

March 3, 2006

G. Paul Bollwerk
Administrative Judge
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Paul Abramson
Administrative Judge
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In the Matter of
LOUISIANA ENERGY SERVICES, L.P.
(National Enrichment Facility)
Docket No. 70-3103-ML

Dear Administrative Judges:

In accordance with the Board's March 2, 2006 Order, the following documents are attached: (1) the Staff's Prefiled Hearing Exhibit List, with reference to Staff Exhibit 60-M removed; and (2) the "Revised NRC Staff Pre-Filed Mandatory Hearing Testimony Concerning the Purpose and Need Statement in the Final Environmental Impact Statement for the Proposed National Enrichment Facility," in which references to Staff Exhibit 60-M have been replaced with references to Staff Exhibit 47. The Staff apologizes for any inconvenience.

Sincerely,

/RA/

Margaret J. Bupp
Counsel for NRC Staff

Attachments: As Stated

cc w/Atts: James Curtis, Esq.
Rod Krich
Office of the Secretary
ATTN: Rulemaking and Adjudications Staff
Office of Commission Appellate Adjudication

Louisiana Energy Services, L.P., Docket No. 70-3103-ML
March 2006 Mandatory Hearing on Uncontested Issues
Prefiled Hearing Exhibits

Party Exh. #	Witness/ Panel	Description
Staff 49-M	Safety Evaluation Report	NUREG-1827, "Safety Evaluation Report for the Proposed National Enrichment Facility in Lea County, New Mexico," (2005)
Staff 50-M	Standard Review Plan	"Louisiana Energy Services National Enrichment Facility Safety Evaluation Report Executive Summary," (Sept. 16, 2005). [PROPRIETARY]
Staff 51-M	Standard Review Plan	NUREG-1520, "Standard Review Plan for Review of License Applications for Fuel Cycle Facilities," (2002).
Staff 52-M	Decommissioning Funding	SECY-03-0161, "2003 Annual Update - Status of Decommissioning Program," (Sept. 15, 2003).
Staff 53-M	Decommissioning Funding	NUREG-0586, "Draft Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," (1981).
Staff 54-M	Decommissioning Funding	NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," (1988).
Staff 55-M	Decommissioning Funding	NUREG-0584, "Assuring the Availability of Funds for Decommissioning Nuclear Facilities," (1982).
Staff 56-M	Decommissioning Funding	NUREG-CR-1481, "Financing Strategies for Nuclear Power Plant Decommissioning," (1980).
Staff 57-M	Decommissioning Funding	57 Fed. Reg. 30,383-30,387 (July 9, 1992)

Party Exh. #	Witness/ Panel	Description
Staff 58-M	Criticality	"National Enrichment Facility Integrated Safety Analysis Summary," (2004).
Staff 59-M	Criticality	Interim Staff Guidance (ISG)-03, "Nuclear Criticality Safety Performance Requirements and Double Contingency Principle," (Feb. 17, 2005).
Staff 61-M	FEIS Purpose and Need	Louisiana Energy Services Environmental Report, Section 1.0, "Purpose and Need for the Proposed Action," (2004).
Staff 62-M	FEIS Purpose and Need	Council on Environmental Quality Regulations, 40 CFR 1500.1 and 1502.13.
Staff 63-M	FEIS Purpose and Need	Natural Resources Conservation Service, U.S. Dept. of Agriculture, "Writing a Purpose and Need Statement," (2003).
Staff 64-M	FEIS Purpose and Need	Letter from J.L. Connaughton, Executive Director, Council on Environmental Quality, to N.Y. Mineta, Secretary, U.S. Dept. of Transportation (May 12, 2003).
Staff 65-M	FEIS Purpose and Need	Maeda, H. 2005. "The Global Nuclear Fuel Market – Supply and Demand 2005-2030: WNA Market Report", World Nuclear Association Annual Symposium
Staff 66-M	FEIS Purpose and Need	Combs, J. 2004. "Fueling the Future: A New Paradigm Assuring Uranium Supplies in an Abnormal Market", World Nuclear Association Annual Symposium
Staff 67-M	FEIS Purpose and Need	Cornell, J. 2005. Secondary Supplies: Future Friend or Foe?, World Nuclear Association Annual Symposium
Staff 68-M	FEIS Purpose and Need	Van Namen, R. (2005) "Uranium Enrichment: Contributing to the Growth of Nuclear Energy", USEC Presentation to Platts Nuclear Fuel Strategies Conference.

Party Exh. #	Witness/ Panel	Description
Staff 69-M	FEIS Purpose and Need	Euratom (2005) "Analysis of the Nuclear Fuel Availability at EU Level from a Security of Supply Perspective", Euratom Supply Agency – Advisory Committee Task Force on Security of Supply.
Staff 70-M	FEIS Purpose and Need	International Energy Outlook (2000-2005)
Staff 73-M	FEIS Purpose and Need	U.S. Dept. of Energy, "The Global Nuclear Energy Partnership," (2006), available at http://www.gnep.energy.gov/default.html .
Staff 74-M	FEIS Purpose and Need	U.S. Dept. of Energy, "GNEP Element: Expand Domestic Use of Nuclear Power," (2006), available at http://www.gnep.energy.gov/pdfs/06-GA50035c_2-col.pdf .
Staff 75-M	FEIS Purpose and Need	U.S. Dept. of Energy, "GNEP Element: Establish Reliable Fuel Services," (2006), available at http://www.gnep.energy.gov/pdfs/06-GA50035g_2-col.pdf .

March 3, 2006

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
LOUISIANA ENERGY SERVICES, L.P.)	Docket No. 70-3103
)	
(National Enrichment Facility))	ASLBP No. 04-826-01-ML
)	

REVISED NRC STAFF PRE-FILED MANDATORY HEARING TESTIMONY CONCERNING
THE PURPOSE AND NEED STATEMENT IN THE FINAL ENVIRONMENTAL IMPACT
STATEMENT FOR THE PROPOSED NATIONAL ENRICHMENT FACILITY

Q.1. Please state your name, occupation, by whom you are employed and your professional qualifications.

