipment, facilities, and procedures to be used at the proposed ACP are adequate to protect health and minimize danger to life and property. In addition, pursuant to 10 C.F.R. § 70.65, USEC must submit with its application a description of its safety program – an Integrated Safety Analysis (ISA) – as delineated by 10 C.F.R. § 70.62.

Chapter 1 of the SER[29] describes the NRC Staff's review of the information in USEC's License Application with respect to the proposed facility and processes. In conducting its review of the facility and processes, the Staff followed the guidance in Chapter 1 of NUREG-

[27] "HTS-1" refers to Hearing Topic for Safety, number one. Each hearing topic is designated with either HTS (Safety) or HTE (Environmental).

[28] To address the Board's questions relating to facility description, the NRC Staff and USEC proffered expert witnesses who provided both written direct testimony (WDT) and oral testimony. The NRC Staff presented one witness, Mr. Yawar Faraz, Senior Project Manager, Technical Support Branch, Division of Fuel Cycle Safety and Safeguards (FCSS), Office of Nuclear Material Safety and Safeguards (NMSS). Mr. Faraz's professional qualifications are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTS-1: Facility Description (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-1]. USEC presented four witnesses: (1) Mr. Gregory S. Corzine, Nuclear Safety Manager for the ACP, USEC; (2) Ms. Sandra L. Fout, Engineering Manager for the ACP, USEC; (3) Mr. Victor N. Lopiano, Vice President, American Centrifuge, USEC; and (4) Mr. Daniel A. Towne, Lead Engineer, Advanced Technology Operations Analysis Group, USEC. The professional qualifications of each of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Issue HTS-1 (Facility Description) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-1].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding facility description relative to USEC's License Application.

[29] NUREG-1851, Safety Evaluation Report for the American Centrifuge Plant in Piketon, Ohio (Sept. 2006) (NRC Staff Exh. 1) [hereinafter SER].

1520, Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility.[30] NUREG-1520 lists the following acceptance criteria for determining whether an application conforms with the applicable regulatory requirements of 10 C.F.R. Parts 30, 40, and 70[31] as follows:

> (1) the application presents information at a level of detail that is appropriate for general familiarization and understanding of the proposed facility and processes;
>
> (2) the application summarizes the facility information contained in the ISA Summary, including descriptions of the overall facility layout on scaled drawings, the site's geographical features and facility structural features and transportation right-of-ways, and the relationship of specific facility features to the major processes that will be ongoing at the facility;
>
> (3) the major chemical or mechanical processes involving licensable quantities of SNM are described in summary form, based in part on information in the ISA Summary, and including references to the building locations of major process components, brief descriptions of process steps, the chemical forms and maximum amounts of SNM in process, and the types, amounts and discharge points of waste materials; and
>
> (4) the application presents a summary identification of the raw materials, by-products, wastes and finished products of the facility.[32]

The NRC Staff confirmed that USEC adequately provided a summary description of the proposed ACP and processes, provided an ISA Summary, described the major chemical and mechanical processes involving licensable quantities of SNM, and identified the raw materials,

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[30] See id. at 1-1.

[31] NUREGs and Regulatory Guides (RG) serve as guidance and do not prescribe requirements. They are not substitutes for regulations and are not binding authority. See Curators of the Univ. of Missouri, CLI-95-01, 41 NRC 71, 98 (1995); Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant), ALAB-852, 24 NRC 532, 544-45 (1986). Accordingly, in the Board's review we focused on compliance with the regulations, not compliance with a particular NUREG or RG.

[32] NUREG-1520 at 1-1 to 1-2.

by-products, wastes, and finished products expected at the facility.[33] Details regarding the facilities and procedures to be utilized at the ACP are described in the SER and were further described during the oral hearing. They need not be repeated here.[34]

Based on the acceptance criteria listed above, the NRC Staff found USEC had adequately described (1) the facility and processes so that the Staff has an overall understanding of the relationships of the features, and (2) the function of each feature.[35] As a result of our review of the record of this proceeding, the Board finds that the Staff's conclusions regarding the sufficiency of USEC's description of the proposed ACP and processes are sound and reasonable, and fully supported by the record of this proceeding.

HTS-2. DOE/NRC Memorandum Of Understanding[36]

In its sufficiency review of the safety record the Board raised questions relating to a Memorandum of Understanding (MOU) currently being developed between DOE and NRC to

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[33] See SER at 1-1 to 1-4.

[34] See Tr. at 134-225; NRC Staff Exhs. 3, 3A (Hearing Presentation for HTS-1).

[35] See SER at 1-3 to 1-4.

[36] To address the Board's questions relating to the DOE/NRC Memorandum of Understanding, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented one witness, Mr. Brian W. Smith, Chief, Enrichment and Conversion Branch, FCSS, NMSS. Mr. Smith's professional qualifications are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTS-2: DOE/NRC Memorandum of Understanding (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-2]. USEC presented one witness, Mr. Peter J. Miner, Director, Regulatory and Quality Assurance for the ACP, USEC. Mr. Miner's professional qualifications are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Topic HTS-2 (DOE/NRC Memorandum of Understanding) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-2].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding the DOE/NRC Memorandum of Understanding relative to USEC's License Application.

address regulatory oversight of the ACP.[37] Because the proposed ACP will be located on a DOE site (the Portsmouth facility) – using existing buildings previously used by DOE – and the ACP will be operated under a lease agreement with DOE, DOE has regulatory oversight authority relating to USEC's activities performed on the leased areas. In addition, the NRC also has regulatory authority over the licensed activities in the leased areas. The Board's inquiry focused on whether there are regulatory overlaps or gaps and whether such overlaps or gaps, if they were to exist, could have any adverse impact on the safe operation of the proposed facility.

The NRC Staff addressed the Board's inquiry by providing, in its written direct testimony, the following information: (1) the rationale for developing the MOU; (2) the anticipated schedule for completion of the MOU; (3) a latest copy of the draft MOU; and (4) a description of the principal areas covered in the MOU. Those principal areas include: the purpose and scope of the MOU; respective responsibilities of each agency prior to and after transition to NRC regulatory oversight, and following license termination; the interface between the DOE and NRC; and the procedures for the resolution of disputes between the two agencies.[38]

In response to Board questions at the oral hearing, the NRC Staff stated that the purpose of the MOU was to avoid duplication and to clearly delineate the responsibilities of DOE and NRC, which will help prevent wasted government resources by minimizing overlapping efforts by both agencies. Pursuant to the draft MOU, the NRC will continue to regulate the ACP through decommissioning and license termination, after which control of the site formerly used by the ACP will revert to DOE. In the unlikely event the MOU is not

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[37] See February 6 Order at 25.

[38] See NRC Staff WDT/HTS-2 at 2-7; see also NRC Staff Exh. 4A (MOU Between DOE and NRC, Cooperation Regarding the ACP in Piketon, Ohio).

completed by the time of license-issuance, the Staff emphasized that it will, nevertheless, be able to enforce all of the NRC regulations and requirements. However, the Staff fully expects to have the MOU in place by April 13, 2007, before the license would be issued.[39]

Based on the Board's review of the NRC Staff's written direct testimony and answers to our questions during the oral hearing regarding any potential changes in the MOU and the planned completion date,[40] the Board finds that the draft MOU is reasonably complete and reasonably ensures significant regulatory overlaps or gaps will not occur.

HTS-3. License Conditions[41]

As a part of the Board's sufficiency review of the safety record, we made the following inquiries regarding two proposed license conditions relating to the boundary definitions for items

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[39] See Tr. at 279-82.

[40] See id. at 279-85.

[41] To address the Board's questions relating to the USEC's license conditions, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented two witnesses: (1) Dr. Stan Echols, Senior Project Manager, Enrichment and Conversion Branch, FCSS, NMSS; and (2) Mr. Jay L. Henson, Chief, Fuel Facility Inspection Branch 2, Division of Fuel Facility Safety, NRC Region II. The professional qualifications of both of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTS-3: License Conditions (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-3]. USEC presented five witnesses: (1) Mr. John C. Barpoulis, Senior Vice President and Chief Financial Officer, USEC; (2) Mr. Gregory S. Corzine; (3) Mr. Donald J. Hatcher, Director or Risk Management, USEC; (4) Mr. Peter J. Miner; and (5) Mr. Mark D. Smith, Manager of Nuclear Licensing, USEC. The professional qualifications of each of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Topic HTS-3 (License Conditions) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-3].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding license conditions relative to USEC's License Application.

relied on for safety (IROFS),[42] and financial assurance for decommissioning. Specifically, the Board asked: (1) the NRC Staff to provide references to the SER or FEIS that prompted these license conditions; (2) what are the potential deficiencies these license conditions are intended to rectify; and (3) how will the Staff monitor USEC compliance with these license conditions.[43] In its written direct testimony the Staff provided the requested information for all thirteen proposed license conditions that address matters of nuclear criticality safety, the fundamental nuclear material control program, IROFS, the facility security program, financial qualifications, and funding arrangements.[44]

At the oral hearing, the Board questioned how the NRC Staff planned to monitor compliance with the proposed license conditions and whether there would be any priority in monitoring different license conditions. In addition, the Board sought the specific details of a proposed license condition involving special authorizations and exemptions identified in Section 1.2.5 of USEC's License Application.[45] The Staff explained the components of the inspection program that will be performed to ensure USEC's implementation of these conditions and described how compliance with the license conditions will concentrate on criticality safety, radiation safety, fire safety, and chemical safety aspects of plant operations, and will focus on review of the IROFS and on those compliance issues that have higher safety significance

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[42] The Staff clarified that IROFS are those controls that are required to meet performance specifications and to achieve compliance from the unmitigated, unprevented, non-complying accident sequence, e.g., reduce the likelihood of an accident. By their nature, IROFS require that a higher level of quality assurance and management measures be applied to them. Defense-in-depth items are additional controls used for backup. See Tr. at 386-87.

[43] See February 6 Order at 25.

[44] NRC Staff WDT/HTS-3 at 2-4.

[45] See Tr. at 311-15.

events.[46]

To further address the Board's questions regarding the license conditions, the NRC Staff provided a copy of USEC's request for special authorizations and exemptions as identified in Section 1.2.5 of the License Application. The Staff testified that in its judgment the two special authorizations and five exemptions should be granted, and has done so through one of the license conditions that was added since the SER was issued.[47]

The Board's review of the NRC Staff's written direct testimony, together with the testimony at the oral hearing leads us to find that the Staff adequately identified and rectified potential deficiencies in USEC's License Application by imposing necessary license conditions. The Staff concluded that these license conditions will ensure the protection of public health and safety, and the Board finds that there is adequate basis in fact and logic for this conclusion. The Board also finds that the Staff has developed an adequate plan to monitor license condition compliance, and that the Staff's focus on criticality safety, radiation safety, fire safety, and chemical safety, and on its review of IROFS and higher safety significant events is well placed and appropriate.

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[46] See Tr. at 314-15; NRC Staff WDT/HTS-3 at 7.

[47] See NRC Staff WDT/HTS-3 at 5-7; Tr. at 311-12. In addition to granting these special authorizations and exemptions, additional license conditions incorporate the "tie-downs" which reference relevant license application documents, clarify the requirements for fundamental nuclear material control, and require 120 days notification by USEC to the NRC prior to the introduction of UF_6 into any module of the ACP.

HTS-4. Exemption Requests[48]

The Board's initial focus of inquiry regarding USEC's exemption requests was on the process used by the NRC Staff in evaluating whether the exemption should be granted, and on the potential impact to plant safety that these exemptions might have.[49] In its written direct testimony, the Staff indicated that USEC requested six exemptions[50] involving labeling of radioactive material under 10 C.F.R. § 20.1904 (two exemption requests); the 30-day reporting requirement in 10 C.F.R. § 70.50(c)(2); decommissioning funding requirements under 10 C.F.R. §§ 40.36(d) and 70.25(e); criticality monitoring under 10 C.F.R. § 70.24; and the liability insurance requirement under 10 C.F.R. §§ 40.31(*l*) and 70.22(n). For each exemption request, the Staff provided references to the SER where it performed a specific review of USEC's safety

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[48] To address the Board's questions relating to the USEC's exemption requests, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented four witnesses: (1) Dr. Stan Echols; (2) Mr. Timothy C. Johnson, Senior Project Manager, Enrichment and Conversion Branch, FCSS, NMSS; (3) Mr. Michael A. Lamastra, Senior Project Manager (Health Physics), Fuel Manufacturing Branch, FCSS, NMSS; and (4) Dr. Christopher S. Tripp, Senior Nuclear Process Engineer (Criticality), FCSS, NMSS. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTS-4: Exemption Requests (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-4]. USEC presented five witnesses: (1) Mr. Jason E. Bolling, Senior Nuclear Criticality Safety Engineer for the ACP, USEC; (2) Mr. Donald Hatcher; (3) Mr. Peter J. Miner; (4) Mr. Mark D. Smith; and (5) Mr. Timothy D. Taulbee, Radiation Protection Manger for the Portsmouth Gaseous Diffusion Plant, United States Enrichment Corporation. The professional qualifications of each of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Topic HTS-4 (Exemption Requests) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-4].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding exemption requests relative to USEC's License Application.

[49] See February 6 Order at 5-6, 26.

[50] The Board notes that USEC has also applied for approval of an alternate method for addressing the requirements under 10 C.F.R. § 20.601(a), as discussed further in HTS-13 (Radiation Safety). See infra pp. 49-55.

impact analysis, and provided its rationale for granting the request.[51] At the oral hearing, the Board asked clarifying questions regarding the legal and safety criteria used by the Staff in determining whether exemptions should be granted and the general process that the Staff followed in making those determinations.[52]

In accordance with 10 C.F.R. §§ 40.14 and 70.17, an exemption can be granted if it is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest. The Board initially examined the legal authority for granting of exemptions. With respect to the NRC Staff's legal authority for granting exemptions, in the oral hearing, both Staff and USEC counsel argued that, in their judgment, the exemptions at issue here are authorized by law because they are not expressly prohibited by statute or regulation. Although this representation was initially greeted with skepticism by the Board, after reflection, we concluded that this interpretation is proper.[53]

In regard to the second requirement for granting an exemption request – i.e., it will not endanger life or property or the common defense and security and is otherwise in the public interest – the NRC Staff witnesses stated that they reviewed all of the requested exemptions under this criterion, and provided examples of the process they followed in assessing USEC's requests for exemption from regulatory requirements associated with decommissioning financial assurance, criticality alarms in the cylinder yards, cylinder labeling, and time period for

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[51] See NRC Staff WDT/HTS-4 at 3-7.

[52] Tr. at 320-32, 784-97.

[53] See infra pp. 44-45.

reporting events.[54]

After reviewing the NRC Staff's written direct testimony and its answers to our questions posed during the oral hearing, the Board finds that the Staff's review of USEC's exemption requests is consistent with 10 C.F.R. §§ 40.14 and 70.17. Specifically, we find that each of the exemptions is authorized by law and that the Staff's conclusion that these exemptions will not endanger life or property or the common defense and security, and are otherwise in the public interest, is well supported by the record of the proceeding.

The Board has also examined whether these exemptions, taken collectively, will have a negative impact on safety, i.e., will these exemptions in combination interact with each other to produce an adverse impact on plant safety. The NRC Staff provided an explanation that only three exemptions are directly related to plant safety and that all these three exemptions are independent of each other.[55] Based on this, the Board finds the Staff's conclusion – i.e., when taken collectively these exemptions pose no adverse impact on plant safety – is supported by fact and logic.

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[54] Tr. at 324-32.

[55] See NRC Staff WDT/HTS-4 at 8-9; Tr. at 328-31.

HTS-5. USEC's Commitments[56]

A preliminary Board review of the SER and USEC's License Application revealed a number of commitments made by USEC in its License Application. In our February 6 Order, the Board directed the NRC Staff to provide: (1) a list of all USEC's commitments that the Staff considered important to safety; (2) a description of the Staff's plan for monitoring these commitments; and (3) an explanation as to why some apparently significant safety commitments were not elevated to the status of license conditions.[57]

In response to the Board's inquiry, the NRC Staff provided a list of more than 200 USEC commitments the Staff considered important to safety, together with a brief description of, or reference to, the Staff's analyses thereof.[58] With respect to how these commitments will be monitored, the Staff, in its written direct testimony, indicated that all of USEC's commitments must be completed or in place prior to the commencement of plant operations. These commitments will then be reviewed and assessed as a part of the Staff's construction and pre-operational inspection program. After license issuance, compliance will be addressed by the

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[56] To address the Board's questions relating to the USEC's commitments, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Dr. Stan Echols; (2) Mr. Yawar Faraz; and (3) Mr. Jay L. Henson. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTS-5: USEC's Commitments (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-5]. USEC presented one witness, Mr. Peter J. Miner. Mr. Miner's professional qualifications are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Issue HTS-5 (USEC's Commitments) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-5].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding USEC's commitments relative to USEC's License Application.

