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January 7, 2005

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

Dear Administrative Judges:

Enclosed for filing in the above-referenced docket is the prefiled direct testimony of Louisiana Energy Services, L.P. ("LES") on NIRS/PC Contention EC-4. Hard copies have also been placed in U.S. First Class mail to the parties.

Yours sincerely,

James R. Curtiss

Enclosures
cc: See enclosed Certificate of Service

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SECY-02

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	Docket No. 70-3103-ML
	)	
Louisiana Energy Services, L.P.	)	ASLBP No. 04-826-01-ML
	)	
(National Enrichment Facility)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the "PREFILED TESTIMONY OF ROD M. KRICH ON BEHALF OF LOUISIANA ENERGY SERVICES, L.P. REGARDING CONTENTION NIRS/PC EC-4 ("IMPACTS OF WASTE STORAGE")" in the captioned proceeding have been served on the following by e-mail service, designated by **, on January 7, 2005 as shown below. Additional service has been made by deposit in the United States mail, first class, this 7th day of January 2005.

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January 7, 2005

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	Docket No. 70-3103-ML
Louisiana Energy Services, L.P.	)	
	)	ASLBP No. 04-826-01-ML
(National Enrichment Facility)	)	

PREFILED TESTIMONY OF ROD M. KRICH
ON BEHALF OF LOUISIANA ENERGY SERVICES, L.P.
REGARDING CONTENTION NIRS/PC EC-4 ("IMPACTS OF WASTE STORAGE")

I. WITNESS BACKGROUND

Rod M. Krich ("RMK")

Q1. Please state your name, occupation, and by whom you are employed.

A1. (RMK) My name is Rod M. Krich. I am Vice President of Licensing, Safety, and Nuclear Engineering for Louisiana Energy Services, L.P. ("LES"), the license application in this matter. I am presently "on loan" to LES from Exelon Nuclear, where I am Vice President Licensing Projects. As an Exelon employee, I also have assisted in the Yucca Mountain Project licensing effort, and served as the lead on strategic licensing issues related to the development of a new approach to licensing advanced reactors, such as the Pebble Bed Modular Reactor.

Q2. Please describe your current responsibilities.

A2. (RMK) I am responsible for leading the effort on behalf of LES to obtain a license from the U.S. Nuclear Regulatory Commission ("NRC"), as well as other necessary state and federal permits, to construct and operate the proposed National Enrichment Facility ("NEF"), a gas centrifuge enrichment facility that would be located in Lea County, New Mexico and provide

enrichment services to U.S. nuclear utilities. I also am responsible for implementing the Quality Assurance Program and ensuring that engineering products and services provided by contractors are of sufficiently high quality to be accepted by LES.

Q3. Please summarize your educational and professional qualifications.

A3. (RMK) I hold a B.S. in mechanical engineering from the New Jersey Institute of Technology and an M.S. in nuclear engineering from the University of Illinois. I have over 30 years of experience in the nuclear industry, covering engineering, licensing, and regulatory matters. This experience encompasses the design, licensing, and operation of nuclear facilities. A detailed statement of my professional qualifications is attached hereto.

Q4. Are you familiar with the proposed National Enrichment Facility ("NEF") and the operations that will take place there?

A4. (RMK) Yes.

Q5. What is the basis of your familiarity with the NEF?

A5. (RMK) As Vice President of Licensing, Safety, and Nuclear Engineering for LES, I have the overall responsibility for licensing and engineering matters related to the NEF project. In this capacity, I oversaw preparation and submittal of the NEF license application, as well as the engineering design of the facility processes and safety systems. As a result, I am very familiar with the NEF license application, and the NRC requirements and guidance related to the contents of such an application. Further, I serve as LES's lead contact with respect to matters related to the NRC Staff's review of the NEF license application. Finally, I am also responsible for the preparation of all state and federal permit applications related to the NEF.

II. RESPONSE TO NIRS/PC CONTENTION EC-4

Q6. What is the purpose of your testimony?

A6. (RMK) The purpose of my testimony is to discuss the manner in which LES addressed in its Environmental Report ("ER") the environmental impacts associated with the construction, operation, and decommissioning of a deconversion facility for the depleted uranium hexafluoride ("DUF_6") expected to be generated by the NEF. Specifically, I will discuss the basis for my conclusion that the ER appropriately evaluates the environmental impacts of a facility for the deconversion of depleted uranium hexafluoride generated by the NEF. I will also express an opinion on the appropriateness of NRC's reliance in its Draft Environmental Impact Statement ("DEIS") for the NEF on previous evaluations of the environmental impacts of a deconversion facility.