A.1. (JP) James Park. I am the NRC Project Manager for the environmental review of Louisiana Energy Services' (LES's) application to construct and operate the proposed National Enrichment Facility (NEF). A statement of my professional qualifications is attached.

A.1. (RN) Rick Nevin. I am employed as a consultant by ICF Consulting. I am providing this testimony under a technical assistance contract with the NRC. A statement of my professional qualifications is attached.

Q.2. Please describe your professional responsibilities with regard to the NRC Staff's preparation of an environmental impact statement for the NEF.

A.2. (JP) I was responsible for overseeing the preparation of NUREG-1790, the "Environmental impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico: Final Report" June 2005, (FEIS), Staff Exhibit 47, including the portions relevant to the current proceeding, Chapters 1, 2, 4, and 7 ("Purpose and Need for the Proposed Action," "Alternatives," "Environmental Impacts," and "Cost Benefit Analysis").

A.2. (RN) I have assisted the NRC in preparing a supplemental purpose and need analysis for the environmental review of the proposed National Enrichment Facility which is the subject of a pending license application from Louisiana Energy Services, L.P.

Q.3. Have you previously provided testimony in the proceeding concerning the licensing application for the NEF?

A.3. (JP) Yes. With other members of the Staff, I provided testimony on contention EC-6/TC-3, as supported by Basis (I), in the October 24-27, 2005 portion of the contested hearing. The purpose of that testimony was to provide the NRC Staff's views concerning the admitted contention regarding the plausibility of LES's proposal to dispose of the triuranium octaoxide (U_3O_8) produced by the deconversion process.

A.3. (RN) Yes. I provided testimony on contention EC-7 in the February 7-10, 2005 portion of the contested hearing. The purpose of that testimony was to provide the Staff's views concerning the admitted contention regarding the adequacy of the discussion of the need for the proposed NEF in LES's Environmental Report and in the Staff's Draft Environmental Impact Statement (DEIS). My testimony in that proceeding included an evaluation of LES's analysis of supply and demand for enrichment services.

Q.4. Was the purpose of Mr. Nevin's previous testimony to supplement the record regarding the Staff's environmental review of the proposed NEF?

A.4. (JP) Yes. The testimony from Rick Nevin regarding the market for enrichment services world wide, supplemented the analysis provided in the DEIS on the purpose and need for the proposed facility.

Q.5. What is the purpose of this testimony?

A.5. (JP, RN) The purpose of this testimony is to address the Board's concern, as addressed in the January 30, 2006, Order that:

The purpose and need statement in section 1.3 of the staff's Final Environmental Impact Statement (FEIS) for the NEF is insufficient. The approach taken by LES in section 1.1 of its Environmental Report (ER) is adequate; however, it is not sufficient for the staff simply to rely upon the analysis done by LES. The Board requests that the staff make a presentation addressing the topics covered by LES in section 1.1 of the ER, indicating with specificity whether and why it agrees with that presentation.

Q.6. How have you addressed this concern?

A.6. (JP, RN) By conducting an independent analysis, which is attached to this testimony, addressing the elements of the purpose and need statement contained in the LES's environmental report. Staff Exhibit 61-M.

Q.7. What is the Staff's understanding of the purpose and scope of the "purpose and need" discussion in the Environmental Impact Statement to comply with the National Environmental Policy Act (NEPA)?

A.7. (JP) The NRC Staff prepared its FEIS on the proposed National Enrichment Facility (NEF) in accordance with its understanding of the requirements of NEPA and the NRC's implementing regulations found in 10 CFR Part 51. Staff Exhibit 47, p. 1-10. Regarding the purpose and need for the proposed facility, the Staff determined that the proposed NEF would satisfy the need for an additional reliable and economical domestic source of uranium enrichment services. Staff Exhibit 47, pp. 1-2, 7-1. In doing so, the proposed NEF would also contribute to the attainment of the Administration's stated national energy security policy objective to expand nuclear energy dependence. *Id.* The Staff premised this determination on an evaluation of the supply and demand for enrichment services within the United States and globally.

There is no requirement in NEPA that an agency must make an independent

assessment of the “purpose and need” for the action under review. However, the agency must define the general goal of the proposed action in order to ascertain the alternatives which must be considered to satisfy the NEPA requirement that the agency evaluate alternatives which would accomplish the goals of the proposed action. Thus, under 10 CFR Part 51, appendix A, an environmental impact statement (EIS) is to “briefly describe and specify the need for the proposed action.” Further guidance on the purpose of the Need statement in an EIS is provided in the Council on Environmental Quality’s (CEQ’s) regulations under 40 CFR Part 1500, Staff Exhibit 62-M. The CEQ regulations implement the provisions of section 102(2) of NEPA, which “contains ‘action-forcing’ provisions to make sure that federal agencies act according to the letter and spirit of the Act.” 40 CFR 1500.1. 40 CFR 1502.13, “Purpose and need,” states that an EIS “shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” Alternatives identification and evaluation is “the heart” of the EIS. 10 CFR 51, appendix A. Thus, the Need statement “defines the range of reasonable alternatives to be considered in an environmental document.” Natural Resources Conservation Service, U.S. Department of Agriculture, "Writing a Purpose and Need Statement", January 26, 2004, Staff Exhibit 63-M.

Q.8. Please briefly describe the Staff’s evaluation of the “purpose and need” for the proposed NEF in the final environmental impact statement (FEIS).