[57] February 6 Order at 26-27.

[58] See NRC Staff WDT/HTS-5 at 6-28, App. A at 1-7, App. B at 1-4.

Staff's routine inspection program. Finally, the Staff stated that some safety-significant commitments were not elevated to specific license conditions but are incorporated into the license by "tie-down references." In this way, all of USEC's commitments reflected in its licensing documents will, in the judgment of the Staff, be enforceable, thereby making it unnecessary to include all of them as individual license conditions.[59]

At the oral hearing, the Board inquired further into how all of USEC's commitments have been "tied down" so that they will be enforceable, and sought information regarding the implementation schedule for these commitments. The NRC Staff indicated that, even though these commitments had not been explicitly "tied down" (i.e., there is no single document that lists each and every one of these commitments other than the lists submitted as part of the Staff's written direct testimony[60]), they are all enforceable through a catch-all license condition that was proposed after the SER was issued.[61] Although the list of commitments is long, the Staff is confident that it will be able to systematically follow them,[62] and the Board shares that confidence. The Staff reiterated that although there is no detailed implementation schedule, all commitments will be in place before plant operation begins.[63] Based on this, the Board finds the Staff's review of USEC's commitments and its plan for monitoring and enforcing compliance with these commitments is adequate.

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[59] See NRC Staff WDT/HTS-5 at 29.

[60] Id. at 6-28, App. A at 1-7, App. B at 1-4.

[61] See Tr. at 345; see also NRC Staff WDT/HTS-3 at 5-6.

[62] See Tr. at 346-47. 10 C.F.R. § 70.32(k) provides for a pre-operation inspection in which the NRC Staff will address any changes or additions to equipment or procedures and ensure that all tie-down provisions have been satisfied.

[63] See Tr. at 343, 348; NRC Staff WDT/HTS-5 at 29.

HTS-6. Financial Capability To Construct And Operate The ACP[64]

Prior to granting a license of this type, it must be determined "that the applicant appears to be financially qualified to engage in the proposed activities."[65] Accordingly, in our February 6 Order, the Board asked the NRC Staff to: (1) elaborate on how the financial statements made in Chapter 1 of the SER demonstrate USEC's current and continuing access to the financial resources necessary to engage in the proposed activity;[66] (2) discuss the details of the management controls for each of the transition options from the current test program (i.e., the so-called Lead Cascade) to the ACP; and (3) relate each management control to the incremental construction funding and decommissioning costs.[67]

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[64] To address the Board's questions relating to financial capability, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented two witnesses: (1) Mr. Clayton L. Pittiglio, Senior Financial Analysis, Division of Policy and Rulemaking, Office of Nuclear Reactor Regulation (NRR); and (2) Dr. Ronald B. Uleck, Cost Analyst, Division of Policy and Rulemaking, NRR. The professional qualifications of both of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTS-6: Financial Capability (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-6]. USEC presented one witness, Mr. John C. Barpoulis. Mr. Barpoulis' professional qualifications are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Issue HTS-6 (Financial Capability) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-6].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding financial capability relative to USEC's License Application.

[65] 10 C.F.R. § 70.23(a)(5).

[66] SER at 1-6 to 1-9 (following guidance in NUREG-1520 § 1.2.4.3(2), and explaining USEC's approach for financing the construction and operation of the ACP).

[67] February 6 Order at 27.

In its written direct testimony and during the oral hearing, the NRC Staff explained that it reviewed USEC's financial qualifications[68] and, based on USEC's status as a pre-existing, publicly held, global, energy company with total assets of approximately $2 billion, it concluded that USEC appeared financially qualified to build and operate the proposed ACP.[69] In addition, the Staff proposed to impose two license conditions to ensure USEC meets the financial qualification requirements for construction and operation of the ACP.[70]

First, a proposed license condition will require that construction of each incremental phase of the ACP (the scope of each phase to be determined by USEC) shall not begin until funding for that increment is available or committed. More specifically, under this license condition, USEC will be required to have in place commitments for equity contributions from USEC affiliates and/or partners, along with lending arrangements that solely, or cumulatively, will be sufficient to ensure funding for the increment's construction costs before construction starts on that portion of the ACP. In addition, USEC will be required to make available for inspection documentation of both the budgeted costs for that phase and the source of the funds available or committed to pay those costs.[71]

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[68] The NRC Staff's review was performed in accordance with Section 1.2.4.3 of NUREG-1520, in order to ensure compliance with 10 C.F.R. § 70.23(a)(5). See NRC Staff WDT/HTS-6 at 2-3.

[69] See NRC Staff WDT/HTS-6 at 2-4; Tr. at 506-36; see also SER at 1-7. As recently reported to the Securities and Exchange Commission, USEC currently has assets in excess of $1.8 billion, with a net income for 2006 in excess of $100 million. In addition, through the end of 2006, USEC invested more than $370 million in the ACP project, which has been funded by cash from operations. See Tr. at 531-32.

[70] See SER at 1-7.

[71] See id. at 1-7; see also Tr. at 514-22.

Second, a proposed license condition will require that the operation of the ACP shall not begin until USEC has in place either: (1) long-term contracts lasting five years or more that will provide sufficient funding for the estimated cost of operating the facility for the five year period; (2) documentation of the availability of one or more alternative sources of funds that provide sufficient funding for the estimated cost of operating the facility for five years; or (3) some combination of (1) and (2) that will provide sufficient funding to operate the facility for five years.[72]

Based on the NRC Staff's review of USEC's financial condition, as documented in the SER,[73] and as augmented by the written direct testimony and the testimony presented at the oral hearing, the Board is satisfied that the Staff's conclusion that the projected cost estimate[74] is reasonable, and that the record and the Staff's review, coupled with the license conditions that the Staff has proposed, adequately support the Staff's conclusion that the ACP is financially viable and that both the letter and spirit of 10 C.F.R. § 70.23(a)(5) have been satisfied.

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[72] See SER at 1-7.

[73] Id. at 1-6 to 1-7.

[74] See NRC Staff WDT/HTS-6 at 3; Tr. at 522-25.

HTS-7. Decommissioning Funding[75]

In accordance with 10 C.F.R. §§ 40.36 and 70.25, USEC submitted a decommissioning funding plan for the proposed ACP. The Board questioned the NRC Staff, inter alia, on: (1) the essential elements in the contemplated license condition to ensure adequacy of decommissioning funding; (2) specific details of the proposed schedule for funding decommissioning; (3) the schedule for deconverting depleted UF_6 to depleted uranium oxide tails; (4) the rationale for updating the cost estimates for disposal of depleted uranium (DU) once full capacity is reached; (5) various details of the cost basis for DU disposal; and (6) the need for an exemption from requirements to fund all of decommissioning costs at the time of licensing as specified in the regulations.[76] At the oral hearing, the Board asked additional questions to clarify points related to decommissioning, including the time-line for incremental funding, the projected capacity of low-level waste disposal facilities at the time when they will be needed for the ACP, and the effects of a potential lack of capacity on decommissioning costs

[75] To address the Board's questions relating to the decommissioning funding, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Mr. John T. Buckley, Senior Project Manager, Decommissioning and Uranium Recovery Licensing Directorate, Office of Federal and State Materials and Environmental Management Programs; (2) Mr. Craig M. Dean, Project Manager, ICF International; and (3) Mr. Timothy C. Johnson. The professional qualifications Mr. Dean and Mr. Johnson are set out in NRC Staff Exhibit 54. Mr. Buckley's professional qualifications are set in NRC Staff Exhibit 54A. Mr. Buckley did not submit written direct testimony for Hearing Topic HTS-7. See NRC Staff [Written Direct] Testimony Related to HTS-7: Decommissioning Funding (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-7]. USEC presented two witnesses: (1) Mr. John C. Barpoulis; and (2) Mr. Mark D. Smith. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Issue HTS-7 (Decommissioning Funding) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-7].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding decommissioning funding relative to USEC's License Application.

[76] See February 6 Order at 27-30.

for DU disposal.[77]

The steps involved with decommissioning the ACP, which will take an estimated six years to complete, include in order: (1) planning and preparation; (2) process system purging and cleaning; (3) equipment dismantling and removal; (4) decontamination; (5) disposition of equipment and material; (6) disposal of wastes; and (7) completion of a final radiation survey. It is estimated that it will cost approximately $1.35 billion for decontamination and decommissioning of the ACP.[78] The NRC Staff testified that it reviewed USEC's decommissioning funding plan in accordance with regulatory requirements of 10 C.F.R. §§ 40.36 and 70.25 using guidance provided in NUREG–1757, Vol. 3, Consolidated NMSS Decommissioning Guidance – Financial Assurance, Recordkeeping, and Timeliness.[79]

Both NRC Staff and USEC counsel agree that, without an exemption, the controlling regulations – 10 C.F.R. §§ 40.36(d) and 70.25(e) – would require USEC to fully fund all of its estimated decommissioning costs at the time of licensing.[80] USEC, however, has submitted an exemption request to incrementally fund that portion of the decommissioning costs related to the phased installation of centrifuges and generation of DU tails for disposal. If this exemption is approved, USEC will fully fund decontamination and decommissioning costs for the ACP at the time it receives licensed material, except for (1) the removal and decontamination of centrifuges, which will be funded incrementally each January for the projected number of machines that will be installed and brought into operation during that year, and (2) the costs of

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[77] Tr. at 540-587, 797-808.

[78] See SER at 10-3 to 10-5, 10-8.

[79] See NRC Staff Exh. 64 (USEC Decommissioning Funding Exemption).

[80] See Tr. at 804-07.

DU disposition – i.e., deconversion of UF_6 to uranium oxide and the disposal of the DU – which will be based on the projected number of DU cylinders to be generated during the upcoming reassessment period.[81] The Staff concluded that this proposal does not endanger public health and safety, and is otherwise in the public interest.[82] The Staff testified that USEC will be under a continuing obligation to reassess and update its cost estimate to fund its decommissioning financial assurances so that decommissioning can be performed in a manner that is protective of public health and safety, regardless of changes in regulatory requirements for decommissioning, changes in the decommissioning cost estimate, or changes in the licensee's financial condition.[83]

As currently proposed, USEC will initially update its cost estimate annually to reflect the projection of new centrifuges that will be brought into operation during the next year, and the estimate of DU cylinders that will be generated during this period, as well as any other potential cost changes.[84] Once all centrifuges have been installed and the plant is at full capacity (i.e., the 3.5 million Separative Work Units (SWU)[85] per year referenced in the SER), cost estimates will be provided for the generation of DU cylinders on an annual forward looking basis, while

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[81] See SER at 10-13 to 10-14.

[82] See id. at 10-14.

[83] See NRC Staff WDT/HTS-7 at 17.

[84] See id.

[85] SWU is an indirect measure of the energy required to perform isotopic separation of uranium as calculated by a standard formula. For example, if you begin with 100 kilograms of natural uranium, it would take about 60 SWU to produce 10 kilograms of uranium enriched to 4.5 percent U-235. It takes approximately 100,000 SWU of enriched uranium to fuel a typical 1,000 megawatt commercial nuclear reactor which, in turn could supply the electricity needs for a city of about 600,000 people for one year. See FEIS at 2-5.

funding estimates for the remainder of decontamination and decommissioning will be updated at least every three years.[86] To handle unexpected costs, the NRC requires a 25 percent contingency factor on decommissioning cost estimates as recommended in NUREG- 1757, which would provide for unforeseen events that may happen during operations or decommissioning that could increase the overall costs of this activity.[87]

USEC proposes to use a surety bond as the instrument to ensure sufficient funding at a level matching the updated decommissioning cost estimates. Under its proposal, six months before receipt of licensed material, USEC will be required to submit an updated cost estimate for decommissioning, and to submit a corresponding financial assurance instrument. USEC will not be allowed to receive licensed material at the ACP until the instrument has been reviewed and approved by the NRC Staff, and the final funding mechanism at the level of the updated cost estimate has been implemented.[88] As proposed, if USEC changes the funding mechanism during operations – i.e., to something other than a surety bond – it will have to submit the final language of the new mechanism to the NRC at least six months prior to the date on which the funding mechanism would be changed. This will allow adequate time for the Staff to review it in order to ensure that the new financial mechanism satisfies the regulations.[89]

Under its proposal, USEC will not provide for decommissioning funding prior to the receipt of fissionable material. The NRC Staff believes this is reasonable because the NRC does not regulate the decommissioning of the facility until there is a potential for it to be

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[86] See NRC Staff Exh. 64; Tr. at 546.

[87] See Tr. at 558.

[88] See NRC Staff WDT/HTS-7 at 4-5.

[89] See Tr. at 553-54.

contaminated with licensed radiologic material that is brought to the site.[90]

As a plausible DU disposal strategy, USEC proposed to transfer the DU it generates to DOE for disposition. USEC's cost estimate is currently based on deconversion of UF_6 to uranium oxide at a plant presently being constructed by DOE at the Portsmouth facility, and for DU disposal at EnergySolutions' low-level waste facility (formerly Envirocare of Utah) near Clive, Utah.[91] The purpose of DOE's new deconversion plant at the Portsmouth facility is to handle its current inventory of DU, as well as to process future generations of DU, including from the ACP. As derived by USEC, the deconversion cost for the ACP is based on a calculation that uses a cost estimating approach provided by DOE, but updated to reflect: (1) the volume of DU to be generated at the ACP; (2) changes from 2004 to 2006 dollars; and (3) the 25 percent contingency factor. The costs for DU disposal were based on quantity estimates calculated by USEC (and confirmed by the NRC Staff) and unit disposal costs obtained from EnergySolutions.[92] The costs for the disposal of DU tails differ between the SER and the FEIS. The number in the SER is the most recent estimate because it was published after the FEIS. As explained further under HTE-2 (Impacts of DU Disposal),[93] the differences in these cost estimates is small and does not affect the conclusions contained in the FEIS.[94]

Although the sequencing of processing ACP tails with existing DOE tails is not defined at this time, the NRC Staff testified that, in its judgment, it is reasonable to assume that all or

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[90] See id. at 545, 548.

[91] See id. at 576; NRC Staff WDT/HTS-7 at 13-14.

[92] See NRC Staff WDT/HTS-7 at 9, 12-13.

[93] See infra pp. 59-63.

[94] See NRC Staff WDT/HTS-7 at 13.

some of the ACP tails may not reach the EnergySolutions' facility for twenty years or more.[95] While the Staff testified that it would be difficult to judge EnergySolutions' available disposal capacity for DU that far in the future, the Staff indicated that it felt reasonably certain that space would be available given the low volume of ACP DU compared to the currently available disposal capacity.[96] We agree, and find that the Staff's conclusion is well supported by the record of this proceeding.

In regard to the incremental funding, the Board questioned whether each year's estimated value included the amount of material remaining in the centrifuges at the end of the year.[97] The NRC Staff testified that each machine contains only "gram quantities of material."[98] Therefore, when the plant is at full capacity, the total quantity of residual material in the machines and associated piping will amount to about one ton of uranium that will need to be disposed of when the plant shuts down. Although the disposal cost for the residual tails has not been allocated to the cost funding estimates, the Staff testified the small expense could easily be handled by the contingency factor.[99] While the Board notes that the contingency factor is intended for unknown costs, we find that the expense for such a small quantity of DU is negligible. As a final point, the Staff testified that USEC's License Application is based on current NRC regulations, but that any changes in the regulations that could ultimately affect

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[95] Tr. at 579-80.

[96] Id. at 584; see also infra pp. 59-63 (HTE-2 (Impacts of DU Disposal)).

[97] See Tr. at 568.

[98] Id.

[99] Id. at 572-73.

decommissioning will be applicable to USEC and the ACP.[100]

Based on the NRC Staff's and USEC's testimony, the Board finds that USEC has submitted a decommissioning funding plan for the proposed ACP that complies with 10 C.F.R. §§ 40.36(d) and 70.25(e). We find that the Staff's review of the funding basis for this plan has been adequate. We further find that the funding required for the most costly component – disposition of DU tails – is predicated on transferring DU to DOE, which is a plausible strategy allowed by statute.[101] The cost estimate for this proposal comprises (1) deconversion cost estimates adapted by USEC for DOE's Portsmouth deconversion facility presently under construction, and (2) disposal cost estimates based on EnergySolutions' unit quotes applied to the process flow rates stated by USEC in its License Application. The Board finds that these cost analyses by the Staff are sound, and that the funding mechanism proposed by USEC, i.e., a surety bond, meets the regulation.