Q7. How much capacity will be required in a deconversion facility for the deconversion of the depleted UF_6 to be generated by the NEF?

A7. (RMK) Over the projected 30-year life of the NEF, the plant is conservatively estimated to generate 15,727 48Y cylinders of depleted uranium hexafluoride. Each cylinder will normally contain 12.5 MT (13.8 tons) of UF_6 or about 8.5 MTU (9.4 tons). Thus, we expect to generate 196,588 metric tons of depleted UF_6 or about 7,800 MT of DUF_6 per year. This is the capacity that would be required in a deconversion facility for processing the DUF_6 from the NEF.

Q8. Would you describe LES's plans for the deconversion of the DUF_6 to be generated by the NEF?

A8. (RMK) As set forth in the License Application, LES has identified two plausible strategies for the deconversion of DUF_6 from the NEF. Specifically, section 4.13.3.1.3 of the ER, entitled "Depleted UF_6 Disposition Alternatives", identifies a "preferred" plausible strategy that calls for the depleted UF_6 to be transported from the NEF to a private sector deconversion facility for deconversion of the depleted UF_6 to U_3O_8. Section 4.13.3.1.3 also identifies as plausible a strategy that calls for the depleted UF_6 to be transported from the NEF to a DOE

deconversion facility, either at Paducah, KY or Portsmouth, OH for the deconversion of the depleted UF_6 to U_3O_8.

Q9. With respect to the private sector option, have you identified a site for the location of this facility?

A9. (RMK) No, a site has not yet been identified. If we pursue the private sector option, that decision would be made at some future point, upon identification of the company selected to build the facility.

Q10. In the event that you elect to pursue the private sector option, have you identified a specific final form of the depleted uranium?

A10. (RMK) If we pursue the private sector option, it is our intent, as reflected in section 4.13.3.1.3 of the ER, to convert the DUF_6 to U_3O_8. We do not intend to convert the DUF_6 to UO2 or to a metal form.

Q11. What is the basis for your decision to convert the DUF_6 to U_3O_8?

A11. (RMK) The U_3O_8 form is recognized by the NRC as the more stable physicochemical form and the more compatible, as regards to safety, with the long-term disposition of tails (*See* LES Exhibit 19). In fact, NRC has recommended U_3O_8 as a waste form for long term storage and disposal, as it is thermodynamically stable and relatively insoluble (*See* LES Exhibit 20). DOE has also identified conversion to U_3O_8 as the preferred alternative in its Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride (DOE/EIS-0269) (April 1999) (*See* LES Exhibit 18).

Q12. In the event that you elect to pursue the private sector option, have you identified a specific conversion process for conversion of DUF_6 to U_3O_8?

A12. (RMK) No, we have not selected a specific process.

Q13. Have you determined whether the deconversion of DUF_6 to U_3O_8 would employ the process that results in anhydrous hydrofluoric acid ("HF") or either the Framatome or Cogema processes that result in aqueous HF?

A13. (RMK) No decision has been made as to which of these processes would be employed. In fact, the process to be employed would depend upon the specific company selected to build the facility and the process employed by that company.

Q14. Would you describe how the ER addresses the environmental impacts of a deconversion facility for the DUF_6 to be generated by the NEF?

A14. (RMK) The approach that we have taken is reflected in section 4.13.3.1 of the Environmental Report (*See* LES Exhibit 14), entitled "Radioactive and Mixed Waste Disposal Plans", which provides as follows:

"The environmental impact of a UF_6 conversion facility was previously evaluated generically for the Claiborne Enrichment Center (CEC) and is documented in Section 4.2.2.8 of the NRC Final Environmental Impact Statement (FEIS) (NRC, 1994a). After scaling to account for the increased capacity of the NEF compared to the CEC, this evaluation remains valid for NEF. In addition, the Department of Energy has recently issued FEISs (DOE, 2004a; DOE, 2004b) for the UF_6 conversion facilities to be constructed and operated at Paducah, KY and Portsmouth, OH. These FEISs consider the construction, operation, maintenance, and decontamination and decommissioning of the conversion facilities and are also valid evaluations for the NEF." (*See* LES Exhibit 14, p. 4.13-3)

This statement reflects a conclusion that I reached that the environmental impacts associated with the deconversion of depleted uranium hexafluoride had previously been evaluated thoroughly by the NRC and DOE, that these previous evaluations appropriately bound the impacts that might be associated with a private sector deconversion facility and, for these

reasons, it was appropriate to rely on those evaluations in the LES Environmental Report for the National Enrichment Facility. In addition, this statement is supported by the guidance in the Commission's Order of February 6, 2004, where the Commission said that "The NRC staff may consider the DOE EIS in preparing the staff's EIS."