A.8. (JP) In the Staff’s FEIS, the purpose and need for the proposed NEF is addressed in section 1.3. Staff Exhibit 47, pp. 1-2 to 1-5. As identified previously, the Staff states that “an additional reliable and economical domestic source of enrichment services” is the need for the proposed NEF. *Id.* at 1-2. Additionally, the Staff states that the proposed NEF “would contribute to the attainment of the national energy security policy objectives.” Staff *Id.* at 1-2. In support of this identified need, the Staff in the FEIS provides background on and a

description of the current and projected domestic supply and demand for uranium enrichment services, as well as discussion of global supply and demand issues. *Id.* at 1-3 to 1-5. The Staff compared projections of uranium enrichment demand prepared by LES and by the Energy Information Administration (EIA) to find that both forecasts indicated a need for additional uranium enrichment capability to ensure national energy security. *Id.* at 1-4. In addition, the Staff noted that the proposed NEF would provide roughly 25 percent of current and projected U.S. enrichment services demand. *Id.* at 1-5. Furthermore, the Staff states that the U.S. market for enrichment services would be especially vulnerable to any unforeseen global supply shortfall if the gaseous diffusion plant in Paducah, KY closes, as expected, without an offsetting increase in supply from the combined output of the American Centrifuge Plant proposed by the USEC, Inc. (USEC) and the proposed NEF. *Id.* at 1-5. The Staff references LES's environmental report, EIA annual reports, various U.S. Department of Energy documents, USEC reports and releases, and other documents in support of this discussion on need for the proposed NEF. With respect to global supply and demand, the FEIS discussion is a summary of the analysis conducted by Mr. Nevin and presented previously at the February 7-10, 2005 portion of the contested hearing.

Based on the stated need for the proposed NEF, the Staff identified a range of alternatives that were evaluated in Chapter 2 of the Staff's FEIS. In accordance with 10 CFR Part 51, appendix A, the Staff first discussed the "no action" alternative, under which the proposed NEF would not be constructed. *Id.* at 2-33 to 2-34. The Staff evaluated the potential environmental impacts associated with this alternative and presented this analysis in section 4.8 of the FEIS. *Id.* at 4-78 to 4-82.

The Staff also identified and discussed other alternatives for providing reliable and economical domestic sources of enriched uranium. *Id.* at 2-39 to 2-42. These alternatives

included re-activating the Portsmouth Gaseous Diffusion Facility, purchasing low enriched uranium (LEU) from foreign sources, and employing various enrichment technologies such as: (1) the electromagnetic isotope separation process; (2) liquid thermal diffusion; (3) gaseous diffusion; and (4) laser separation technologies (atomic vapor laser isotope separation and separation of isotopes by laser excitation). The Staff determined that re-activation of the Portsmouth facility was not likely, and that reliance on foreign suppliers of LEU did not meet the need for domestic sources of enriched uranium; therefore, the Staff eliminated both of these alternatives from further consideration. *Id.* at 2-40.

Based on its evaluation of the alternative technologies to the gaseous centrifuge technology proposed by LES, the Staff determined that these technologies were either far more costly than the centrifuge technology or not yet sufficiently developed for commercial application. *Id.* at 2-42. Therefore, these technologies would not be able to provide reliable and economical domestic sources of enriched uranium, and so the Staff did not analyze these technologies further in the FEIS.

After weighing the impacts of the proposed action and comparing alternatives, the Staff concluded that the overall benefits of the proposed NEF outweighed the environmental disadvantages and costs, based in part on the need for an additional, reliable, economical, domestic source of enrichment services. *Id.* at 2-46.

Q.9. Is the discussion of purpose and need in the FEIS for the NEF consistent with the Staff's understanding of the requirements imposed by NEPA and with other environmental reviews conducted for other actions?

A.9. (JP) The Staff considers its discussion of the need for the proposed NEF is sufficient to meet the requirements under NEPA for such a discussion. Over four pages in the FEIS, the Staff has briefly described and specified the need for the proposed action. 10 CFR

Part 51, appendix A; 40 CFR 1502.13. The length of this discussion far exceeds the typical length for such discussions, “one or two paragraphs,” as stated in a letter from the Executive Director of the CEQ to the then Secretary of the Department of Transportation. Letter from J.L. Connaughton, Executive Director, Council on Environmental Quality, to N.Y. Mineta, Secretary, U.S. Dept. of Transp. (May 12, 2003), Staff Exhibit 64-M. Additionally and more importantly, the stated need for the proposed NEF (“an additional reliable and economical domestic source of uranium enrichment services”) is adequate to determine the alternatives to be considered in the Staff’s environmental evaluation. The evaluation of the alternatives, including the proposed NEF, is presented in the Staff’s FEIS. Nevertheless, to address the Board’s concern regarding the adequacy of the Staff’s analysis, the Staff, with the assistance of Rick Nevin, has developed an independent evaluation of the matters address in the ER in section 1.1. Following the format of the ER, the analysis includes an expanded discussion of the overall purpose and need for the proposed action and an independent and updated market analysis of enriched uranium. The analysis and supporting market analysis, which is presented in the format used in the FEIS, is attached.

Q.10. Does this conclude your testimony?

A.10. (JP, RN) Yes

Purpose and Need for the Proposed Action

The need for the proposed National Enrichment Facility (NEF) and the evaluation of alternative scenarios is based on the following related considerations:

- The need for global enrichment supply to satisfy global nuclear generating requirements;
- The need for economical, and secure supply of enriched uranium to fulfill U.S. electricity requirements;
- The need for domestic uranium enrichment to achieve energy security and national security goals

These considerations are discussed below, followed by an evaluation of the specific alternative scenarios considered in the LES Environmental Report (ER).

The need for global enrichment supply to satisfy global nuclear generating requirements

The NRC has compared several recent analyses of the global enrichment market (attached), including the forecast in the LES ER. This comparison indicates that the forecast in the LES ER for global enrichment demand was conservative relative to World Nuclear Association (WNA) forecasts and relative to more recent Energy Information Administration (EIA) forecasts for global nuclear generating capacity. Other forecasts anticipate a tight balance of global enrichment supply and demand and the risk of a supply shortfall after 2013 even if the proposed NEF and the proposed USEC, Inc. American Centrifuge Facility (ACP) are both providing enrichment services at *or beyond* their proposed licensed capacity, and with Russian supply equal to or surpassing the amount forecast by ERI related to an extension of the HEU agreement.