The Board finds that the exemption allowing incremental funding for the phased installation of operational centrifuges and generation of DU tails is authorized by law (i.e., not prohibited).[102] Moreover, it does not otherwise endanger public health and safety nor is it against the public interest, because sufficient decommissioning funding under this proposal will be in place before the centrifuges are contaminated with uranium and before DU is generated. In addition to finding that the Staff's conclusion regarding the cost basis is reasonable, we find that the schedule for updating these estimates and the level of funding assurance demonstrate

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[100] Id. at 585.

[101] See Louisiana Energy Servs., L.P. (National Enrichment Facility), CLI-06-22, 64 NRC 37, 39 & n.8 (2006).

[102] See infra at 44-45.

that any modification to disposal costs may be properly addressed in the decommissioning funding. As a result, we find the Staff's review is reasonable and appropriate.

The Board also concurs with the NRC Staff and USEC that any changes in regulations affecting decommissioning requirements that may impact the cost estimates are not grandfathered for the ACP and must be incorporated, as relevant, into annual updates.

HTS-8. Accident Analyses[103]

A. Completeness And Reasonable Assurance

As indicated in the SER, the NRC Staff performed an independent confirmatory analysis of USEC's evaluation of credible accidents that was contained in USEC's ISA.[104] The Board first questioned the Staff as to whether the list of credible accident sequences proposed by USEC was reasonably complete, and whether there are any credible accident sequences that

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[103] To address the Board's questions relating to accident analyses, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented six witnesses: (1) Dr. Stan Echols; (2) Mr. Michael A. Lamastra; (3) Ms. Norma Garcia Santos, Chemical Engineer, Enrichment and Conversion Branch, FCSS, NMSS; (4) Dr. Christopher S. Tripp; (5) Mr. William Troskoski, Senior Chemical Safety Technical Reviewer, FCSS, NMSS; and (6) Mr. Rex G. Wescott, Senior Fire Protection Engineer, FCSS, NMSS. The professional qualifications Dr. Echols, Mr. Lamastra, Ms. Santos, Dr. Tripp, and Mr. Wescott are set out in NRC Staff Exhibit 54. Mr. Troskoski's professional qualifications are set in NRC Staff Exhibit 54A. Mr. Lamastra did not submit written direct testimony for Hearing Topic HTS-8. See NRC Staff [Written Direct] Testimony Related to HTS-8: Accident Analysis (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTS-8]. USEC presented four witnesses: (1) Mr. Jason E. Bolling; (2) Mr. Gregory S. Corzine; (3) Mr. Peter J. Miner; and (4) Mr. Gene L. Pyzik, Senior Safety Analyst, WSMS Mid-America, LLC. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Topic HTS-8 (Accident Analysis) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-8].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding accident analyses relative to USEC's License Application.

[104] SER Ch. 3, App. A.

were not considered by USEC but should have been.[105] In its written direct testimony, and in testimony during the oral hearing, the Staff indicated it has reasonable assurance that USEC's ISA is complete, and that, in its judgment, there are no additional credible accident sequences USEC should have, but did not, consider.[106]

The Staff's conclusion was based on "horizontal slice" and "vertical slice" reviews conducted during four on-site Staff reviews, which are described in Chapter 3 and Appendix A of the SER.[107] The "horizontal slice" reviews were in the areas of ISA methods, chemical safety, fire safety, radiation protection, criticality safety, structural and geotechnical design, instrumentation and control, and human errors. ISA procedures such as screening of accident sequences, development of accident likelihood estimates, and development of management measures for selected accident sequences were also evaluated.[108] The "vertical slice" reviews were made on selected accident sequences to determine the adequacy of the IROFS and defense-in-depth control strategies.[109] The Staff documented these reviews in Chapter 3 and Appendix A of the SER. Additional details of the ISA review are also contained in the remaining SER chapters and appendices.[110]

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[105] See February 6 Order at 6-8, 30-32.

[106] See NRC Staff WDT/HTS-8 at 3; Tr. at 365-70.

[107] SER Ch. 3, App. A at A-31 to A-36; see also NRC Staff WDT/HTS-8 at 2-3; Tr. at 479-82.

[108] See NRC Staff WDT/HTS-8 at 3.

[109] See id.

[110] See id. at 2-3.

The NRC Staff indicated that during the course of its review, USEC added to its ISA – at the request of the Staff – accident sequences including several related to nuclear criticality.[111] The Staff pointed out that USEC included this additional information in its License Application and ISA Summary for the ACP.[112] Table A-1 of the SER sets out the IROFS and initial conditions that were modified as a result of the Staff's interaction with USEC.[113]

The Board also heard testimony during the oral hearing from USEC and the NRC Staff regarding the meaning of the terms "reasonable assurance" and "completeness," as they were used by USEC in its ISA and the Staff in the SER. USEC, in response to a Board question, indicated that while there is no absolute guarantee, it believes its thorough safety evaluation and analysis provides reasonable assurance.[114]

The Board finds that the Staff's conclusion that USEC provided reasonable assurance that its ISA is complete, and that there are no credible accident sequences that USEC should have considered, but did not, was based on an adequate Staff review and is supported by the record of this proceeding.

B. Selected Accident Sequences

The Board inquired into specific areas of accident analyses in the Staff's review of the ISA relating to the likelihood of occurrence of credible high-consequence events and credible intermediate-consequence events as defined in 10 C.F.R. § 70.61(b), and (c), how these

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[111] See SER at A-18; NRC Staff WDT/HTS-8 at 3.

[112] See SER at A-24; see also USEC Exh. 2 (License Application for the ACP); USEC Exh. 9 (ISA Summary for the ACP).

[113] SER at A-25 to A-27.

[114] Tr. at 495-98.

accidents may progress, and their associated mitigation measures.[115]

In its written direct testimony and in its oral testimony during the hearing, the NRC Staff provided an overview of how it conducted its accident analysis review, specifically providing a discussion on three postulated accident sequences: (1) FB 3-3, **xxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxx**; (2) BT3-4, **xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**; and (3) WS3-12, **xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxx**.[116] These selected accident sequences, the Staff asserted, were determined by USEC to have a likelihood of occurrence in the "not unlikely" category.[117] The first two accident sequences, FB3-3 and BT3-4, are considered credible high-consequence events, while the third accident sequence, WS3-12, is considered a credible intermediate-consequence event.[118] This discussion of accident sequences provided adequate insight into the Staff's approach and method in its accident analysis.

The Board finds that the Staff's response to the Board inquiry demonstrated that the breadth and depth of the Staff's review of the ISA regarding accident analyses was adequate.

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[115] See February 6 Order at 30-31.

[116] See NRC Staff WDT/HTS-8 at 3-21; Tr. at 437-46.

[117] NRC Staff WDT/HTS-8 at 5.

[118] See id. at 6, 7, 9.

C. NUREG-1520 Definitions Of Likelihood

In response to Board inquiry, the NRC Staff described the rationale in NUREG-1520 for selecting definitions of "highly unlikely" and "unlikely" for ensuring compliance with the performance requirements in 10 C.F.R. § 70.61(b), (c).[119] The focus of the Board's inquiry was to determine whether these definitions of "likelihood" were selected in an arbitrary fashion. The Board finds that the Staff's reliance on the NUREG-1520 rationale for selecting a definition of "highly unlikely" as less than 10^{-5} per year and the definition of "unlikely" as between 10^{-4} and 10^{-5} per year, is reasonable, based on the testimony presented by the Staff.[120]

D. Criticality Accidents For Up To Ten Percent Enrichment

Finally, the Board inquired into the NRC Staff's expectation that there will be no significant impact on the consequences of a generic criticality accident in changing from 4 percent[121] to 10 percent enrichment.[122] The Staff indicated in its written direct testimony and in response to Board questions at the oral hearing that, according to historical experience documented in LA-13638,[123] there is essentially no correlation between the enrichment level and the amount of energy released.[124] LA-13638 describes twenty-two process criticality accidents between 1953 and 1999 involving uranium systems (with enrichment between 6.5

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[119] NUREG-1520 at 3-27; NRC Staff WDT/HTS-8 at 11-12.

[120] See Tr. at 400; NRC Staff WDT/HTS-8 at 11.

[121] The 4 percent enrichment level was used as the basis for the generic criticality accident analysis previously developed in NUREG/CR-6410, Nuclear Fuel Cycle Facility Accident Analysis Handbook (see NRC Staff Exh. 25).

[122] See February 6 Order at 31.

[123] NRC Staff Exh. 22 (LA-13638, A Review of Criticality Accidents (2000 Version).

[124] See NRC Staff WDT/HTS-8 at 12; Tr. at 401-05.

percent and 93 percent U-235) and plutonium systems. The Staff stated that while the likelihood of criticality would be greater at higher enrichment, historical data indicated the consequences would not necessarily be worse.[125]

Additionally, to specifically demonstrate that there is no significant difference between consequences at 4 percent, 5 percent, and 10 percent enrichment levels, the NRC Staff contracted with Oak Ridge National Laboratory (ORNL) to perform an analysis,[126] which confirmed that there is no significant difference between consequences up to 10 percent enrichment in the generic criticality accidents evaluated by the Staff.[127]

In conclusion, the Board finds the NRC Staff has adequately reviewed USEC's ISA, and has properly performed an independent confirmatory analysis of USEC's evaluation of credible accidents. The Board also finds that the Staff's review is of adequate breadth and depth. Finally, the Board finds that the Staff's conclusion that USEC's ISA is reasonably complete, is supported by logic and fact, and is supported by the record of this proceeding.

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[125] See NRC Staff WDT/HTS-8 at 12-13.

[126] NRC Staff Exh. 24 (ORNL, Estimated Production of Select Fission Products During a Criticality Accident (Sept. 13, 2005)); NRC Staff Exh. 25 (NUREG/CR-6410).

[127] See Tr. at 401-05.

HTS-9/HTE-3. Environmental Monitoring[128]

USEC's environmental monitoring program was developed to provide measures needed to protect the environment and the health and safety of the public as required by 10 C.F.R. Parts 20, 30, 40, 51, and 70. The NRC Staff provided a detailed description of USEC's monitoring program in Chapter 9 of the SER, and reviewed the adequacy of USEC's plan in accordance with the acceptance criteria contained in Section 9.4.3.2 of NUREG-1520.

As recommended in NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs, environmental monitoring was also addressed by the NRC Staff in its FEIS as part of its environmental measurements and monitoring program review.[129] USEC's activities are proposed to meet, in part, the intent of the Council on Environmental Quality (CEQ) regulations, which require a monitoring and enforcement program

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[128] To address the Board's questions relating to environmental monitoring, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented six witnesses: (1) Mr. Matthew D. Blevins, Senior Project Manager, Environmental and Performance Assessment Branch, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs; (2) Dr. Stan Echols; (3) Mr. Donald T. Hammer, Principal, ICF International; (4) Mr. Michael A. Lamastra; (5) Mr. Todd E. Stribley, Senior Associate, ICF International; (6) Dr. Raymond P. Wood, President, Trinity Engineering Associates, Inc. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. Mr. Lamastra and Dr. Wood did not submit written direct testimony for Hearing Topic HTS-9/HTE-3. See NRC Staff [Written Direct] Testimony Related to HTE-3/HTS-9: Environmental Monitoring (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTE-3/HTS-9]. USEC presented three witnesses: (1) Mr. Greg E. Fout, Environmental, Safety, and Health Coordinator for the ACP, USEC; (2) Mr. Peter J. Miner; and (3) Mr. Daniel A. Towne. The professional qualifications of each of the USEC witnesses are set out in USEC Exhibit 1. Mr. Towne did not submit written direct testimony for Hearing Topic HTS-9/HTE-3. See [USEC's Written Direct] Testimony Concerning Environmental Monitoring Issues (Mar. 12, 2007) [hereinafter USEC WDT/Environmental Monitoring].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding environmental monitoring relative to USEC's License Application.

[129] See NUREG-1748 at 5-25 to 5-30; FEIS at 6-1 to 6-12.

as part of the practicable means to avoid or minimize environmental harm from the selected alternative.[130]

The Staff described in Section 9.3.2.4 of the SER and Chapter 6 of the FEIS how USEC will directly measure radiological and physiochemical gaseous and liquid effluents from its material handling and process buildings, and potential sources of radioactivity discharges to surface water. In addition, the Staff noted that USEC has proposed a radiological environmental measurement and monitoring program for potential receptors in the vicinity of the proposed ACP, including surface water, sediments, soils, vegetation, biota, wildlife, and crops.[131] The Staff determined that USEC prepared its radiological monitoring program for air and liquid effluents in accordance with the applicable regulatory guidelines, and that approved dispersion models will be used with air emissions and meteorological data to calculate the resulting environmental impacts.[132]

The Board questioned the NRC Staff regarding selected environmental monitoring issues. These included (1) the need and extent of groundwater monitoring and baseline data to ensure releases from the ACP could be separated from historic impacts, and (2) the extent that the Machine Cooling Water (MCW) and Liquid Effluent Control (LEC) systems might be a source of inadvertent radiological releases.[133]

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[130] 40 C.F.R. § 1505.2(c).

[131] See FEIS at 6-2 (Table 6-2).

[132] See FEIS at 6-5; see also RG 4.15, Quality Assurance for Radiological Monitoring Programs; RG 4.16, Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants.

[133] See February 6 Order at 17-18; 34-37; see also Tr. at 622-63.

In regard to the first issue, USEC does not propose to perform any groundwater monitoring as part of its regular program, in part because the existing wells are being monitored by DOE as part of its Resource Conservation and Recovery Act (RCRA)[134] corrective action program.[135] The chances for an inadvertent release of radioactivity to the groundwater from the ACP are very unlikely because, as USEC testified, there is no real source that could release radioactivity to groundwater. Excluding the sewer and storm water lines, USEC testified that there are no buried pipelines or tanks that could potentially contain radionuclides associated with the ACP besides tanks and piping of the LEC system.[136] The Staff testified that wells are available around the ACP and as a backup, could be used as a quantification tool if events at the facility suggest the need to investigate potential inadvertent releases of radioactivity to groundwater.[137] To determine potential impacts from the ACP, baseline conditions in the groundwater have been defined as part of DOE's ongoing RCRA monitoring program.[138]

As to the second issue, the Board questioned the NRC Staff on the details of the MCW and LEC systems to ensure they are not potential sources of inadvertent releases of radioactivity to the environment. As summarized in HTE-5 (Liquid Effluent Control System),[139] the Board finds that the Staff's conclusion that the chances for radiological release to the environment from these systems are minimal is reasonable and adequately supported by the

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[134] 42 U.S.C. § 6901-6908a (2000).

[135] See Tr. at 651; see also FEIS at 6-9.

[136] Tr. at 661.

[137] Id. at 655-56.

[138] FEIS at 6-9; see also Tr. at 646-47.

[139] See infra pp. 67-69.

record of this proceeding. In addition, liquids that may contain radioactivity from the process buildings will be collected by the LEC system, sampled, and discharged in a manner appropriate to its quality.[140]

The Board evaluated the NRC Staff's review of environmental monitoring from both a safety and environmental perspective. Based on its review of the environmental monitoring program, the Board finds that the Staff has adequately reviewed USEC's plan in accordance with the provisions of NUREG-1520 and NUREG-1748, and has an adequate basis to conclude the proposed measures ensure protection of the environment and the health and safety of the public as required by 10 C.F.R. Parts 20, 30, 40, 51, and 70. Given the low levels of effluents expected from the ACP, and the small potential increment that the ACP will contribute to the existing impacts from the Gaseous Diffusion Plant (GDP) at Portsmouth, the Board finds that the Staff's conclusion that USEC's environmental monitoring program and its proposal to use effluent monitoring and modeling to demonstrate compliance with the regulations to be acceptable and consistent with Section 9.4.3.2.2(2) of NUREG-1520 and the applicable regulations.

As an environmental issue, the Board finds that the monitoring program was prepared in accordance with NUREG-1748 and meets the intent of the CEQ regulations[141] for a monitoring program as part of the practicable means to avoid or minimize environmental harm from the proposed action. Although USEC does not propose any groundwater monitoring, the Board finds that it is clear from the testimony that the likelihood of inadvertent radiological releases from the ACP would be very small, and that groundwater monitoring is already being done by

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[140] See id.

[141] 40 C.F.R. § 1505.2(c).

DOE. Groundwater monitoring wells exist around the ACP buildings for use in implementing a remedial investigation if conditions at the plant warrant such activity.