Q15. Taking each of the environmental evaluations which are referred to in section 4.13.3.1 of the ER, beginning with the FEIS for the CEC (*See* LES Exhibit 15), could you explain why you believe it was appropriate to rely on this analysis in support of your conclusion that the environmental impacts associated with a private sector deconversion facility have been appropriately addressed?

A15. (RMK) Yes. In the case of NRC's FEIS for the CEC facility, that analysis addressed the environmental impacts of a deconversion facility in section 4.2.2.8, entitled "Radiological Impacts of DUF_6 Conversion and U_3O_8 Disposal" (*See* LES Exhibit 15), as well as in Appendix A, entitled "Assessment of the Environmental Impacts of Depleted UF_6 Disposition" (*See* LES Exhibit 15). The analysis performed by the NRC assumed a representative deconversion site and plant, with a population surrounding the plant of approximately 400,000 people (*See* LES Exhibit 15, Section A.1.1, p. A-2). The capacity of the deconversion plant analyzed by the staff was assumed to be 5,700 metric tons of UF_6 per year (*See* LES Exhibit 15, Section A.1.1, p. A-2). The staff's analysis estimated release rates of uranium to the atmosphere and surface water and estimated dose to the maximally exposed adult and to the critical individual (assumed to be an infant located at the nearest residence, which was assumed to be 0.5 km or 0.31 mile from the CEC facility) (*See* LES Exhibit 15, Section A.1.4, pp. A-4-5). The analysis also considered direct and skyshine radiation from cylinders stored at the conversion site (*See* LES Exhibit 15, Section A.1.4, p. A-6). Based upon this analysis, the staff concluded that for both the maximally exposed individual and the surrounding population, the exposures would be only a small fraction

of both background radiation and applicable limits, including the limits specified in 10 CFR Part 20 (100 mrem per year limit for releases related to routine operations), 40 CFR Part 61 (limit of 10 mrem per year annual effective dose equivalent), and 40 CFR Part 190 (25 mrem limit for routine releases to the general environment). Specifically, the staff found that the total effective dose equivalent, or "TEDE" (accounting for atmospheric, liquid, and direct pathways) for a deconversion facility was estimated to be 2.6 mrem, while the maximum annual tissue TEDE was estimated to be 2.9 mrem to the thyroid, both of which are significantly lower than the applicable regulatory limits and background radiation (*See* LES Exhibit 15, Section A.1.5, p. A-6). On this basis, the staff concluded that "operation of the DUF_6 conversion plant is expected to have negligible radiological impacts on the environment" (*See* LES Exhibit 15, Section A.1.5, pp. A-6-7). The CEC FEIS also considered both the radiological and nonradiological impacts of transportation associated with the transport of radioactive materials, concluding that the radiological impacts were well within regulatory limits for workers and well below background levels for members of the public. Similarly, the NRC concluded that the nonradiological impacts were also small.

Q16. Section 4.13.3.1 of the LES ER (*See* LES Exhibit 14) indicates that the CEC analysis was "scaled" to account for the larger NEF. Would you explain how you "scaled" the FEIS for the Claiborne Enrichment Center to account for the capacity of the deconversion facility that will be required to support the NEF?

A16. (RMK) The evaluation of the environmental impact of a deconversion facility performed for the CEC was based upon a deconversion facility that would process 5,700 MT DUF_6 per year, compared to a deconversion facility for the NEF project that would need to process approximately 7,800 MT DUF_6 per year. On this basis, if you assumed conservatively that the calculated doses in the CEC FEIS were doubled to account for the larger NEF plant -- a

conservative assumption in view of the fact that DUF_6 generated by the NEF will be approximately 37 percent more than the plant assumed in the CEC analysis -- the environmental impacts of such a deconversion facility would still be small and well within regulatory limits (*i.e.*, 5.2 mrem total effective dose equivalent, 5.9 mrem effective dose equivalent to the thyroid).