The need for an economical and secure supply of enriched uranium to fulfill U.S. electricity requirements

The NRC market analysis also finds that the forecast for uranium enrichment demand in the United States in the LES ER is consistent with the EIA forecast, and shows that the proposed licensed output of the NEF and ACP facilities combined would supply just over half of U.S. MOX-adjusted demand in 2020. Therefore, the risk of a global enrichment supply shortfall after 2013 poses a substantial risk to U.S. enrichment supply in particular, and a secure U.S. enrichment supply is essential because nuclear power plants currently supply 20% of U.S. electricity demand. The only enrichment facility currently operating in the U.S. is the Paducah gaseous diffusion plant, and USEC has announced it would cease production at the aging, energy-intensive Paducah facility as it begins production at the proposed ACP. The NEF would deploy new gas centrifuge technology that is both economical and modular, supplying the proposed licensed capacity, while also allowing capacity to be increased in response to future market demands. The ACP would also deploy gas centrifuge technology, and these two facilities would provide U.S. nuclear power plants with two economical, and secure domestic suppliers of enrichment services.

The need for domestic enrichment to achieve energy security and national security goals

The NEF EIS cites interagency discussions led by the National Security Council where there was a clear determination that the United States should maintain a viable domestic uranium enrichment industry for the foreseeable future. More recently, as part of President's Advanced Energy Initiative, the Department of Energy has announced plans to launch a Global Nuclear Energy Partnership (GNEP) to enable "expanded use of economical, carbon-free nuclear energy to meet growing electricity demand" by "having nations with secure, advanced nuclear capabilities provide fuel services - fresh fuel and recovery of used fuel - to other nations who agree to employ nuclear energy for power generation purposes only." (DOE, 2006a)

The first key element of the GNEP initiative to stimulate new U.S. nuclear plant construction through streamlined building and operating regulations, and by implementing incentives enacted by the Energy Policy Act of 2005: "Increasing the amount of electricity generated by nuclear power is critical to moving the nation toward a more sustainable and secure energy future." (DOE, 2006b) Another key element of GNEP is to advance the goals of nuclear nonproliferation by establishing "cradle-to-grave" fuel leasing by supplier nations, to provide an incentive for other nations to forgo enrichment and reprocessing technology that could be used to produce material for nuclear weapons. "To succeed as an incentive for nations to forgo the development of indigenous enrichment and reprocessing capabilities, the supply of reactor fuel must be reliable and available at competitive market prices." (DOE, 2006c)

Recent analyses of the global enrichment market, and the EIA and LES ER forecasts for the U.S. market, do not reflect any significant increase in the number of operating U.S. nuclear plants, so energy policy efforts to increase the amount of electricity from nuclear power could further increase the need for domestic uranium enrichment. Reliable U.S. enrichment supply is also clearly essential for the United States to credibly lead an international effort to ensure reliable enrichment supply to other nations to advance the goals of nonproliferation.

Alternative scenarios considered in the LES Environmental Report

The following market scenarios considered in the LES ER are evaluated in the context of the market and security considerations discussed above:

- Scenario A: NEF and ACP Are Built in the U.S.
- Scenario B: No NEF; USEC Deploys ACP and Continues to Operate Paducah diffusion facility
- Scenario C: No NEF; USEC Deploys ACP and Increases ACP Capacity
- Scenario D: No NEF; USEC Does Not Deploy ACP and Continues to Operate Paducah facility
- Scenario E: No NEF, Urenco Expands Centrifuge Capability in Europe
- Scenario F: No NEF; Russia Increases Sales of the HEU-Derived SWU
- Scenario G: No NEF; Russia is Allowed to Increase Commercial SWU Sales to Europe and U.S.
- Scenario H: No NEF; U.S. HEU-Derived LEU is Made Available to the Commercial Market

Scenarios B and D are not viable, based on USEC's intention to close the Paducah facility after the start up of the ACP. There is also a consensus across market forecasts that diffusion facilities are no longer economically competitive and will shut down by 2015.

Scenarios C, F, G, and H highlight possible sources of additional supply for the U.S. market, but several global market forecasts now anticipate a tight balance of supply and demand after 2013 even with increased Russian commercial sales to Europe and the U.S. *plus* the combined output of the ACP and NEF at *or above* their proposed licensed capacity. Each of the LES scenarios also assume that the current Russian HEU agreement will be renewed, which is not at all certain.

Recent market forecasts suggest that there will be a need for the proposed licensed capacity of both the ACP and NEF, and possibly additional capacity at one or both facilities, even if the HEU agreement is renewed and/or additional supply is provided by some combination of U.S. HEU derived LEU and/or increased Russian commercial SWU and/or Russian HEU sales. These forecasts suggest that additional centrifuge capacity will be built to satisfy enrichment demand, and the issue is whether new capacity is added in the United States (Scenarios A and/or C), in Europe (Scenario E), or elsewhere. The NRC agrees with the ER conclusion that Scenario A is the preferred scenario, especially in the context of energy security and national security considerations.

References:

DOE, 2006a. "The Global Nuclear Energy Partnership", accessed at: <http://www.gnep.energy.gov/default.html>, Staff Exhibit 73-M.

DOE, 2006b. "GNEP Element: Expand Domestic Use of Nuclear Power", accessed at: http://www.gnep.energy.gov/pdfs/06-GA50035c_2-col.pdf, Staff Exhibit 74-M.

DOE, 2006c. "GNEP Element: Establish Reliable Fuel Services", accessed at: http://www.gnep.energy.gov/pdfs/06-GA50035g_2-col.pdf, Staff Exhibit 75-M.