HTS-10. Enrichment Process[142]

As noted in the SER, the NRC Staff reviewed a 3.5 million SWU per year plant with a maximum of 10 percent enrichment, which is based on the description of the facility contained in USEC's License Application.[143] The Staff further noted that it will evaluate any increase in capacity that USEC may request through the change process identified in 10 C.F.R. § 70.72. The Board directed the Staff to describe the process by which it will review any planned increase in capacity[144] and to explain how, if at all, the public will be allowed to participate in that review.[145]

The NRC Staff witnesses explained that in order to increase the capacity of the ACP, USEC will undoubtedly be required to submit a license amendment pursuant to 10 C.F.R. §

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[142] To address the Board's questions relating to the enrichment process, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Dr. Stan Echols; (2) Mr. Brian W. Smith; and (3) Dr. Christopher S. Tripp. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. Mr. Smith did not submit written direct testimony for Hearing Topic HTS-10. See NRC Staff [Written Direct] Testimony Related to HTS-10: Enrichment Process (Mar. 16, 2007) [hereinafter NRC Staff WDT/HTS-10]. USEC presented four witnesses: (1) Mr. Jason E. Bolling; (2) Mr. Gregory S. Corzine; (3) Mr. Greg E. Fout; (4) Mr. Peter J. Miner. The professional qualifications of each of the USEC witnesses are set out in USEC Exhibit 1. USEC did not submit any written direct testimony for HTS-10.

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding the enrichment process relative to USEC's License Application.

[143] SER at 1-1.

[144] The FEIS was prepared on the assumption that the ACP facility would be expanded to 7 million SWU per year. See FEIS at 2-5.

[145] See March 2 Order at 1.

70.72(c), and (d). Initially, the Board was advised by the Staff that the possession limits of SNM specified in the proposed license will need to be increased to accommodate any significantly increased capacity, and such an increase will require a license amendment. Likewise, we were advised that if the proposed increase would create the potential for new types of accident sequences, alter or create a IROFS, or utilize new technologies USEC was not familiar with, a license amendment pursuant to section 70.72(d) would be necessary.[146] In addition, the Board was assured by the Staff that even if USEC erroneously concluded a license amendment was not necessary, the NRC will have adequate notice of any increase in capacity because of the incremental funding provisions of the proposed license among others. The Staff assured the Board that the NRC could require USEC to submit a license amendment, if appropriate.[147] If a license amendment is required, public participation in this licensing process will be controlled by the rules relevant to license amendments. The regulations do not provide additional opportunities for public input for minor changes or modifications not requiring a license amendment, as described in 10 C.F.R. § 70.72.

Another matter on which the Board sought clarification at the oral hearing was a proposed license condition that would require USEC to provide sixty days notice to the NRC before modifying its procedures to accomplish enrichment exceeding 5 percent U-235. The purpose of this license condition is to provide the NRC Staff with time to verify that processes will be conducted safely.[148] Specifically, we asked the Staff to discuss the depth of the safety review for 10 percent enrichment conducted in preparing the SER, and to: (1) summarize what

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[146] See Tr. at 232-33, 235-36.

[147] See id. at 242, 231-32, 258-59.

[148] See SER at 1-10.

additional analyses will be performed in the sixty-day period allocated by the proposed license condition, and (2) explain why all the processes with 10 percent enrichment were not reviewed for the SER.[149]

The Board was advised by the NRC Staff that the ISA assumed that the plant will be operating at a maximum of 10 percent enrichment and, accordingly, all IROFS and necessary safety controls were defined in USEC's ISA Summary based on the 10 percent assumption. We were further assured that all fissile material operations were analyzed for up to 10 percent and that all IROFS and double contingency controls have been imposed on 10 percent enrichment operations. In summary, we were advised that safety analyses had been prepared as if the facility were to operate at 10 percent enrichment, and the proposed license condition providing for sixty days notification prior to increasing above 5 percent enrichment will be sufficient time for the Staff to identify any substantial health or safety concerns and take appropriate action.[150]

The Board finds that, although USEC has not yet developed all the relevant design aspects for the ACP that will be necessary to increase enrichment above 5 percent, the prevailing Staff view that USEC's License Application is in accordance with NUREG-1520 and 10 C.F.R. § 70.22(a) is reasonable, is supported by fact and logic, and provides adequate assurance of protection of the public health and safety.

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[149] See March 2 Order at 1.

[150] See Tr. at 259, 263-64, 268-71.

HTS-11. Exemption Request For Liability Insurance[151]

Pursuant to 10 C.F.R. §§ 40.31(*l*) and 70.22(n), a license application that seeks authorization to use source material or SNM in an uranium enrichment facility must include the applicant's provisions for liability insurance. Specific liability insurance requirements for uranium enrichment facilities are specified at 10 C.F.R. § 140.13b, which further provides that proof of adequate liability insurance must be filed with the NRC, as required by 10 C.F.R. § 140.15, before a license for the operation of an uranium enrichment facility may be issued. USEC has not provided proof of liability insurance in its License Application, rather, it has sought an exemption from this requirement pursuant to 10 C.F.R. §§ 40.14 and 70.17.[152]

The NRC may grant USEC's request if it finds that the proposed exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.[153] The NRC Staff has concluded that USEC's request meets the requirements of the regulations, and has determined that the requested exemption should be granted. As discussed below, the Board finds the Staff's conclusions are reasonable and well supported by the record of this proceeding.

The NRC Staff concluded that the ACP, which is to be constructed on land leased by USEC from DOE, has been determined by American Nuclear Insurers to be ineligible for insurance that fully covers operation of the ACP on this existing DOE site because the site is

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[151] Counsel for the NRC Staff and USEC addressed the Board's questions relating to USEC's exemption request for liability insurance. See NRC Staff Response to Board's Additional Hearing Questions and Topics at 1-3 (Mar. 16, 2007) [hereinafter NRC Staff March 16 Brief]; USEC Inc. Brief on Licensing Board Hearing Topics Related to Liability Insurance and the DOE Indemnity (Mar. 15, 2007) [hereinafter USEC March 15 Brief].

[152] See SER at 1-8, 1-13.

[153] See 10 C.F.R. §§ 40.14 and 70.17.

not a new "clean" site.[154] The Staff noted however, that the lease agreement between USEC and DOE[155] provides that DOE will, as authorized by the Price-Anderson Act,[156] indemnify USEC against claims arising from nuclear incidents to the extent that USEC cannot obtain commercial insurance at reasonable rates.[157] Because the purpose of requiring USEC to obtain liability insurance will be fully satisfied by reason of DOE's indemnification of USEC, the Staff concluded that granting the requested exemption was in the public interest.[158]

The Board finds this decision by the NRC Staff to be well supported by the record and based in logic and fact. However, we questioned the Staff's conclusion that this exemption was "authorized by law."[159] In response to this legal issue, Staff counsel represented that, because DOE had legal authority to indemnify USEC against claims arising from nuclear incidents, the exemption under the Commissions' regulations (10 C.F.R. §§ 40.14 and 70.17) was authorized by law.[160] Yet, the fact that DOE is authorized by law to indemnify USEC against claims arising from nuclear incidents is not logically dispositive of whether we are authorized by law to grant

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[154] NRC Staff March 16 Brief at 2.

[155] NRC Staff Exh. 5 (Supplemental Agreement No. 1 and Appendix 1 of the Lease Agreement Related to the ACP (Jan. 17, 2007)).

[156] AEA § 170, 42 U.S.C. § 2210.

[157] The limit of liability established by the Price-Anderson Act is $10 billion (42 U.S.C. § 2210(d)(2)(B)), which is in excess of the liability insurance required under NRC regulations. Cf. 10 C.F.R. § 140.13b; see also NUREG/BR-0164 at 9. In addition, if insurance at any coverage level becomes commercially available, USEC will be required, pursuant to the proposed license condition, to secure such insurance to the extent that it is available.

[158] See SER at 1-8, 1-13.

[159] See Tr. at 785.

[160] See NRC Staff March 16 Brief at 2.

exemptions under NRC regulations. Accordingly, the Board rejects that argument.

For its part, USEC argued that the requested exemption was "authorized by law" because there is no legal prohibition against granting the exemption.[161] Although the Board originally viewed this argument with skepticism (i.e., questioning whether "authorized by law" and "not expressly prohibited" are logically synonymous), we now accept it. Specifically, the Board concludes that we must infer that the proposed exemption is implicitly "authorized by law" if all of the conditions listed therein are met (i.e., will not endanger life or property or the common defense and security, and is otherwise in the public interest) and no other provision prohibits, or otherwise restricts, its application. To do otherwise would render these two exemption provisions meaningless, which violates elementary rules of construction that the language of a regulation should not be read to destroy itself[162] and a provision should not be read in a way that is inconsistent with its purpose.[163] In addition, it appears that the NRC has traditionally read the language "authorized by law" to be the functional equivalent of "not prohibited by law."[164] Accordingly, the Board concludes that these exemptions are authorized by law.

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[161] See USEC March 15 Brief at 3.

[162] See Citizens Bank of Maryland v. Strumpf, 516 U.S. 16, 20 (1995).

[163] See Eli Lilly & Co. v. Medtronic, Inc., 496 U.S. 661, 668-69 (1990); Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Found., Inc., 484 U.S. 49, 59 (1987).

[164] See Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), DD-90-8, 32 NRC 469, 488 (1990); Cleveland Elec. Illuminating Co. (Perry Nuclear Power Plant, Units 1 and 2), ALAB-841, 24 NRC 64, 99 (1986); Tennessee Valley Authority (Clinch River Breeder Reactor Plant), CLI-82-83, 16 NRC 412, 422-25 (1982); Washington Pub. Power Supply System (WPPSS Nuclear Project Nos. 3 and 5), CLI-77-11, 5 NRC 719, 722 (1977).

HTS-12. ISA And ISA Summary: Sufficiency Of Review Information[165]

The Board reviewed the level of detail utilized by the NRC Staff in its assessment of safety aspects relating to the ACP, with emphasis on the impact from a potential increase above 5 percent enrichment. This was done to examine the logical and factual support for the Staff's conclusion that there are reasonable assurances that no unresolved safety issues remain, and that the Staff has a procedure in place before operations commence to address any unanticipated safety conditions that might become evident after the license is granted.[166] The Staff stated that the prevailing Staff view is that there is reasonable assurance that all credible accident sequences have been identified through the use of the Preliminary Hazard Analysis procedure laid out in NUREG-1513, Integrated Safety Analysis Guidance Document. The Staff further advised the Board that "horizontal reviews" were performed by Staff members using their specialized expertise, knowledge of the processes, and experience with similar facilities, and that this process resulted in the identification of other possible accident

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[165] To address the Board's questions relating to the ISA and ISA Summary, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented five witnesses: (1) Mr. Jay L. Henson; (2) Mr. Timothy C. Johnson; (3) Mr. Brian W. Smith; (4) Mr. William Troskoski; and (5) Mr. Rex G. Wescott. The professional qualifications of Mr. Henson, Mr. Johnson, Mr. Smith and Mr. Wescott are set out in NRC Staff Exhibit 54. Mr. Troskoski's professional qualifications are set out in NRC Staff Exhibit 54A. Mr. Troskoski did not submit written direct testimony for Hearing Topic HTS-12. See NRC Staff [Written Direct] Testimony Related to HTS-12: ISA and ISA Summary of Review Information (S2-1) (Mar. 16, 2007) [hereinafter NRC Staff WDT/HTS-12]. USEC presented two witnesses: (1) Mr. Robert M. Bernero, Independent Nuclear Safety Consultant for USEC; and (2) Mr. Peter J. Miner. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Issue HTS-12 (ISA and ISA Summary: Sufficiency of Review of Information) (Mar. 12, 2007) [hereinafter USEC WDT/HTS-12].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding the ISA and ISA Summary relative to USEC's License Application.

[166] See March 2 Order at 2-4.

sequences that it then required USEC to analyze. The Staff illustrated the steps it used to catagorize the likelihood of an event, analyze an event, quantify the likely frequency of the event, and identify actions to mitigate the consequences of an event.[167]

The NRC Staff noted, however, that there are several NRC Staff employees who believe that there was not a sufficient level of review of the ACP Application.[168] The Board's inquiries into the Differing Professional Opinion (DPO)[169] submitted by these employees and findings relating to the DPO Process are discussed below.

As previously discussed in HTS-10 (Enrichment Process),[170] the NRC Staff advised the Board that, in regard to enrichments greater than 5 percent, the ISA was based on the plant operating at 10 percent enrichment. USEC confirmed that all IROFS and necessary safety controls have been identified in its ISA Summary for the plant operating at 10 percent enrichment.[171] The Staff agreed with this representation by USEC, assured the Board that all fissile material operations were analyzed for up to 10 percent enrichment, and verified that all IROFS and double contingency controls have been imposed on 10 percent enrichment operations.[172]

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[167] See Tr. at 366-86.

[168] See id. at 367-68.

[169] NRC Staff Exh. 62 (Differing Professional Opinion (Nov. 15, 2006)); Supplement to NRC Staff February 20 Response (Feb. 26, 2007) (Response of Four NRC Staff Members to Question Pertaining to Sufficiency of Review Information).

[170] See supra pp. 40-42.

[171] See Tr. at 259.

[172] See NRC Staff WDT/HTS-10 at 3; Tr. at 264.

The NRC Staff stated during the oral hearing[173] that there will be only limited situations that could lead to criticality at the ACP, even at 10 percent enrichment, due to the lack of a moderator with the dry system proposed for the facility, and unfavorable geometry for criticality with the equipment for most of the processes. In the Staff's judgment, criticality could only occur if there was a major breach in a large product cylinder of enriched uranium (e.g. 10-ton cylinders) with water sprayed directly into the breach. This sequence of events would be highly unlikely and, if it did occur, the lethal radius of impact would be a very localized event, i.e., limited to about 15 feet around the breached cylinder.

As noted above, several employees filed a formal DPO regarding the level of information needed for 10 C.F.R. Part 70 licensing review. The Board inquired regarding the procedures associated with the DPO Process. Specifically, it questioned whether there is justification for delaying the issuance of the SER until the completion of the DPO Process, and how the licensing process may be impacted if the DPO is resolved in favor of the DPO submitters.[174]

In its written response to the Board's March 2 Order, and in answering Board questions during the oral hearing, NRC Staff counsel indicated that, while the DPO filing requires an agency review, the DPO does not supersede or subvert the discretionary authority of the agency and that the DPO program does not preclude the agency from conducting licensing reviews or making licensing decisions. The function of the DPO program, counsel further asserted, is to provide a mechanism for an individual NRC Staff member to raise views differing from those prevailing in the agency, and not to supersede the ordinary decision-making process

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[173] Tr. at 441-44.

[174] See March 2 Order at 2.

of the agency.[175] The Board finds this explanation adequate and sees no reason to delay our decision until the DPO process has been completed.

Finally, the NRC Staff stated that in the event the DPO is resolved in favor of the DPO submitters, the Staff at that time will determine whether it needs to modify the SER to be consistent with the revised agency position. The Staff indicated that this potential change in agency policy would be no different from any other instance outside of the DPO process.[176] The Board finds this explanation credible.

HTS-13. Radiation Safety[177]

Regulatory requirements applicable to Radiation Protection (RP) are presented in 10 C.F.R. § 70.22(a)(8), which requires that applications contain "[p]roposed procedures to protect health and minimize danger to life or property." To determine compliance with 10 C.F.R. § 70.22(a)(8), the Staff compared the information provided in USEC's License Application related to RP against the acceptance criteria listed in NUREG-1520.[178]

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[175] See NRC Staff March 16 Brief at 3-7; Tr. at 778-84.

[176] See NRC Staff March 16 Brief at 6-7.

[177] To address the Board's questions relating to radiation safety, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented one witness, Mr. Michael A. Lamastra. Mr. Lamastra's professional qualifications are set out in NRC Staff Exhibit 54. The NRC Staff did not submit any written direct testimony for Hearing Topic HTS-13. USEC presented two witnesses: (1) Mr. Peter J. Miner; and (2) Mr. Timothy D. Taulbee. The professional qualifications of both of USEC's witnesses are set out in USEC Exhibit 1. USEC did not submit any written direct testimony for Hearing Topic HTS-13.
Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding radiation safety relative to USEC's License Application.

[178] See NUREG-1520 at 4-5.

USEC's RP program must address the occupational RP measures set out in 10 C.F.R. Parts 19, 20, and 70. Specifically, 10 C.F.R. § 20.1101 requires that:

> (a) Each licensee shall develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of [10 C.F.R. Part 20].
>
> (b) The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as reasonably achievable (ALARA).
>
> (c) the licensee shall periodically (at least annually) review the radiation protection program content and implementation.