Q17. The statement that you referenced from section 4.13.3.1 of the Environmental Report indicates that you also relied on the FEISs published by DOE related to the environmental impacts of a deconversion facility. Would you explain what you relied on in these FEISs in reaching your conclusion that the ER appropriately evaluates the environmental impacts of a facility for the deconversion of the DUF_6 to be generated by the NEF?

A17. (RMK) DOE has published FEISs which address the environmental impacts of deconversion facilities to be constructed and operated at two specific sites, Portsmouth, OH ("Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth, Ohio Site") (*See* LES Exhibit 16) and Paducah, KY ("Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Paducah Kentucky Site") (*See* LES Exhibit 17). Each of these site-specific EISs in turn explicitly incorporates by reference the "Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride" ("PEIS") published by DOE in April of 1999 (*See* LES Exhibit 18). As the PEIS was the first step of a tiered environmental review undertaken by DOE of the environmental impacts of the management, deconversion, and disposal of depleted uranium hexafluoride, I relied on the PEIS, as well as the site-specific EISs for Paducah, KY an Portsmouth, OH, in reaching the conclusion that the environmental impacts of constructing, operating, and decommissioning a deconversion facility had been appropriately evaluated.

Q18. What conclusions did you reach relative to the analysis undertaken by DOE in its two site-specific EISs and in its PEIS?

A18. (RMK) First, if LES should elect to send its depleted uranium hexafluoride to one of the two DOE facilities (in Portsmouth, OH or Paducah, KY), the environmental evaluations published by DOE, including the Programmatic Environmental Impact Statement and the site-specific EISs for the Portsmouth and Paducah sites, contain a comprehensive evaluation of the environmental impacts associated with the construction, operation, and decommissioning of these two facilities. These EISs comprehensively evaluated a wide range of environmental impacts, including human health and safety during construction and facility operation , as well as during transportation and in accident conditions. The EISs evaluated air quality and noise, water and soil, socioeconomics, ecology, waste management, resource requirements, land use, cultural resources and environmental justice. Importantly, the site-specific EISs for these two sites analyzed the environmental impacts associated with expanding conversion facility operations at each site beyond that needed to process DOE's DUF_6 to process additional DUF_6 that might be transferred to DOE at some time in the future by a commercial enrichment facility. In this regard, the site-specific EISs specifically analyzed the environmental impacts of two options: (i) extending the operational period for the deconversion facilities; or (ii) increasing plant throughput. In each case, the two site-specific EISs contain a thorough evaluation of the potential environmental impacts associated with each of these options (See LES Exhibit 16, Sections 2.2.7, 2.4.2.17, and 5.2.8; and LES Exhibit 17, Sections 2.2.5, 2.4.2.17, and 5.2.6). Thus, with regard to the option of transferring NEF's DUF_6 to a DOE deconversion facility, I concluded that the environmental impacts of this option have been thoroughly evaluated in the site-specific EISs for the construction and operation of deconversion facilities at Paducah, KY and Portsmouth, OH.

Q19. Do these EISs bound the environmental impacts of the private sector deconversion option, if LES should elect to pursue this option?

A19. (RMK) If LES should elect to pursue its "preferred" strategy of transporting the depleted uranium hexafluoride from the NEF plant to a private sector deconversion facility, the environmental evaluations published by DOE, comprising the site-specific EISs for the Paducah and Portsmouth sites and the Programmatic Environmental Impact Statement, appropriately address and bound the environmental impacts that might be associated with the construction, operation, and decommissioning of a private sector deconversion facility. Understanding that if LES elects to pursue a private sector deconversion facility, further environmental evaluation would be undertaken of the site-specific impacts of such a facility as part of the licensing process, the DOE Programmatic EIS and site-specific EISs (as well as the NRC FEIS for the CEC facility) adequately address the potential generic environmental impacts of such a facility in a way that "bounds" or "envelopes" those environmental impacts.

Q20. What is the basis for your conclusion that the DOE PEIS is sufficiently representative of, and hence bounding for, the environmental impacts that might be associated with a private sector deconversion facility?