Market Analysis of Uranium Enrichment Supply and Demand

This analysis compares available global uranium enrichment supply and requirement (demand) forecasts, and forecasts for United States supply and demand, in order to evaluate the need for new enrichment capacity in the United States. The United States is a substantial net importer of enrichment services, but also exports to some foreign customers, so global trade in enrichment services provides important context for assessing the need for new U.S. enrichment capacity.

Several independent analyses indicate that global enrichment supply and demand will be in close balance with some risk of a supply shortfall after 2013, even if the United States proceeds with licensing two new centrifuge facilities: the proposed National Enrichment Facility (NEF) and the proposed American Centrifuge Plant (ACP). The areas of agreement between recent analyses, and the areas of uncertainty, are described below with respect to global demand, global supply and supply shortfall risk, and U.S. supply and demand.

Global Enrichment Demand

Enrichment requirements are driven by nuclear power demand for enriched uranium fuel, which is primarily a function of nuclear generating capacity. But demand is also affected by a trade-off between enrichment SWU prices and uranium prices. Combs (2004) notes that some utilities have recently used enrichment as a way to economize on uranium, reducing their tails assays as uranium prices have increased relative to SWU prices.

World Nuclear Association (WNA) and U.S. Energy Information Administration (EIA) forecasts for global nuclear generating capacity account for uncertainty by providing a range of estimates that gets larger over time, with a "reference case" (most likely) forecast near the middle of high and low case forecasts. These forecasts are updated with new information about plans to build reactors and/or cease operations at existing reactors, and changes to capacity factors at existing reactors. Even without a large change in operating reactors, generating capacity and enrichment demand can change substantially with changes to capacity factors. Combs (2004) notes that U.S. capacity factors rose almost 50% from 1989-2001, "resulting in the equivalent of 25 new 1000 MWe reactors coming on line, even though the number of operating reactors declined slightly." EIA reference forecasts for world nuclear generating capacity increased substantially over recent years, and the 2005 EIA reference forecast for 2020 is now slightly higher than their 2000 high case forecast for 2020, as shown in Figures 1 and 2. (IEO, 2000 - 2005)

In comparing global enrichment forecasts it is important to note the year of the forecast, and the subsequent rise in the EIA forecast for global nuclear generating capacity. Forecasts in the LES ER for global generating capacity and enrichment demand in 2020 were both very close to EIA 2003 forecasts, but below WNA 2003 forecasts. The EIA has not updated its global enrichment forecast but its 2005 forecast for nuclear generating capacity in 2020 is now close to the WNA forecast, and about 10% above EIA's 2004 generating capacity forecast. The 2003 WNA forecast for 2020 global enrichment demand was also about 10% above the EIA and LES ER forecasts, and WNA 2005 forecasts for global generating capacity and enrichment demand in 2020 are little changed from their 2003 forecasts (Maeda, 2005). Therefore, the convergence in nuclear generating capacity forecasts suggests that the WNA global enrichment demand forecast is now roughly consistent with the 2005 EIA world nuclear

generating forecast. Combs (2004) and Euratom (2005) note that a significant decline in average tails assays could also increase 2020 SWU demand by almost 10% above the WNA forecast, but this is not anticipated as the most likely scenario.

Global Enrichment Supply and Supply Shortfall Risk

There is general agreement across recent market analyses and commentaries with respect to the forecast enrichment supply from old gaseous diffusion plants and newer centrifuge facilities in Europe and the United States. But there is more uncertainty about supply from Russian and U.S. Highly Enriched Uranium (HEU) and Russian commercial SWU sales to the West.

Euratom (2005) anticipates that U.S. Enrichment Corporation (USEC) will maintain enrichment capacity of 5.5 million SWU per year through 2020 via existing diffusion and/or ACP centrifuge technology, but USEC plans to cease diffusion production as it begins annual ACP production of just 3.5 million SWU. (Van Namen, 2005) Other enrichment supply forecasts, by Cornell (2005), Combs (2004), and Nukem (2002), and in the LES ER, all anticipate that existing diffusion plants will be closed by around 2013. This expectation reflects the age of diffusion plants, their high costs relative to new centrifuge facilities, and the announced plans of diffusion plant operators. The forecast closure of diffusion plants is also consistent with a Department of Energy (DOE) Report to Congress that cited the need for advanced enrichment technology in the United States to replace “the void created by the inevitable cessation of all domestic gaseous diffusion enrichment operations.” (DOE, 2001)

Enrichment supply forecasts by Cornell (2005), Euratom (2005), and Combs (2004), and in the LES ER, also anticipate global additions to centrifuge capacity, including U.S. licensing of the National Enrichment Facility (NEF) and the American Centrifuge Plant (ACP). Cornell (2005) notes that the planned retirement of diffusion plants will remove 17-18 million SWU of capacity, and the 2013 expiration of the Russian HEU agreement would remove another 5.5 million SWU from the market. With about 14 million SWU firmly planned, including the ACP and NEF, this suggests a potential supply shortfall of about 8 million “Western” SWU. However, this overstates the shortfall relative to the current market, because part of the 17-18 million annual SWU of existing diffusion capacity has already been effectively removed from the market by economic and competitive conditions. The LES ER estimated 18.8 million SWU of current diffusion physical capability, but only 14.5 million of “economically competitive and usable capability” in 2003. Van Namen (2005) refers to “approximately 13 million SWU of gaseous diffusion capacity” in 2005 that will be “phased out between 2010 and 2015 and replaced with centrifuges”.

Cornell (2005) and Euratom (2005) suggest that a supply shortfall after 2013 could be filled by Russian commercial SWU sales to the West, currently restricted by the Russian Suspension Agreement. LES believes that a substantial portion of that potential Russian commercial supply is outside of specifications for use in U.S. nuclear plants and/or fully utilized by Russian tails enrichment. The LES ER anticipates that the HEU agreement will be renewed at roughly the same supply of 5.5 million SWU, but Euratom (2002) anticipates that a new US-Russian HEU Agreement “will unlikely assume a definite form anytime soon”.