In determining whether USEC's RP program meets the acceptance criteria, the NRC Staff reviewed USEC's request for exemptions from 10 C.F.R. § 20.1904, which requires that each container of licensed material bears a durable, clearly visible label such that the radionuclide(s) present, the quantity of radioactivity, radiation levels, kinds of materials, mass, and enrichment are identified.[179] USEC represented that it will be impractical to label each and every container in restricted areas, and instead proposes to have one sign posted in restricted areas stating that every container may contain radioactive material. USEC advised that it will perform a survey when containers are removed from contaminated, or potentially contaminated areas to prevent the spread of contamination. In addition, USEC requested that the UF_6 feed, product, and DU cylinders not be labeled because they will be readily identifiable due to their size and unique construction. USEC also stated that the UF_6 cylinders will constantly be attended by qualified radiological workers during movement.[180]

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[179] See SER at 4-15; see also supra pp. 15-17 (HTS-4 (Exemption Requests)).

[180] See SER at 4-15.

The NRC Staff reviewed USEC's exemption request and its proposal for an alternative process to ensure the containers are not mishandled, and found that USEC's request will not pose an undue hazard to life or property. However, the Staff stated that, while USEC requested two exemptions to the labeling requirements under 10 C.F.R. § 20.1904, only one exemption is needed; the exemption from labeling containers located in the Restricted Areas within the ACP. As explained by the Staff, the exemption request relating to the labeling of UF_6 cylinders during movement is not needed because 10 C.F.R. § 20.1905(c) already exempts containers from the provisions of 10 C.F.R. § 20.1904 if the containers are attended by an individual who takes the precautions necessary to prevent the exposure of individuals in excess of the established limits.[181]

Seeking clarity, the Board asked the NRC Staff to explain its interpretation of "containers attended by an individual," describe the specific details of USEC's proposed program for attending the containers, and demonstrate that this program meets the exemption requirements of 10 C.F.R. § 20.1905(c). In addition, the Board asked the Staff to elaborate on the experience at other facilities that have received the labeling exemption, specifically showing how that experience demonstrates that USEC's request will provide an equal margin of safety and will not pose an undue hazard to individuals.[182]

The Staff explained that the regulations do not provide any definition of the term "containers attended by an individual," so it used a common understanding that this phrase

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[181] See NRC Staff February 20 Response at 39.

[182] See March 2 Order at 4.

meant "either physically present or able to control access to the container."[183] The Staff witness affirmed that, as the NRC interprets this provision, the requirement that the container be attended can be satisfied either by physical proximity or, if the container is attended in a remote way, by an individual having the capacity at all times to give notice of the potential hazard to anyone who is coming close to the container.[184] The Staff also represented that all the currently operating fuel facilities have this exemption.[185]

As authorized by 10 C.F.R. § 20.1601(c), USEC has also requested that, in lieu of the requirements of 10 C.F.R. § 20.1601(a), it be allowed to have each High Radiation Area conspicuously posted "Caution, High Radiation Area," and entrance into the area controlled by a Radiation Work Permit (RWP). USEC also proposed that it will implement physical and administrative controls to prevent inadvertent or unauthorized access to High and Very high Radiation Areas. Upon reviewing this request, the Staff found USEC's use of conspicuously posted signs, in conjunction with the Applicant's RWP program, to be an acceptable alterative to the express requirements of section 20.1601(a).[186]

USEC also must have an ALARA[187] program that conforms with 10 C.F.R. § 20.1101, by maintaining occupational exposures and environmental releases as low as is reasonably

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[183] Tr. at 289-90.

[184] Id. at 294.

[185] Id. at 301.

[186] See SER at 4-16.

[187] See 10 C.F.R. § 20.1003. ALARA is an acronym for "as low as reasonably achievable," and in the context of radiation protection, it means making every reasonable effort to maintain exposure to radiation as far below the dose limits set out in 10 C.F.R. Part 20 as is possible, consistent with the activity for which the licensed activity is undertaken. 10 C.F.R. § 20.1101(b).

achievable. Under criteria specified in NUREG-1520, an applicant's ALARA program will be acceptable if it provides data and information demonstrating it meets the following commitments: (1) establish a comprehensive, effective, and written ALARA program; (2) prepare policies and procedures to ensure that occupational radiation exposures are maintained ALARA and that such exposures are consistent with applicable regulations; (3) outline specific ALARA program goals, establish an ALARA program organization, and have written implementation procedures; (4) establish an ALARA Committee or equivalent organization to ensure that the occupational dose limits of 10 C.F.R. Part 20 are not exceeded under normal operations; (5) use the ALARA program as a mechanism to facilitate interaction between RP and operations personnel; and (6) regularly review and revise the ALARA program goals and objectives and incorporate changes that could reduce radiation exposure at a reasonable cost.[188]

Based on its review, as described in the SER, the NRC Staff concluded that USEC's License Application adequately describes the goals, organization, and structure of the ALARA program, as well as USEC's commitment to prepare policies and procedures for implementing the facility design and operations, thereby ensuring that occupational exposures will be maintained ALARA.[189]

As a result of its review of USEC's RP program, the NRC Staff concluded that USEC has established and will maintain an acceptable RP program that includes: (1) an effective documented program to ensure that occupational radiological exposures are ALARA; (2) an organization with adequate qualification requirements for RP personnel; (3) approved written

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[188] NUREG-1520 at 4-3 to 4-4.

[189] See SER at 4-3 to 4-5.

RP procedures and RWPs for RP activities; (4) RP training for all personnel who have access to restricted areas; (5) a program to control airborne concentrations of radioactive material with engineering controls and respiratory protection; (6) a radiation survey and monitoring program; and (7) other programs to maintain records, report to the NRC in accordance with Parts 20 and 70, and correct for upsets at the facility. Therefore, the Staff concluded that USEC's RP program meets the requirements of 10 C.F.R. Parts 19, 20, and 70, such that conformation to the provisions of the License Application will ensure safe operation.[190]

USEC also agreed to additional record-keeping and reporting commitments, in accordance with 10 C.F.R. Part 20, Subparts L and M, in addition to 10 C.F.R. §§ 70.61 and 70.74. Acceptance criteria for the Staff's review of these additional program requirements are found in NUREG-1520, which provides that an application is acceptable if it contains data and information that meet commitments to: (1) maintain records of the RP program, radiation survey results, and results of its corrective action program; (2) establish a program to report to the NRC, within the time specified in 10 C.F.R. §§ 20.2202 and 70.74, any event that results in an occupational exposure to radiation exceeding the dose limits in 10 C.F.R. Part 20; (3) submit to the NRC an annual report, as required by 10 C.F.R. § 20.2206(b); and (4) refer to its corrective action program occupational exposures that exceed the dose limits in 10 C.F.R. Part 20, Appendix B, or are required to be reported per 10 C.F.R. § 70.74, and report the corrective action program results to the NRC.[191] In its review, the Staff determined that USEC's RP program meets these additional record-keeping and reporting requirements as well as all the

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[190] See id. at 4-16.

[191] NUREG-1520 at 4-12.

additional criteria.[192]

Based on the above, the Board finds the NRC Staff has a reasonable basis in fact and logic for its conclusions with respect to USEC's RP program to support license issuance and that the labeling exemption should be granted as proposed by the Staff.

IV. REVIEW OF NEPA-RELATED MATTERS

The Commission has directed the Board to determine whether the environmental review conducted by the NRC Staff pursuant to 10 C.F.R. Part 51 has been adequate; to verify that the requirements of NEPA § 102(2)(A), (C), and (E) have been complied with; to independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken; and to determine whether a license should be issued, denied, or conditioned to protect the environment.[193]

In the Board's February 6 Order, we presented three hearing topics and posed more than forty questions relating to the NRC Staff's environmental review.[194] As a follow up to the Staff's response,[195] the Board defined three more environmental hearing topics and asked additional clarifying questions.[196] The six resulting environmental hearing topics are discussed in detail below. The responses to the Board's specific questions are addressed within the discussion of the relevant hearing topic.

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[192] See SER at 4-16.

[193] 69 Fed. Reg. at 61,411-12.

[194] February 6 Order at 16-23, 32-37.

[195] See generally NRC Staff February 20 Response.

[196] See March 2 Order at 4-7.

HTE-1. Purpose And Need For The Facility[197]

The purpose and need of the proposed ACP is described in Section 1.3 of the FEIS in accordance with the guidance provided in NUREG-1748. As described in the FEIS, the purpose of the proposed action is to license USEC to construct and operate the ACP at the Portsmouth facility. For its environmental analysis, USEC proposes to enrich uranium up to 10 percent by weight of U-235 by the gas centrifuge process at a nominal annual production capacity of 3.5 million SWU with a potential increase to 7 million SWU. As referenced in the FEIS, and presented in oral testimony during the hearing, this plant will, inter alia, satisfy the need for enriched uranium (EU) to: (1) provide domestic supplies of EU for national energy security, and (2) fulfill electricity requirements with EU for fuel fabrication produced in a more reliable and economical manner than currently done in the United States at existing GDPs or under the Megatons-to-Megawatts program.[198]

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[197] To address the Board's questions relating to purpose and need of the ACP facility, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Mr. Matthew D. Blevins; (2) Dr. Stan Echols; and (3) Mr. Stephen D. Wyngarden, Senior Vice President, ICF International. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. See also NRC Staff [Written Direct] Testimony Related to HTE-1: Purpose and Need of the Facility (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTE-1]. USEC presented two witnesses: (1) Mr. Philip G. Sewell, Senior Vice President, American Centrifuge & Russian, HEU, USEC; and (2) Mr. Peter J. Miner. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Topics HTE-1 (Purpose and Need of Facility), HTE-4 (Final Balance Among Conflicting Factors), and HTE-6 (Cost-Benefit Analysis) (Mar. 12, 2007) [hereinafter USEC WDT/HTE-1, 4, and 6].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding the purpose and need of the ACP facility relative to USEC's License Application.

[198] See FEIS at 1-3 to 1-7. The Megatons-to-Megawatts program is an agreement between the United States and Russia, that calls for Russia to convert 550 tons of highly enriched uranium from dismantled nuclear warheads into low-enriched uranium. The United

(continued...)

In its independent review, the Board questioned: (1) how the ACP will fulfill the domestic need for EU without exclusive arrangements with domestic utilities; (2) what effect the production from the recently licensed Louisiana Energy Services, L.P. enrichment facility (LES)[199] in New Mexico will have on the need for the ACP; and (3) whether the need for 10 percent enrichment was established in USEC's License Application.[200]

The NRC Staff demonstrated there is a domestic and foreign need for EU, notwithstanding the new production from LES, and identified a further shortfall in supply should the Megatons-to-Megawatts program not be renewed after its scheduled termination in 2013.[201] As stated by the Staff, USEC estimated that its 2005 market share constituted 53 percent of North America utility demand, and 27 percent of the world market share. Foreign sources currently supply as much as 86 percent of the domestic demand for EU. These facts, according to the Staff, illustrate the significant need for additional enrichment capacity for domestic markets.[202] The Staff also discussed the large resource requirements of a GDP, including electricity, freon, and cooling water. As demonstrated by the Staff, the operating costs per SWU for the proposed gas centrifuge project are 20 percent of the operating costs for

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[198](...continued)
States Enrichment Corporation (a subsidiary of USEC), purchases the enriched portion of the "down blended" material, and after ensuring it meets required specifications, sells it to its electric utility customers for fuel in commercial nuclear power plants. See id. at 1-4.

[199] Louisiana Energy Servs., L.P. (National Enrichment Facility), LBP-06-17, 63 NRC 747, 828 (2006).

[200] See February 6 Order at 32; see also Tr. at 679-82.

[201] See FEIS at 1-3 to 1-5; see also NRC Staff WDT/HTE-1 at 4-5.

[202] See FEIS at 7-7 to 7-8; see also NRC Staff February 20 Response at 70.

a GDP due in large part to the high electrical demands of the gaseous diffusion process.[203] Based on these facts, the need for a reliable and economic source of EU available to US markets is apparent to the Board.

The NRC Staff noted that USEC proposed that it be authorized to enrich uranium up to 10 percent U-235 in order to provide for greater flexibility in its business plans and to meet potential markets that may develop with future technology improvements, even though there is no commercial demand for EU at the 10 percent level at this time.[204] During the oral hearing, USEC testified that there may be a future need for higher enrichments to meet the potential requirement for more efficient, less expensive, and longer fuel cycles that will be associated with future generations of reactor designs.[205] Since, however, there is little additional environmental impact when changing from 5 percent to 10 percent enrichment, it is the Staff's opinion that a significant demonstration of need is not necessary to justify a 10 percent enrichment level. It is the Staff's opinion that NEPA requires only that the purpose and need section consist of a brief statement to help define an appropriate range of alternatives to be discussed.[206]

In our independent review, the Board finds that the purpose and need section in the FEIS is simply a statement of what the proposed federal action will accomplish and a description of the underlying need for this action. It helps guide the development of reasonable alternatives, which can satisfy the objectives of USEC in accordance with the Commission's

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[203] See FEIS at 1-6 to 1-7, 7-8 to 7-9.

[204] See Tr. at 678, 680.

[205] Id. at 700.

[206] See id. at 681-82.

review guidance documents.[207] Although not a specific NEPA evaluation criterion, the Board finds that the proposed ACP will provide an additional supply of reliable, economical EU that will be available to domestic utilities to meet their current needs. In addition, the ACP will also have the flexibility to provide enrichment up to 10 percent U-235 if technology improvements allow for more efficient fuel utilization at these levels in the future.[208]

HTE-2. Impacts Of DU Disposal[209]

In its independent analysis of conflicting factors, the Board questioned the NRC Staff on its evaluation of the environmental impacts associated with the disposal of DU from the ACP.[210] USEC's current plan is to transfer DU from the proposed ACP to DOE for dispositioning (i.e.,

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[207] See NUREG-1748 at 5-5.

[208] See Tr. at 699-700.

[209] To address the Board's questions relating to the impacts of DU disposal, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Mr. Matthew D. Blevins; (2) Mr. Donald T. Hammer; (3) Mr. Timothy C. Johnson; (4) Dr. Michael Tokar, Retired from NRC; and (5) Dr. Raymond P. Wood. The professional qualifications of Mr. Blevins, Mr. Hammer, Mr. Johnson and Dr. Wood are set out in NRC Staff Exhibit 54. Dr. Tokar's professional qualifications are set out in NRC Staff Exhibit 54A. Mr. Hammer and Dr. Tokar did not submit written direct testimony for Hearing Topic HTE-2. See NRC Staff [Written Direct] Testimony Related to HTE-2: Impacts of DU Disposal (Mar. 5, 2007) [hereinafter NRC Staff WDT/HTE-2]. USEC presented two witnesses: (1) Mr. Greg E. Fout; and (2) Mr. Peter J. Miner. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See also [USEC's Written Direct] Testimony Concerning Hearing Issue HTE-2 (Impacts of DU Disposal) (Mar. 12, 2007) [hereinafter USEC WDT/HTE-2].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding the impacts of DU disposal relative to USEC's License Application.

[210] The Commission has determined that DU is classified as a low-level waste (LLW), (Louisiana Energy Servs., L.P. (National Enrichment Facility), CLI-05-05, 61 NRC 22, 34-35 (2005)), and pursuant to 10 C.F.R. § 61.55(a), is a Class A LLW.

deconversion and disposal), as allowed by the USEC Privatization Act[211] for an NRC-licensed enrichment licensee. In its estimate of decommissioning costs, the Staff represented that DOE submitted cost estimates to USEC using quotes for near-surface burial from EnergySolutions.[212]

In the Board's view, at issue here was: (1) whether the near-surface disposal method of the large quantities of DU to be generated at the ACP meets the performance requirements of 10 C.F.R. Part 61; (2) whether the NRC Staff's conclusion in the FEIS that DU disposal impacts will be SMALL[213] is reasonable for the quantities to be generated at the ACP, thereby meeting its NEPA obligation for this activity; and (3) whether the decommissioning cost estimates reflect realistic funding for this disposal.[214]

Two separate determinations are needed to address whether the NRC Staff's NEPA review for DU disposition, at the large quantities to be generated at the ACP, is adequate. First, is whether EnergySolutions is properly licensed to accept the ACP's large quantities of DU, i.e. whether the impacts of near-surface disposal of such large quantities of DU were assessed by Utah (as an agreement State) for the EnergySolutions site at the time it was licensed and were found to meet Utah's equivalent of NRC's 10 C.F.R. Part 61 performance objectives. Second, is whether the Staff has independently reviewed the determination made

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[211] USEC Privatization Act § 3113, 42 U.S.C. § 2297h-11.

[212] See NRC Staff WDT/HTS-7 at 13.

[213] As used by the NRC Staff in its NEPA assessment, 10 C.F.R. Part 51, Subpart A, Appendix B, Table B-1 provides the following definitions of significance levels: SMALL – "environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource"; MODERATE – "environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource"; LARGE – "environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource."

[214] See February 6 Order at 33-34.

by Utah and exercised independent judgment in determining the radiological impacts of near-surface disposal of the large quantities of ACP DU at the Utah site.