Figures 3 and 4 show the supply and demand forecasts by Euratom (2002) and Cornell (2005), respectively. Both of these forecasts anticipate very close balance of supply and demand after 2013, even though both supply forecasts assume: (1) An increase in Russian commercial

supply that is actually larger than current supply under the HEU agreement; (2) licensing of both the NEF and ACP centrifuge facilities; and (3) USEC production at or above its current level of 5.5 million SWU, even though the ACP license application is only for 3.5 million SWU. Cornell (2005) also anticipates 2020 NEF output well above its license application for 3 million SWU. The LES ER also forecasts a tight balance of supply and demand after 2013 assuming: (1) A global demand forecast below more recent forecasts ; (2) continuation of the HEU agreement at current levels of 5.5 million SWU per year; and (3) licensing of both the NEF and ACP facilities at 3.0 and 3.5 million SWU per year, respectively.

In summary, there are a number of uncertainties associated with forecasting enrichment supply and demand to 2020 and beyond, but the consensus forecast is for a tight balance of supply and demand and the risk of a supply shortfall even if the ACP and NEF are producing at the capacity of their license applications, and with substantial Russian supply provided by an extension of the HEU agreement and/or Russian commercial production. Cornell (2005) notes that U.S. HEU could also help to fill the supply shortfall after 2013, but this would only delay the impact of any structural supply shortfall.

U.S. Enrichment Supply and Demand

Table 1 shows the EIA forecast for uranium enrichment requirements in the United States through 2025, and the LES ER forecast adjusted to take account of nuclear fuel comprised of a mixture of plutonium and uranium oxides, called MOX fuel. The EIA forecast shows a growth in demand to 14.2 million SWU in 2025. The LES ER forecast shows net enrichment demand of 11.4 million SWU in 2020, after adjusting for the anticipated supply of MOX fuel.

Table 1: Forecast U.S. Enrichment Demand through 2025 (Million SWU)

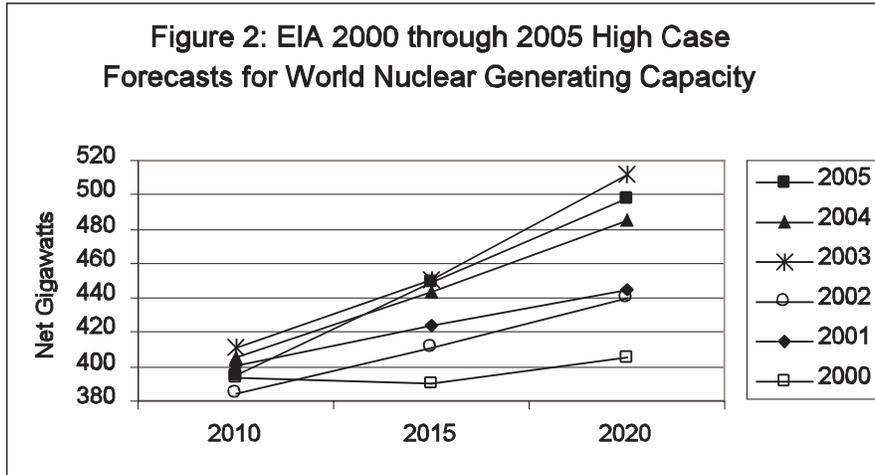
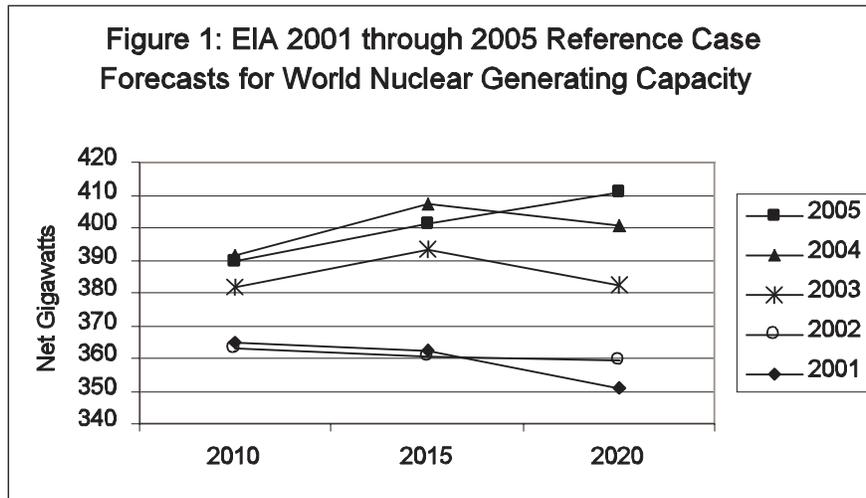
Year	EIA (2004)	LES ER MOX-Adjusted
2010	12.9	11.8
2015	15.4	11.4
2020	13.5	11.4
2025	14.2	N.A.

The proposed licensed output of the NEF and ACP centrifuge facilities would supply 6.5 million SWU per year, or just over half of U.S. MOX-adjusted demand in 2020. An extension of the Russian HEU agreement, other Russian supply, U.S. HEU supply, or additional production from the ACP and/or NEF (beyond proposed licensed capacity) will be needed to meet U.S. demand. Therefore, the risk of a global enrichment supply shortfall after 2013 poses a substantial risk to the United States market in particular. This market risk also entails energy security and national security risks, recognized by interagency discussions led by the National Security Council, where there was a clear determination that the United States should maintain a viable and competitive domestic uranium enrichment industry. (DOE, 2002) U.S. deployment of gas centrifuge technology, as planned for the proposed ACP and NEF, would address enrichment market risks, and associated energy and national security risks, not only by providing the supply proposed for immediate licensing, but also by deploying a technology that is both economical and modular, allowing production capacity to be increased in response to market demands.