As part of USEC's License Application, the NRC Staff received a confirmation letter from the State of Utah stating that EnergySolutions can accept DU for near-surface burial without any restrictions on the quantity of DU.[215] The issuance of the license by the State of Utah was based on a site specific analysis of the potential health effects of shallow land disposal at the EnergySolutions site. The results of this analysis demonstrate that Utah's requirements (equivalent to 10 C.F.R. Part 61, Subpart C performance objectives) are met, and the State of Utah found that the EnergySolutions can accept large quantities of DU up to its total disposal capacity.[216]

The NRC Staff then independently reviewed the basis for EnergySolutions' license and the results of pathway evaluations to ensure compliance with the low-level radioactive waste performance objectives in 10 C.F.R. Part 61, Subpart C.[217] Following this independent review, the Staff concluded that disposal of large quantities of DU at the EnergySolutions site is consistent with the performance objectives in the NRC regulations, and that the environmental impacts will be SMALL.[218] The Staff's conclusions are consistent with the findings made in a similar case dealing with the recently licensed enrichment facility being constructed by LES in

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[215] See NRC Staff WDT/HTS-7 at 14.

[216] See id. at 16; see also Staff Exh. 17 (Evaluation of the Potential Public Health Impacts Associated with Radioactive Waste Disposal at a Site Near Clive, Utah (June 1990)); NRC Staff WDT/HTE-2 at 5.

[217] See NRC Staff WDT/HTE-2 at 4-13; Tr. at 610-15.

[218] See NRC Staff WDT/HTE-2 at 6.

New Mexico.[219]

In regard to the next question, the realism in the decommissioning cost estimate hinges on whether EnergySolutions will have sufficient capacity when it will be needed for disposal of ACP-generated DU waste. The NRC Staff testified at the oral hearing that all the DU tailings from DOE facilities, LES, and the ACP combined will account for only 20 percent of EnergySolutions' current capacity. Although the timing for the arrival of ACP tails is speculative (depending upon the sequence of deconversion that DOE performs at the Portsmouth facility), in the Staff's judgment, there will be sufficient capacity for DU tailings from the ACP plant at the existing, or potentially expanded, EnergySolutions site. Likewise, the Board was advised by the Staff that as an alternative, DOE could place this material at the Nevada Test Site, which has an extremely large capacity.[220]

As discussed in more detail under HTS-7 (Decommissioning Funding),[221] the NRC Staff testified that USEC will be under a continuing obligation to update its cost estimate to fully fund its financial assurances so that decommissioning can be performed in a manner that is protective of public health and safety regardless of changes in regulatory requirements, changes in the cost estimate, or changes in USEC's financial condition.[222] This procedure provides assurance that any change in disposal costs will be addressed in the decommissioning funding. While the costs for the disposition of DU tails differed between the SER and the FEIS,

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[219] Louisiana Energy Servs., L.P. (National Enrichment Facility), LBP-06-08, 63 NRC 241, aff'd CLI-06-15, 63 NRC 687 (2006).

[220] Tr. at 595-600.

[221] See supra pp. 23-30.

[222] See NRC Staff WDT/HTS-7 at 17.

the number in the SER is the most recent estimate.[223] The small difference in the unit costs does not affect the conclusions presented in the FEIS.[224]

In its independent assessment, the Board finds that: (1) USEC's License Application relating to DU disposal is based on its plan to transfer its DU to DOE for disposition; (2) this plan is a plausible strategy authorized for LLW from uranium enrichment facilities by the USEC Privatization Act; (3) DOE based its disposal plans for USEC's DU on near-surface burial at EnergySolutions' facility; (4) Utah found that near-surface disposal of large quantities of DU at EnergySolutions' facility meets its requirements; (5) Utah's requirements are equivalent to 10 C.F.R. Part 61, Subpart C performance objectives; and (6) EnergySolutions can accept large quantities of DU up to its disposal capacity. Based on this, the Board finds that the NRC Staff's conclusion that the environmental impacts for the disposal of DU will be SMALL is reasonable and adequately supported by the facts in the record of this proceeding. The Board further finds that the Staff has taken the requisite hard look under NEPA and has performed an independent assessment as necessary.

HTE-3. Environmental Monitoring

The NRC Staff testimony and Board findings related to environmental monitoring, including the need for and extent of groundwater monitoring and the availability of baseline data to assure releases from the ACP could be separated from historic impacts, were discussed in conjunction with HTS-9, and need not be repeated here.[225]

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[223] See NRC Staff WDT/HTS-7 at 13.

[224] See Tr. at 618.

[225] See supra pp. 36-40.

HTE-4. Final Balance Among Conflicting Factors[226]

As mandated in the Notice of Hearing,[227] the Board is tasked with independently considering the final balance among conflicting factors in the record, which, in the Board's judgment includes: (1) environmental impacts of the proposed action as compared to alternatives; (2) unavoidable adverse environmental impacts and proposed mitigative actions; (3) potential cumulative impacts; (4) irreversible and irretrievable commitment of resources; and (5) the relationship between short-term uses and long-term productivity of the human environment. The Board's balancing of these conflicting factors is discussed below in our NEPA findings.

In response to our initial questions,[228] the NRC Staff referenced six places in the FEIS where the conflicting factors were discussed, and further elaborated on the comparison of the benefits and costs of the project.[229] At the oral hearing, the Staff clarified the following issues: (1) justification for the difference in impacts between the proposed action and the no-action alternative for Waste Management and for Public and Occupational Health, and potential

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[226] To address the Board's questions relating to the final balance among conflicting factors, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Mr. Matthew D. Blevins; and (2) Mr. Mr. Stephen D. Wyngarden. The professional qualifications of both of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. The NRC Staff did not submit any written direct testimony for Hearing Topic HTE-4. USEC presented two witnesses: (1) Mr. Peter J. Miner; and (2) Mr. Philip G. Sewell. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See also USEC WDT/HTE-1, 4, and 6].

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding the final balance among conflicting factors relative to USEC's License Application.

[227] 69 Fed. Reg. 61,411.

[228] See February 6 Order at 17.

[229] See NRC Staff February 20 Response at 55-59.

changes in the FEIS conclusions with changes to the impact level for each of these affected environments; (2) verification of the type of socioeconomic impact and reasons for a higher impact from a gas centrifuge enrichment plant at DOE's Paducah, Kentucky site (Paducah) (which has a currently operating GDP) than for the ACP at Portsmouth; and (3) discussion of the impact of handling hydrofluoric acid at locations other than the ACP.[230]

With respect to the Board's first issue, the NRC Staff testified that it was not likely that the impact level from the no-action alternative (which includes continued operation of the GDP at Paducah) would be greater than impacts from the proposed action (construction and operation of the ACP) for the affected environment categories of Public and Occupational Health and Waste Management, as shown on Table 2-8 of the FEIS.[231] The Staff explained that Table 2-8 is a summary of the detailed discussion in Chapter 4 of the FEIS, which discusses the SMALL impacts of both the proposed action and the no-action alternative on Public and Occupational Health and on Waste Management. The Staff explained that the SMALL to MODERATE listed in Table 2-8 under the no-action alternative for these two affected environments are misprints, i.e., the impact should be SMALL in the table to be consistent with stated impacts in Chapter 4. The discussion in Chapter 4 was the basis for the Staff's conclusions in FEIS, and, as such, the Staff testified that the misprints in Table 2-8 had no bearing on its recommendations therein.[232]

Next, the NRC Staff testified that socioeconomic costs associated with the proposed action evaluated by the Staff include: (1) indirect costs to the local economy around Piketon,

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[230] Tr. at 701-06.

[231] FEIS at 2-60 to 2-61.

[232] Tr. at 702-04; see also FEIS at 4-118 to 4-119.

including impacts to area housing resources, community and social services, and public utilities; (2) economic impacts including direct and indirect job creation during construction and operation, and increased tax revenues; and (3) impacts associated with ceasing operations at Paducah including reduction in the number of full-time workers (mitigated somewhat by the hiring of decommissioning workers), and small impacts to local tax revenues, population size, area housing resources, community and social services, and public utilities.[233] For the no-action alternative, the reduction of full-time workers at Paducah would not occur, but economic impacts with the proposed action would occur with additional domestic enrichment facilities in the future. The net result for socioeconomic impacts would be an increase in jobs for both the proposed action and the no-action alternative, although the Staff does not apply subjective qualifiers like "positive" or "negative" in its summary and comparison of alternatives.[234]

Lastly, the NRC Staff clarified that the challenges of managing and disposing of hydrofluoric acid when deconverting DU at fuel fabrication plants also applies to the Portsmouth and Paducah deconversion facilities. Therefore, the discussion in the FEIS applies to deconversion at Portsmouth as proposed for the ACP, as well as any other potential deconversion facility.[235]

The Staff addressed the Board's concerns relating to the final balancing of conflicting factors performed in the FEIS. The Board's independent balancing is included below under our

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[233] See FEIS at 4-29 to 4-37.

[234] See Tr. at 704-05.

[235] See id. at 705-06; see also FEIS at 2-49.

NEPA determinations.[236]

HTE-5. Liquid Effluent Control System[237]

The Board questioned the NRC Staff on the details of the MCW and LEC systems to understand whether they are a potential source of inadvertent radionuclide releases to the environment. Specifically, the Board sought to understand better the extent to which there will be buried tanks and pipelines associated with the ACP, USEC's proposed monitoring program, and the ability of that program to detect inadvertent radiological releases to the environment.[238] These questions were explored further as part of this hearing topic regarding the operation of the MCW system and the LEC system.

As part of the facility description presented at the start of the oral hearing, the NRC Staff clarified that the proposed MCW system will use a closed loop to cool components including, evacuation and purge vacuum pumps used to remove residual material from the centrifuges; the motor that spins the rotor; and centrifuge diffuser pumps.[239] Heat will be rejected from the

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[236] See infra pp. 83-92.

[237] To address the Board's questions relating to the liquid effluent control system, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented six witnesses: (1) Mr. Matthew D. Blevins; (2) Dr. Stan Echols; (3) Mr. Donald T. Hammer; (4) Mr. Michael A. Lamastra; (5) Mr. Todd E. Stribley; and (6) Dr. Raymond P. Wood. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. The NRC Staff did not submit any written direct testimony for Hearing Topic HTE-5. USEC presented two witnesses: (1) Mr. Greg E. Fout; and (2) Mr. Peter J. Miner. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See USEC WDT/Environmental Monitoring.

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding liquid effluent control system relative to USEC's License Application.

[238] See February 6 Order at 18; March 2 Order at 4-5.

[239] See Tr. at 156-159.

closed cooling loop through a heat exchanger to the cross-flow mechanical cooling tower.[240] The current design does not require any direct cooling of the centrifuge rotors. The MCW cooling water will pass around the pumps and motors, but will not come into contact with any pump fluid, or the motor driven units.[241] USEC explained that this system will cool components exterior to the centrifuge machines, using operating pressures higher than the components it cools. Process gases that will be handled by pumps cooled with this system will be under large vacuum pressures. Any unanticipated leakage between the cooling water jacket surrounding the pump and the contents in the pump will result in the inflow of cooling water into the process gas system for control and removal. Based on these factors, USEC testified that there is no realistic potential for radionuclides to be in the cooling liquid of the MCW system.[242]

The LEC system is a floor drain system used to collect any spills or releases from within the process buildings, particularly leaks from the MCW system or a fire sprinkler activation.[243] There is a drain under each individual centrifuge that is connected by solvent-welded plastic piping to four 550 gallon fiberglass collection tanks located at the cardinal points of each building. Exclusive of the sewer and storm water lines, USEC testified that there are no other buried pipelines or tanks at the ACP besides the LEC system components that could potentially contain radioactivity.[244]

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[240] See NRC Staff Exh. 3A, at 32-33.

[241] See Tr. at 452.

[242] Id. at 625, 636.

[243] See NRC Staff WDT/HTE-3/HTS-9 at 9; Tr. at 627-28.

[244] Tr. at 627, 661.

The tanks in the LEC system are designed for use as contingent or hold-up capacity in the event of liquid spills or releases in the process buildings. Any fluid that accumulates in the collection tanks will be sampled and analyzed prior to disposal.[245] If contents meet the concentration limits and other requirements of 10 C.F.R. § 20.2003, the fluid can be pumped to the sanitary sewer system.[246] Otherwise, USEC advised that the contents will be containerized for disposal at facilities that will take the liquid waste.[247] USEC stated that the potential for leakage from the LEC tanks will be monitored by two daily inspections of level gauges attached to the tanks. Because of the frequency of monitoring and the accuracy of the level gauges (i.e., a change of one-inch in the gauge level is equivalent to 3 gallons of liquid), USEC concluded that it will be able to detect small seeps from the system.[248]

The Board finds reasonably supported the NRC Staff's conclusion that the likelihood of a radiological release to the environment from these systems is minimal, and that liquids potentially containing radioactivity from the process buildings will be collected by the LEC system, sampled, and discharged in a manner appropriate to its quality. Based on the testimony describing the design and operation of the MCW and LEC systems, the Board finds that it is unlikely that there will be release of radioactivity to the groundwater from the MCW and LEC systems that will compromise the public health and safety or the environment.

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[245] See id. at 627-28.

[246] See NRC Staff WDT/HTE-3 at 10.

[247] See Tr. at 645.

[248] See id. at 662-63.

HTE-6. Cost-Benefit Analysis[249]

In accordance with 10 C.F.R. § 51.71 and recommendations in NUREG-1748, the NRC Staff performed a cost-benefit analysis of construction and operation of the ACP, and compared the incremental costs of the proposed action to the increase in benefits over the no-action alternative. The results were then summarized in Chapter 7 of the FEIS, and: (1) provide a rationale for deciding the likelihood of a net positive economic impact resulting from the project; (2) compare alternatives for achieving the stated purpose and needs of the proposed action; and (3) provide an objective rationale for choosing between competing alternatives.[250]

In its analysis, the NRC Staff compared the costs of the ACP to the projected economic and energy benefits, and qualitatively concluded that the benefits of the ACP outweigh its costs. The Staff stated that the analytical method applied to the proposed action consisted of quantifying life cycle costs of the facility, and identifying qualitative costs and benefits to the economy and environment in accordance with NUREG/BR-0184, Regulatory Analysis Technical

[249] To address the Board's questions relating to the cost-benefit analysis, the NRC Staff and USEC proffered expert witnesses who provided both written and oral testimony. The NRC Staff presented three witnesses: (1) Mr. Matthew D. Blevins; and (2) Mr. Donald T. Hammer; and Mr. Stephen D. Wyngarden. The professional qualifications of each of the NRC Staff witnesses are set out in NRC Staff Exhibit 54. The NRC Staff did not submit any written direct testimony for Hearing Topic HTE-6. USEC presented two witnesses: (1) Mr. Peter J. Miner; and (2) Mr. Philip G. Sewell. The professional qualifications of both of the USEC witnesses are set out in USEC Exhibit 1. See USEC WDT/Environmental Monitoring.

Based on the respective qualifications and experience of the proffered witnesses, the Board found that each of these individuals was qualified to testify as an expert witness regarding cost-benefit analysis relative to USEC's License Application.

[250] See NRC Staff Exh. 63 at 3 (Hearing Presentation for HTE-6).

Evaluation Handbook.[251] The Staff also performed a comparative cost-benefit analysis between the ACP and alternatives to the project. As discussed below under our NEPA review, all the site, location, source, and technology alternatives were appropriately eliminated from further consideration in the FEIS prior to the comparison analyses.[252] The no-action alternative, which includes continued operation of the Paducah GDP and down-blending of highly enriched uranium under the Megatons-to-Megawatts program, was then left for comparison with the proposed action.[253]

In its independent review, the Board asked the NRC Staff, inter alia, to: (1) explain the basis for the numbers presented in Tables 7-1 and 7-2 of the FEIS;[254] (2) verify that the basis for the Staff's cost-benefit analysis is consistent with USEC's estimate of its product market (i.e., 53 percent market share of North America utilities demand and 27 percent market share of world market demand); and (3) discuss the rationale for including, as one of the benefits, the ACP fulfilling the need for domestic electricity requirements given that there are no statutory, regulatory, or binding legal requirements that prohibit the sale of EU for peaceful use in foreign counties.[255]

In response, the NRC Staff submitted written answers to the Board's initial questions.[256] In addition, at the oral hearing, the Staff provided a presentation and answered questions

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[251] NRC Staff Exh. 63 at 7; see also Tr. at 714-15.

[252] See FEIS at 2-36 to 2-49; see also infra pp. 85-88.

[253] See FEIS at 2-35 to 2-36.

[254] FEIS at 7-2, 7-5.