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- Combs, J. 2004. "Fueling the Future: A New Paradigm Assuring Uranium Supplies in an Abnormal Market", World Nuclear Association Annual Symposium, Staff Exhibit 66-M.
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- Euratom (2005) "Analysis of the Nuclear Fuel Availability at EU Level from a Security of Supply Perspective", Euratom Supply Agency – Advisory Committee Task Force on Security of Supply, Staff Exhibit 69-M.
- International Energy Outlook (2000-2005), Staff Exhibit 70-M.
- EIA (2004) "Uranium Marketing Annual Report," available at <http://www.eia.doe.gov/cneaf/nuclear/page/forecast/projection.html>, NIRS/PC Exhibit 65.
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Figures for Market Analysis of Uranium Enrichment Supply and Demand



**Figure 3: Euratom (2005) Western Reactors SWU Demand and Supply¹
(Upper Supply Scenario; WNA Demand Scenario)**

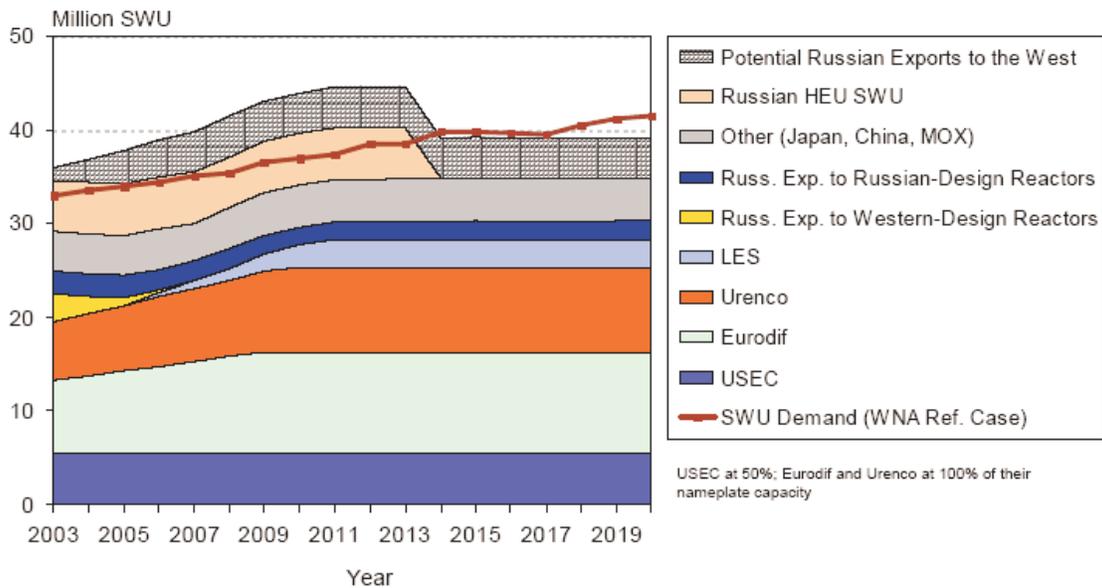
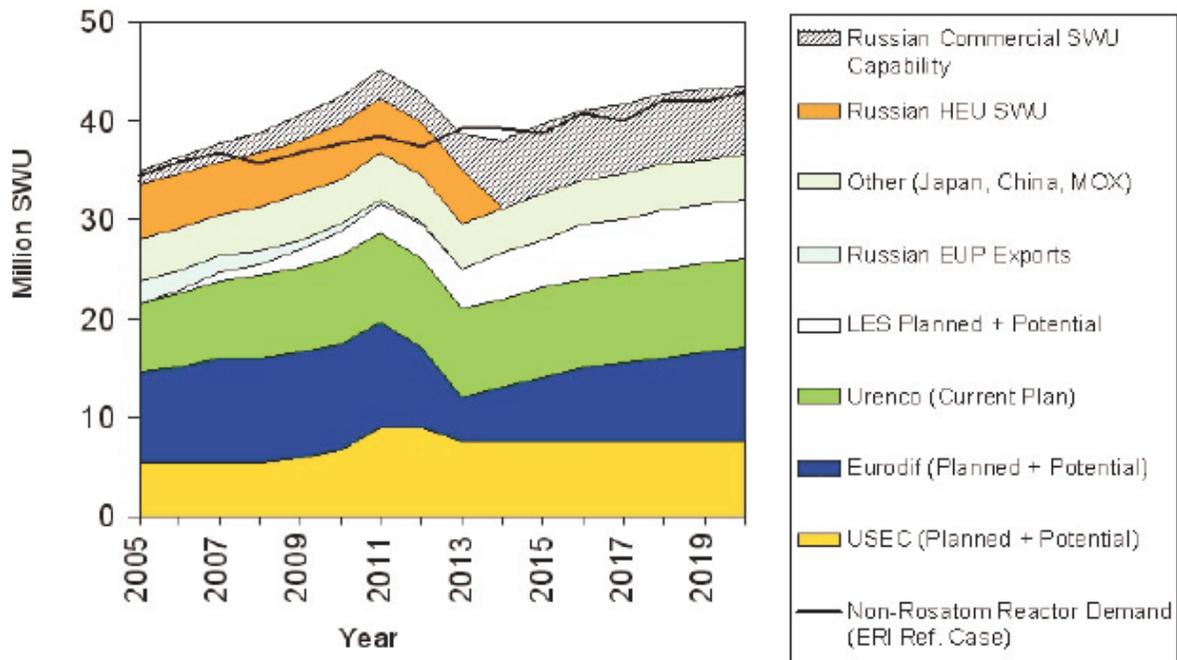


Figure 4: Cornell (2005) Enrichment Supply and Demand Forecast



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- Prepare and review environmental assessments and environmental impact statements on various aspects of the nuclear fuel cycle.