[255] See February 6 Order at 20; March 2 Order at 5-6.

[256] See NRC Staff February 20 Response at 69-71.

relating to this hearing topic.[257] The Staff's presentation described the purpose of the cost-benefit analysis, the analytical methodology used, a summary of results, the limitations of the analysis, and its overall conclusions. The Staff testified that sources of raw data for the analytical method used to prepare the cost-benefit analysis included numerous topical areas in the description of site impacts from the ACP presented in Chapter 4 of the FEIS, USEC's Environmental Report (ER), and USEC's response to Staff Requests for Additional Information.[258] In addition, the Staff stated that the cost-benefit analysis was consistent with the distribution share presented by USEC, and that its conclusions would not change if all of the ACP product was shipped to foreign markets, because the Staff did not include a benefit factor accounting for increased domestic source of EU.[259]

In comparison with the no-action alternative, benefits were calculated for two scenarios for the ACP operating at 7 million SWU per year. These scenarios included the proposed action replacing two levels of capacity (4.6 million SWU and 7 million SWU) at Paducah. In the comparison analyses, the benefits were calculated using the reduction in unit operating costs with the energy efficient ACP in place of the resource intensive GDP at Paducah. This unit cost reduction was then multiplied by the level of SWU that is replaced in a given year as the ACP capacity is increased and GDP output at Paducah is reduced. In this analysis, it was assumed that the ACP will reach 1 million SWU per year by 2010, 3.5 million SWU per year by 2011, and

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[257] Tr. at 710-49; see also NRC Staff Exh. 63.

[258] See NRC Staff Exh. 63 at 6.

[259] See Tr. at 747.

7 million SWU per year by 2015.[260]

In its independent review of the cost-benefit analysis, the Board found that quantitative costs associated with each life-cycle phase of the proposed action and the qualitative costs to the economy and environment will be SMALL in comparison with economic and national energy benefits of the ACP. During the presentation of comparative benefits at the oral hearing, it was apparent to the Board that the expectation that the ACP will increase to 7 million SWU per year provides a more favorable cost-benefit analysis for the proposed action when compared to the no-action alternative than if the plant remained at 3.5 million SWU capacity. The NRC Staff concurred with this assessment since the impact costs will be similar for the two capacity levels.[261] Based on additional Staff testimony, the Board finds that there are still large resource savings at 3.5 million SWU when changing from the diffusion technology in use at Paducah to the centrifuge technology that will be used at the ACP. Although not as favorable as the results for a 7 million SWU capacity, the overall conclusions of the cost-benefit analysis for a 3.5 million SWU per year capacity plant, when compared to the no-action alternative, will not change in any meaningful way.[262]

Based on its independent weighing of the factors associated with the cost-benefit analysis, the Board finds that there are economic and national energy benefits to be derived from the licensing of the ACP. While there will be indirect costs resulting from impacts on various resource areas, the impacts will be small in magnitude when compared to the resulting benefits. As a result, the Board finds that construction and operation of the ACP on its own, or

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[260] See id. at 732-36

[261] See id. at 735-36.

[262] See id. at 736; see also NRC Exh. 63 at 16.

in comparison with the no-action alternative, yields significant net positive benefits.

V. NEPA FINDINGS

The Board now addresses the NEPA findings we must make. The Board's review and conclusions are summarized herein.

A. Regulations And Guidelines Relating To NEPA

In accordance with NEPA and the NRC's implementing regulations – contained in 10 C.F.R. Part 51 – the NRC Staff was required to prepare an FEIS as part of its review of USEC's License Application. Pursuant to the applicable regulations, the FEIS must discuss the potential environmental impacts of the proposed ACP, including an evaluation of alternatives to determine whether there are any obviously superior options to the proposed action. In addition, the FEIS analysis must compare the environmental costs of the facility to the Staff's assessment of the benefits derived from the additional domestic supply of EU and the presence of upgraded enrichment technology in the United States.[263]

The NRC Staff reviewed USEC's ER in preparing the FEIS. In accordance with 10 C.F.R. §§ 51.45 and 51.50, USEC's ER considered, inter alia: (1) impacts of the proposed action on the environment, discussed in proportion to their significance; (2) unavoidable adverse environmental effects; (3) alternatives to the proposed action, presented in a comparative form to the extent practicable; (4) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and (5) any, irreversible and irretrievable commitments of resources.[264]

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[263] See Notice of Intent to Prepare an [EIS] for the Proposed USEC [ACP], 69 Fed. Reg. 61,268 (Oct. 15, 2004).

[264] See 10 C.F.R. § 51.45(b)(1)-(5).

Based on the information in USEC's ER, the NRC Staff prepared its FEIS in accordance with 10 C.F.R. § 51.71 and the review guidance provided in NUREG-1748. The Staff's evaluation included, inter alia, an analysis that considered and weighed the environmental impacts of alternatives to the proposed action, and alternatives available for reducing or avoiding adverse environmental effects.[265] The Staff's analysis of alternatives included: (1) a discussion of alternatives to the recommended course of action, because the ACP proposal involves unresolved conflicts concerning alternative uses of available resources;[266] (2) a discussion of the no-action alternative; and (3) a comparison of alternatives.

Following the standards established by the Commission, environmental issues were evaluated using three-levels of significance – SMALL, MODERATE, LARGE – a framework developed by the NRC Staff based on guidelines contained in CEQ regulations.[267] Following guidance provided in NUREG-1748, the impacts have been presented in the FEIS in comparative form for the proposed action and the no-action alternative.[268]

As noted above, the Board must determine, inter alia, if the record of this proceeding contains sufficient information to conclude that the NEPA review conducted by the NRC Staff has been adequate, and we must reach an independent determination on the three NEPA issues.[269] The Commission provided guidance to the Board regarding the depth of review

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[265] See 10 C.F.R. § 51.71(d).

[266] See 42 U.S.C. § 4332(2)(E); 10 C.F.R. § 51.45(b)(3).

[267] See NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants.

[268] FEIS at 2-49 to 2-61 (Table 2-8).

[269] See supra pp. 5-6.

necessary to address these NEPA issues.[270] First, the Board shall not conduct a de novo evaluation of the application. Second, in reaching its independent determination, the Board should not second-guess or look behind the underlying technical or factual findings of the NRC Staff, except when it finds that the Staff's review is incomplete, or that the Staff findings lack sufficient explanation, or are not supported by fact and logic.[271] The Board's findings on these NEPA issues follow in the next three sections.

B. Adequacy Of The NRC Staff's NEPA Review

Pursuant to NEPA and the NRC's regulations set forth in 10 C.F.R. Part 51, the NRC Staff prepared its FEIS to assess the potential environmental impacts of constructing, operating, and decommissioning a uranium enrichment facility at the Portsmouth facility.[272] The Staff examined and evaluated the data and analyses contained in USEC's ER, following the procedural requirements of 10 C.F.R. Part 51 for conducting a scoping process to help identify issues that are relevant, issues that are beyond the scope of the FEIS and do not warrant additional detailed discussion, and issues that are not directly related to its impact assessment. To initiate its procedural requirements, the Staff published a Notice of Intent to Prepare an EIS in late 2004.[273] The Staff then toured the proposed ACP, held a public scoping meeting in Piketon, Ohio, and issued the Environmental Scoping Summary Report in 2005.[274] In preparing the FEIS, the Staff summarized the applicable federal, statutory, and regulatory requirements,

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[270] See CLI-05-17, 62 NRC at 45.

[271] See id.

[272] FEIS at 1-1 to 1-3.

[273] 69 Fed. Reg. at 61,268.

[274] See FEIS at 1-8.

and complied with the consultation requirements of the Endangered Species Act of 1973, the National Historic Preservation Act of 1966, Fish and Wildlife Coordination Act of 1934, and the Farmland Protection Policy Act of 1981.[275]

In its analysis, the NRC Staff examined both the proposed action and the purpose and need for the proposed action, as explained by USEC in its ER. As discussed in detail with respect to HTE-1 (Purpose and Need for the Facility),[276] the Staff found that the proposed ACP will fulfill the needs outlined by USEC. The FEIS evaluated several potential alternatives to the proposed action, including the no-action alternative, which the Staff determined will result in EU needs continuing to be met with existing foreign and domestic enrichment suppliers, including continued operation of the GDP at Paducah, and down-blending of highly enriched uranium under the Megatons-to-Megawatts program.[277] As will be discussed in more detail below, these alternatives were eliminated from further consideration in the FEIS because they fail, for various reasons, to satisfy the goals of USEC and the need for this facility.

The NRC Staff evaluated the potential mitigation measures proposed by USEC and identified additional potential mitigation measures relating to the impact of construction on air quality.[278] The Staff also reviewed the proposed environmental measurement and monitoring programs.[279] After evaluating the potential environmental impacts from the proposed action, the Staff determined that, overall, the environmental impact will be SMALL, although they could be

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[275] See id. at 1-11, 1-29 to 1-33, 9-1 to 9-2.

[276] See supra pp. 56-59.

[277] FEIS at 2-35 to 2-36.

[278] See id. at 5-1 to 5-4.

[279] See id. at 6-1 to 6-12.

as high as MODERATE for impacts on air quality, socioeconomics and transportation.[280]

As discussed in HTE-6 (Cost-Benefit Analysis),[281] the NRC Staff reviewed the costs and benefits of the proposed action, including direct and indirect costs. The Staff estimated that the environmental costs will be small in magnitude and in comparison to the benefits of the proposed action, and when compared to the no-action alternative, found that the proposed action outranks on all substantive impact areas, and that there will be a net benefit to the proposed action.[282]

Based on these facts, the Board has determined that the NRC Staff's review of USEC's License Application pursuant to 10 C.F.R. Part 51 has been adequate, and that the record of this proceeding contains sufficient information to support the Staff's conclusions.

C. Compliance With NEPA Sections 102(2)(A), (C), (E), And 10 C.F.R. Part 51

This Board is required to independently determine whether the requirements of NEPA Sections 102(2)(A), (C), and (E) and the regulations in 10 C.F.R. Part 51 have been met.

1. Section 102(2)(A) Compliance

Section 102(2)(A) of NEPA requires the agency to use a "systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment."[283] Environmental impacts of construction, operation, and decommissioning of the ACP and from centrifuge manufacturing, were presented in Chapter 4

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[280] See id. at 2-61 to 2-62.

[281] See supra pp. 70-74.

[282] See FEIS at 7-1 to 7-2, 7-5, 7-10.

[283] 42 U.S.C. § 4332(2)(A).

of the FEIS. In addition to the more natural environmental impacts, the NRC Staff also considered socioeconomic, historic and cultural resources, as well as environmental justice impacts. Socioeconomic impacts include physical impacts, social and economic issues, demography, infrastructure, and community services. Cumulative impacts and impacts of the no-action alternative were also addressed in FEIS Chapter 4.

The Board finds that the NRC Staff's description of these impacts, based on USEC's ER, was prepared in accordance with NUREG-1748 and 10 C.F.R. §§ 51.71 thru 51.93. Finally, the Staff demonstrated that it used a systematic, interdisciplinary approach as the basis for its decisions in the FEIS. Based on these facts, the Board finds that Section 102(2)(A) of NEPA has been complied with in this proceeding.

2. Section 102(2)(C) Compliance

Section 102(2)(C) of NEPA requires the agency to include in the FEIS a detailed statement on: (1) "the environmental impact of the proposed action"; (2) "any [unavoidable] adverse environmental effects"; (3) "alternatives to the proposed action"; (4) "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity"; and (5) "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented."[284] In accordance with 10 C.F.R. § 51.71(d), the comparison analysis must include the economic, technical and other benefits of the proposed action and alternatives to those comparative costs.

First, Chapter 4 of the FEIS comprises over 100 pages of text presenting a detailed description of the environmental impacts of the proposed construction, operation, and decommissioning of the ACP. As summarized in Chapter 8 of the FEIS, the unavoidable

[284] 42 U.S.C. § 4332(2)(C)(i)-(v).

impacts from the proposed action will be SMALL for land use, historic and cultural resources, visual and scenic resources, geology and soils, water resources, ecological resources, environmental justice, noise, public and occupational health, and waste management. Air quality, socioeconomic, and transportation impacts will be SMALL to MODERATE.[285]

Second, as described in Chapter 5 of the FEIS, USEC has proposed mitigation methods for impacts to geology and soils, water resources, ecological resources, public and occupational health, air quality, and waste management. USEC did not propose any mitigation methods for the impacts related to land use, transportation, noise, historic and cultural resources, visual and scenic resources, socioeconomics, and environmental justice.[286] The NRC Staff represented that it will incorporate license application documents (which include mitigation methods presented in USEC's ER) directly into the license by tie-down references.[287] The Staff reviewed the proposed mitigation methods and identified additional construction measures for air quality that will be sufficiently beneficial to warrant implementation. These measures include the use of Tier-2 construction-related vehicles and the use of ultra-low sulfur diesel fuel to reduce emissions of particulate matter.[288] The Staff did not include these construction measures as a license condition, however, because the percent reduction in particulate matter emissions is expected to be small, and the site is located in an area that is exempt from restrictions on

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[285] FEIS at 8-1 to 8-3.

[286] Id. at 5-2 to 5-3.

[287] See NRC Staff February 20 Response at 65; NRC Staff WDT/HTS-3 at 5-7.

[288] See FEIS at 5-4.

emissions from fugitive dust.[289]

Third, in Chapter 2 of the FEIS, alternatives to the proposed action were developed and analyzed by the NRC Staff including, the no-action alternative, alternative locations for the ACP, alternative sources of EU, and alternative enrichment technologies. For reasons discussed below,[290] all alternatives, except the no-action alternative, were eliminated prior to the comparison analyses.

In regard to the fourth required element of an FEIS, the NRC Staff found that the construction and operation of the proposed ACP will involve the short-term commitment of resources including land, water, electricity, fuel, and other construction raw materials. These short-term resource commitments will be, in the judgment of the Staff, off-set by the long-term socioeconomic benefits to the local area and the region through increased and continued employment and expenditures, which, in turn, will have the potential to further facilitate long-term productivity in the local area and region through investments in local businesses.[291]

The NRC Staff found that the impacts from the irretrievable commitment of resources for the proposed ACP, including the commitment of land, water, energy, raw materials, and other construction and operational resources, will be SMALL.[292] In regard to the use of water resources, the Staff clarified that the ACP will increase the daily water use from the three existing well fields from 5.5 million gallons to 6.15 million gallons, and that this rate will be only 46 percent of the 13 million gallons per day used by the Portsmouth GDP prior to cold

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[289] See id.

[290] See infra pp. 85-88.

[291] See FEIS at 8-3 to 8-4.

[292] See id. at 8-4.

shutdown in 2001.[293]

Section 102(2)(C) also requires the agency to consult with and obtain comments from other federal, state, and local agencies and from the public prior to making the detailed statements discussed above. A list of the agencies and persons consulted, public comments, and key consultation correspondence is documented in Chapter 9 of the FEIS. Consultation letters and public comments are included in Appendices B, J, and K of the FEIS.

Based on the facts discussed above, the Board finds that the NRC Staff has provided a detailed statement on: (1) "the environmental impact of the proposed action"; (2) "any [unavoidable] adverse environmental effects"; (3) "alternatives to the proposed action"; (4) "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity"; and (5) "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented."[294] The analysis included a comparison of the economic, technical, and other benefits of the proposed action and no-action alternative to the accompanying costs. As a result, the Board finds that Section 102(2)(C) of NEPA has been complied with in this proceeding.

3. Section 102(2)(E) Compliance

Section 102(2)(E) of NEPA requires the agency to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."[295] The FEIS evaluated several potential alternatives to the construction and operation of the proposed ACP, including

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[293] See NRC Staff February 20 Response at 60.

[294] 42 U.S.C. § 4332(2)(C)(i)-(v).

[295] 42 U.S.C. § 4332(2)(E).

the no-action alternative, which the NRC Staff determined will result in EU needs continuing to be met with foreign and existing domestic enrichment suppliers, including continued operation of the Paducah GDP and down-blending of highly enriched uranium under the Megatons-to-Megawatts program.[296] As described in more detail in below,[297] the Staff considered several site and uranium source alternatives to fulfill domestic enrichment needs, and compared these alternatives to the proposed activity at the ACP.[298]

Based on the statements provided by the NRC Staff in the FEIS, the Board finds that Section 102(2)(E) of NEPA has been complied with in this proceeding.

4. Compliance With 10 C.F.R. Part 51

10 C.F.R. Part 51 contains the regulations that have been implemented by the Commission to ensure compliance with NEPA. Compliance with this Part has been demonstrated in the Board's finding that NRC Staff's review has been adequate in meeting the requirements of Sections 102(2)(A), (C), and (E) as discussed above.