Project Manager

August 1994 - December 1998

- Interacted with federal and state governmental agencies, private companies, and members of the public on NRC actions related to the 10 Code of Federal Regulations (CFR) Part 40 licensing of active and inactive uranium mining sites
- Coordinated detailed interdisciplinary technical reviews of licensing actions proposed by 10 CFR Part 40 licensees and reporting of review findings in accordance with NRC policies
- Coordinated periodic meetings between the NRC, other federal and state governmental agencies, private companies, and members of the public on issues related to uranium recovery and site decommissioning
- Received extensive experience in word processing, graphics, and database software, and in Internet search and retrieval during the preparation of technical evaluation reports, environmental assessments, and environmental impact statements
- Received "Outstanding" rating in annual performance appraisals for the period of Fiscal Years 1996, 1997, and 1998

Systems Performance Analyst

June 1989 - August 1994

- Participated in the development of high-speed computer simulations of the long-term performance of the proposed 10 CFR Part 60 high-level waste repository at Yucca Mountain, Nevada
- Monitored several tasks related to scenario analysis on multi-million dollar contracts with the Center for Nuclear Waste Regulatory Analyses (CNWRA) and ensured final CNWRA products met specified technical requirements and schedule constraints
- Presented one paper at and was co-author on two other papers for the annual International High-Level Radioactive Waste Management (IHLRWM) Conference in 1994. Supported NRC preparations for 1990 - 1993 IHLRWM Conferences

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- Assisted in and developed activities for and visited with seniors at an assisted-living facility and in a day-care setting (September 2002 - April 2003)
- Assisted in and developed activities for Community Outreach Program for adults with developmental disabilities (September 2001 - April 2002)
- Judged entries for a Junior/Senior High School science fair (1997)

REFERENCES

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REFERENCES

Available upon request.

Louisiana Energy Services, L.P., Docket No. 70-3103-ML
March 2006 Mandatory Hearing on Uncontested Issues
Prefiled Hearing Exhibits

Party Exh. #	Witness/ Panel	Description
Staff 49-M	Safety Evaluation Report	NUREG-1827, "Safety Evaluation Report for the Proposed National Enrichment Facility in Lea County, New Mexico," (2005)
Staff 50-M	Standard Review Plan	"Louisiana Energy Services National Enrichment Facility Safety Evaluation Report Executive Summary," (Sept. 16, 2005). [PROPRIETARY]
Staff 51-M	Standard Review Plan	NUREG-1520, "Standard Review Plan for Review of License Applications for Fuel Cycle Facilities," (2002).
Staff 52-M	Decommissioning Funding	SECY-03-0161, "2003 Annual Update - Status of Decommissioning Program," (Sept. 15, 2003).
Staff 53-M	Decommissioning Funding	NUREG-0586, "Draft Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," (1981).
Staff 54-M	Decommissioning Funding	NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," (1988).
Staff 55-M	Decommissioning Funding	NUREG-0584, "Assuring the Availability of Funds for Decommissioning Nuclear Facilities," (1982).
Staff 56-M	Decommissioning Funding	NUREG-CR-1481, "Financing Strategies for Nuclear Power Plant Decommissioning," (1980).
Staff 57-M	Decommissioning Funding	57 Fed. Reg. 30,383-30,387 (July 9, 1992)

Party Exh. #	Witness/ Panel	Description
Staff 58-M	Criticality	"National Enrichment Facility Integrated Safety Analysis Summary," (2004).
Staff 59-M	Criticality	Interim Staff Guidance (ISG)-03, "Nuclear Criticality Safety Performance Requirements and Double Contingency Principle," (Feb. 17, 2005).
Staff 61-M	FEIS Purpose and Need	Louisiana Energy Services Environmental Report, Section 1.0, "Purpose and Need for the Proposed Action," (2004).
Staff 62-M	FEIS Purpose and Need	Council on Environmental Quality Regulations, 40 CFR 1500.1 and 1502.13.
Staff 63-M	FEIS Purpose and Need	Natural Resources Conservation Service, U.S. Dept. of Agriculture, "Writing a Purpose and Need Statement," (2003).
Staff 64-M	FEIS Purpose and Need	Letter from J.L. Connaughton, Executive Director, Council on Environmental Quality, to N.Y. Mineta, Secretary, U.S. Dept. of Transportation (May 12, 2003).
Staff 65-M	FEIS Purpose and Need	Maeda, H. 2005. "The Global Nuclear Fuel Market – Supply and Demand 2005-2030: WNA Market Report", World Nuclear Association Annual Symposium
Staff 66-M	FEIS Purpose and Need	Combs, J. 2004. "Fueling the Future: A New Paradigm Assuring Uranium Supplies in an Abnormal Market", World Nuclear Association Annual Symposium
Staff 67-M	FEIS Purpose and Need	Cornell, J. 2005. Secondary Supplies: Future Friend or Foe?, World Nuclear Association Annual Symposium
Staff 68-M	FEIS Purpose and Need	Van Namen, R. (2005) "Uranium Enrichment: Contributing to the Growth of Nuclear Energy", USEC Presentation to Platts Nuclear Fuel Strategies Conference.

Party Exh. #	Witness/ Panel	Description
Staff 69-M	FEIS Purpose and Need	Euratom (2005) "Analysis of the Nuclear Fuel Availability at EU Level from a Security of Supply Perspective", Euratom Supply Agency – Advisory Committee Task Force on Security of Supply.
Staff 70-M	FEIS Purpose and Need	International Energy Outlook (2000-2005)
Staff 73-M	FEIS Purpose and Need	U.S. Dept. of Energy, "The Global Nuclear Energy Partnership," (2006), available at http://www.gnep.energy.gov/default.html .
Staff 74-M	FEIS Purpose and Need	U.S. Dept. of Energy, "GNEP Element: Expand Domestic Use of Nuclear Power," (2006), available at http://www.gnep.energy.gov/pdfs/06-GA50035c_2-col.pdf .
Staff 75-M	FEIS Purpose and Need	U.S. Dept. of Energy, "GNEP Element: Establish Reliable Fuel Services," (2006), available at http://www.gnep.energy.gov/pdfs/06-GA50035g_2-col.pdf .