D. Independent Consideration Of The Final Balance Among Conflicting Factors

The Commission has directed that the Board independently consider the final balance among conflicting factors in the record (10 C.F.R. §§ 2.104(b)(3)(ii), 70.23(a)(7)).[299] As

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[296] FEIS at 2-35 to 2-36.

[297] See infra pp. 85-88.

[298] See FEIS at 2-36 to 2-49.

[299] From its inception in 1962 – pursuant to AEA section 191 – each Atomic Safety and Licensing Board has been an "independent" decisionmaker relative to the issues placed before it. Congress authorized the Commission to establish one or more licensing boards, largely, because it was believed that "with decisions being made by a semi-independent and technically qualified body, public confidence in the . . . regulatory process will be further enhanced." See S. Rep. No. S. Rep. No. 87-1677 (1962), as reprinted in 1962 U.S.C.C.A.N. 2207, 2214. Given (continued...)

previously mentioned, in the Board's view, the conflicting factors to be considered include: (1) the relative magnitude of the environmental impacts of the ACP as compared to other site locations, enrichment technologies, and DU conversion and disposal alternatives; (2) unavoidable adverse environmental impacts during construction and operation of the ACP and the mitigative actions proposed to minimize their effects; (3) potential cumulative impacts in the context of past, present, and future actions for both local (place-based) and national activities; (4) the magnitude of the irreversible and irretrievable commitments of resources; and (5) the relationship between short-term uses and long-term productivity of the human environment.

In its review of NEPA issues with respect to USEC's License Application, the Board reassessed the qualitative analysis prepared by the NRC Staff as the Board independently reviewed the Staff's categorization of the level of impact to each resource for both the proposed action and the no-action alternative. The NRC Staff's qualitative assessment is at the core of the items that the Board considered in our balancing among the conflicting factors and final determination of its final selection. As a result of our review, the Board finds that the Staff's assessment is well founded and reasonable, based on the discussion in the FEIS, as supplemented in those areas where the Board questioned the Staff's approach, assessment, or conclusions.

Summaries follow on the Board's independent assessment as applied to the NRC Staff's alternative analyses (including cost-benefit analysis), unavoidable adverse environmental impacts and their mitigative actions, potential cumulative impacts, irreversible

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[299](...continued)
the Panel's history, the members of each Licensing Board perform "independent" assessments of every record before them, and thus, the decisions of the Board are necessarily "independent" as well.

and irretrievable commitment of resources, and the relationship between short-term uses and long-term productivity of the human environment.

1. Alternatives Comparison

The Board independently reviewed the NRC Staff's comparisons of site location and technology alternatives with the relative magnitude of the environmental impacts from the construction and operation of the ACP at the Portsmouth facility. In so doing, the Board considered the following specific alternatives generated by the Staff: (1) no-action alternative as described above; (2) constructing and operating the ACP at Paducah; (3) constructing and operating the ACP at alternative locations on the Portsmouth site; (4) down-blending highly enriched uranium instead of constructing a domestic uranium enrichment plant; (5) using alternative sources of low-enriched uranium, including re-activating the GDP at the Portsmouth facility and purchasing additional low-enriched uranium from foreign sources; and (6) considering alternative technologies that are available for uranium enrichment (including the electromagnetic isotope separation process, liquid thermal diffusion, gaseous diffusion, atomic vapor laser isotope separation, and the separation of isotopes by laser excitation).[300] Alternative conversion and disposal methods for DU were discussed in HTE-2 (Impacts of DU Disposal).[301]

The Board's independent consideration of the alternatives analysis in the FEIS enabled us to conclude that the NRC Staff's assessment was reasonable and clearly based on a sound foundation for most of the factors. However, the Board questioned whether correct assessments had been assigned by the Staff in regards to the following factors: (1) whether

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[300] See FEIS at 2-36 to 2-49.

[301] See supra pp. 59-63.

locating operations at Paducah has a higher positive socioeconomic impact than at the Portsmouth facility; (2) why the management and handling of hydrofluoric acid is an extra burden if deconversion is performed at Paducah or at a fuel fabrication facility rather than at Portsmouth; (3) why the potential for additional domestic enrichment facilities being constructed in the future should be included in the no-action alternative; and (4) why the potential for additional domestic enrichment facilities had more impact on the no-action alternative than it did for the ACP with respect to the environment categories of Public and Occupational Health and of Waste Management.[302]

First, in regard to site alternatives, the NRC Staff testified that Paducah would have a higher socioeconomic impact relating to increased employment, because Paducah requires more construction activity than the Portsmouth facility.[303] Based on this explanation, the Board finds that the Paducah site does not offer any environmental advantage, and can properly be excluded from further consideration.

Second, the NRC Staff also testified that the management and handling of hydrofluoric acid will be required regardless of whether the DUF_6 deconversion occurs at the Portsmouth facility, at Paducah, or at an existing fuel fabrication facility.[304] As a result, the Staff's analysis performed for the FEIS appropriately did not consider the management and handling of hydrofluoric acid as an extra burden for the other facilities.[305] The Board finds that the impacts from the management and handling of DU was applied consistently for all alternatives in the

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[302] See February 6 Order at 20-21.

[303] See NRC Staff February 20 Response at 71; Tr. at 705.

[304] See NRC Staff February 20 Response at 72.

[305] See Tr. at 706.

FEIS.

Third, the NRC Staff testified that notwithstanding construction of the ACP, the need for a domestic source of low-enriched uranium will still exist and could be satisfied by licensing other domestic enrichment facilities in the future.[306] The Board finds that it was reasonable and appropriate for the Staff to consider future domestic licensing facilities for the no-action alternative since the need for domestic supplies will be reduced, or possibly eliminated, with the licensing of the ACP.

Fourth, as explained in HTE-4 (Final Balance Among Conflicting Factors),[307] the Board finds that the noted misprint on Table 2-8 did not affect the NRC Staff's conclusions in the FEIS (which was based on the correct impact assessment described in Chapter 4) and, as a result, has no bearing on the Staff's recommendation that the proposed license for the ACP be issued to USEC.

As to whether there will be an improvement of national security with the supplemental domestic supply of EU provided by the ACP, the NRC Staff testified that the conclusions in the FEIS would not likely change if all of the ACP product was sold to foreign markets.[308] Even though the majority of the capacity is replacing existing EU output at Paducah and there is no guarantee that any of the EU produced by the ACP will be used to fulfill domestic needs, the Board finds that it is reasonable for the Staff to conclude that national energy security is inherently improved by the increased domestic supplies of economically viable EU provided by the ACP.

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[306] See NRC Staff February 20 Response at 73.

[307] See supra pp. 64-66.

[308] See Tr. at 696, 747.

As part of the alternatives analysis, the NRC Staff estimated and evaluated the costs and benefits of the proposed action in Chapter 7 of the FEIS. Direct costs will result from the life-cycle stages of the facility, which includes: site preparation and construction, centrifuge manufacturing and assembly, operations, disposal of tails, and decontamination and decommissioning. Indirect costs identified and reviewed included environmental impacts expected to be caused by the proposed action, which, as stated above, were found to be generally SMALL but occasionally MODERATE.[309] The primary benefit of the proposed action is the annual production of 3.5 million to 7 million SWU of EU over the operational life of the ACP, at approximately 20 percent of the operating costs per SWU of a GDP. This production will augment the domestic supply of EU and will meet the purpose and need of the facility as discussed above. The Staff also determined that the proposed action will result in a socioeconomic impact on the region around the facility.[310] Overall, the Staff estimated that the costs of the proposed action will be SMALL in comparison to the benefits for the proposed action.[311]

As presented herein and discussed further in HTE-6 (Cost-Benefit Analysis),[312] the Board concluded, as a result of its independent assessment, that the construction and operation of the ACP yields significant net positive benefits.

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[309] See FEIS at 7-1 to 7-2.

[310] See id. at 7-5.

[311] See id.

[312] See supra pp. 70-74.

2. Unavoidable Adverse Environmental Impacts

Unavoidable adverse environmental impacts during construction and operation of the ACP, as presented in Chapter 4 of the FEIS and discussed further in Chapter 8, generally will be SMALL and will, in most cases, be mitigated by methods described in Chapter 5 of the FEIS. In its independent assessment, the Board questioned how the mitigation measures proposed by USEC and the one measure proposed by the NRC Staff, as summarized in Chapter 5 of the FEIS, will be incorporated into the license and how they will be implemented, monitored, and evaluated during construction and operations.[313] The Staff testified that license application documents, including the ER, will be directly incorporated into the license by tie-down references.[314] Monitoring and evaluation will be performed through Staff inspections.[315] The Staff verified that this tie-down procedure will include the options to mitigate adverse environmental impacts as presented in Tables 5-1, 5-2, and 5-3 of the FEIS.[316]

The Board finds that the unavoidable adverse environmental impacts have been adequately documented in the FEIS, the NRC Staff has a sound basis to state that the majority of these impacts will be SMALL and that the remainder will be SMALL to MODERATE, and the measures proposed by USEC and the Staff will help mitigate these impacts. Based upon the Staff's testimony, the Board also finds that the mitigation measures presented in the ER are appropriate and adequate, and will be incorporated into the License by tie-down references and monitored through Staff inspections.

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[313] See February 6 Order at 22.

[314] See NRC Staff WDT/HTS-3 at 5-7.

[315] See NRC Staff February 20 Response at 69.

[316] See id.; see also FEIS at 5-2 to 5-4.

3. Cumulative Impacts

In Section 4.3 of the FEIS, the NRC Staff evaluated the potential cumulative impacts resulting from the construction, operation, and decommissioning of the ACP in context of past, present, and foreseeable future actions at the Portsmouth facility that can result from individually minor but collectively significant actions taking place over a period of time. The affected environment presented in the Chapter 3 of the FEIS presents the baseline conditions against which the cumulative impacts were reviewed.

The past actions on the various resources and the identified trends in development and farming, for instance, that could influence various resources, were considered in evaluating cumulative impacts. Other federal and non-federal activities were reviewed on a place-based perspective, and several activities occurring at the Portsmouth facility, as well as national activities, were identified and considered in the cumulative impact analysis. The cumulative impacts by resource for the proposed ACP are documented in Table 4-24 of the FEIS and discussed by resource in the subsequent sections.[317] The cumulative impacts of the no-action alternative would be less than the proposed action except for socioeconomic impacts, as there would be fewer jobs created under the no-action alternative.[318]

The Board finds that the cumulative impacts for the ACP have been well defined in the FEIS and based on reasonable and appropriate analyses. In its independent review of the record of this proceeding, the Board finds that there is nothing illogical about the NRC Staff's assessment of cumulative impacts, that the facts in the record support the NRC Staff's conclusions, and we concur with the Staff's conclusions.

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[317] FEIS at 4-100 to 4-101, 4-103 to 4-114.

[318] See id. at 4-114 to 4-119.

4. Irreversible And Irretrievable Commitment Of Resources

The irreversible and irretrievable commitment of resources associated with the proposed ACP, as documented in Section 8.3 of the FEIS, includes the commitment of land, water, energy, raw materials, and other resources for the construction and operation of the facility. Many of the ACP buildings will be refurbished existing structures at the Portsmouth facility on land already committed to industrial purposes. Land adjacent to these structures will be used to build two additional process buildings and associated support structures including new roads and parking lots and several new cylinder storage yards. Other environmental resource usage is summarized in FEIS Section 8.3, including water use, energy use, waste generation, and material use for construction and operations.

In its independent assessment, the Board finds that the NRC Staff's analysis of irreversible and irretrievable commitment of resources is reasonable and appropriate for meeting the requirements of 10 C.F.R. Part 51, and we concur with the Staff's conclusions.

5. Short-Term Uses And Long-Term Productivity

As documented by the NRC Staff in Section 8.2 of the FEIS, the construction and operation of the proposed ACP will involve the short-term commitment of resources, including the permanent commitment of land, water, electricity, fuel, and other raw materials for construction. The short-term uses are offset by the long-term socioeconomic benefits to the local area and the region through continued and increased employment and expenditures. The Staff pointed out that investments in dependent businesses in the local area and region will provide further socioeconomic benefits.[319]

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[319] See id. at 8-4.

In its independent assessment, the Board finds that the NRC Staff has defined the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. The Board finds that the description in the record of the short-term uses and resulting long-term socioeconomic benefits to the local area and region address the NEPA requirements as promulgated in NRC regulations.

E. Determination Of Actions On The ACP Application To Protect Environmental Values

As discussed above, the Board is tasked with determining whether the requirements of NEPA and 10 C.F.R. Part 51 have been met, and independently considering the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken. Based on the discussion herein and in hearing topics HTE-1 through HTE-6,[320] the Board finds, as a result of its independent assessment, that the NRC Staff's review pursuant to 10 C.F.R. Part 51 has been adequate. The Board also finds that: (1) the requirements of NEPA Sections 102(2)(A), (C), (E), and 10 C.F.R. Part 51 have been complied with in this proceeding; (2) its independent consideration of the final balance among the conflicting factors contained in the record of this proceeding supports the issuance of the ACP License; and (3) after considering reasonable alternatives, protection of the environment does not require denial or further conditioning of the ACP License. The Board concludes that these factors support the granting of the ACP License.

[320] See supra pp. 56-74.

VI. CONCLUSION

The Board has reviewed the record in this proceeding, including the final SER, the FEIS, NRC Staff and USEC answers to questions propounded by the Board, the written direct testimony and documentary evidence submitted by the Staff and USEC with respect to the topics on which the Board requested additional information, and the testimony of the Staff and USEC witnesses given during the oral evidentiary hearing.

In our findings, consistent with Commission guidance,[321] we have relied upon, without independent verification, the accuracy and veracity of: (1) the content of the NRC Staff's documents, including the FEIS and the SER, and those of USEC as placed into the record of this proceeding; and (2) the Staff's and USEC's responses to the Board's inquiries and their written direct and in-person testimony at the oral portion of this proceeding. We have also, pursuant to Commission direction, relied upon the Staff's NEPA-related examination of the matters related to USEC's License Application, including its consideration of alternatives.

Subject to the commitments and assumptions specified in the thirteen proposed License Conditions, six exemption requests, and over 200 commitments, we have reached the following determinations.

With respect to matters involving safety, i.e., issues pursuant to the AEA, the Board has determined that: (1) the License Application and the record of this proceeding, as supplemented by the information provided to the Board during the course of its review, contain sufficient information to support the NRC Staff's conclusions; (2) the review of the Application by the NRC Staff has been adequate; (3) the issuance of the ACP License will not be inimical to the common defense and security or to the health and safety of the public; and (4) the

[321] See CLI-05-17, 62 NRC 5.

proposed ACP can be constructed and operated without undue risk to the health and safety of the public.[322]

With respect to matters involving the environment, i.e., issues arising under NEPA, the Board has determined that the review conducted by the NRC Staff has been adequate. In addition, the Board finds that: (1) the requirements of Sections 102(2)(A), (C), and (E) of NEPA and 10 C.F.R. Part 51 have been complied with in this proceeding; (2) having conducted its own independent balancing of the conflicting environmental and other factors, including examination of the costs and benefits of the proposed facility, the overall balance supports issuance of the ACP License; and (3) after considering reasonable alternatives, protection of the environment does not require denial or further conditioning of the license.[323] Therefore, the Board concludes that these items support issuance of the requested License.

[322] See 10 C.F.R. § 2.104(b)(2)(i); 69 Fed. Reg. at 61,411.

[323] See 10 C.F.R. § 2.104(b)(2)(ii), (3); 69 Fed. Reg. at 61,411.

For the foregoing reasons, it is ORDERED that the Director, Office of Nuclear Material Safety and Safeguards is authorized to issue to USEC a thirty-year License to construct and operate the ACP, consistent with the Atomic Energy Act of 1954, Commission regulations, and this Initial Decision.[324]

It is so ORDERED.

THE ATOMIC SAFETY
AND LICENSING BOARD[325]

/RA/

Lawrence G. McDade, Chairman
ADMINISTRATIVE JUDGE

/RA/

Dr. Peter S. Lam
ADMINISTRATIVE JUDGE

/RA/

Dr. Richard E. Wardwell
ADMINISTRATIVE JUDGE

Rockville, Maryland
April 13, 2007

[324] See 10 C.F.R. § 2.340.

[325] Copies of this Initial Decision were sent this date to (1) Counsel for the NRC Staff and (2) Counsel for USEC.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
USEC Inc.	)	Docket No. 70-7004-ML
	)	
	)	
(American Centrifuge Plant)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB MEMORANDUM AND ORDER (ISSUANCE OF REDACTED INITIAL DECISION) have been served upon the following persons by U.S. mail, first class, or through NRC internal distribution.

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Dated at Rockville, Maryland,
this 24th day of April 2007