A20. (RMK) As I indicated earlier, the NEF facility is conservatively estimated to generate 15,727 cylinders of DUF_6, during its 30-year licensed life, or approximately 196,588 metric tons of DUF_6. Assuming that the private sector deconversion facility is of a size that would accommodate the DUF_6 generated during the 30-year licensed life of the NEF, the environmental evaluations undertaken by DOE, which analyzed a facility to deconvert 61,422 cylinders of DUF_6 or approximately 739,000 metric tons of DUF_6 (*See* LES Exhibit 18, Section S.1.1, p. S-2) -- or nearly four times the capacity that would be required by LES in a private sector facility --

clearly bound the generic environmental impacts of a deconversion facility that might be built for the NEF DUF_6.

Q21. Would you describe the generic environmental impacts that, based upon the much larger deconversion facility analyzed by DOE in its PEIS, you believe are bounding for a private sector deconversion facility?

A21. (RMK) Yes. First, by way of context, it is important to understand that in analyzing the environmental impacts associated with a deconversion facility, DOE's PEIS assessed the impacts using representative or generic environmental settings, settings which, in turn, were based upon the three sites at which DOE's DUF_6 is currently stored. The range of environmental conditions present at these three existing DUF_6 storage sites -- Paducah, KY, Portsmouth OH, and Oak Ridge, TN -- was determined by DOE to be representative of potential sites for a deconversion facility. On this basis, DOE's analysis assumed as representative a population within a radius of 50 miles ranging from 500,000 to 880,000 (*See* LES Exhibit 18, Vol. 1, p. 5-2; Vol 2, Appendix F, pp. F-4, F-17). In my judgment, this is a reasonable range of environmental conditions for DOE to employ, and could reasonably be expected to encompass any site that might be selected for a private sector deconversion facility for NEF's DUF_6. For example, if a deconversion facility is located in the vicinity of the NEF, the range of population assumed in DOE's analysis is clearly bounding, as the population in the vicinity surrounding the NEF is less than 100,000.

Q22. Based upon the representative environmental settings analyzed by DOE, what conclusions did DOE's PEIS reach relative to the environmental impacts of a deconversion facility and why do you believe these conclusions are "bounding" or "conservative" relative to the environmental impacts that might result from LES's private sector deconversion facility?

A22. (RMK) DOE evaluated a comprehensive range of environnmental impacts that, in my opinion, would encompass the type of impacts that might be associated with a private sector

deconversion facility. These include the human health and safety impacts of a deconversion facility during both normal operation and accident conditions for both radiological and chemical exposures. DOE also evaluated the human health and safety impacts during transportation, both by truck and rail, including normal operation and assumed accident conditions. DOE also evaluated environmental impacts associated with air quality, water and soil, socioeconomics, ecology, waste management, resource requirements, land use, cultural resources, and environmental justice (*See* LES Exhibit 18, Vol. 1, Chapter 5). In short, I concluded that DOE's PEIS comprehensively evaluated all of the relevant environmental impacts that might be associated with the construction, operation, and decommissioning of a deconversion facility. I also concluded that, considering that the size of the deconversion facility evaluated by DOE in the PEIS was approximately four times the capacity that would be required for a facility for NEF's DUF_6 (740,000 MT DUF_6 versus 196,588 MT DUF_6), the environmental evaluation in the PEIS could be considered as bounding of any environmental impacts that could reasonably be expected if LES elects to pursue the private sector option

Q23. You indicated earlier that LES has not selected a specific deconversion process for conversion of DUF_6 to U_3O_8. Recognizing that such a decision has not yet been made, how were you able to conclude that the environmental evaluations upon which you relied were adequate to bound the environmental impacts of the alternative deconversion processes, any one of which might be employed?

A23. (RMK) DOE's Programmatic Environmental Impact Statement states that it considered two basic deconversion processes that might be employed for deconverting DUF_6 to U_3O_8: a process that would upgrade the concentrated HF to anhydrous HF and a process that would neutralize the hydrofluoric acid (*i.e.*, aqueous HF) by the addition of lime to form a solid fluoride salt (calcium fluoride) (See *LES* Exhibit 18, Vol. 2, pp. F-11-12). In this regard, the PEIS

explicitly states that "The environmental impacts of both options (production of anhydrous HF for commercial use and neutralization of HF to CaF_2) were considered in this PEIS" (See LES Exhibit 18,Vol. 1, p. 2-9). These two processes bound the three options described above, since the Framatome and Cogema processes both result in aqueous HF which can then be neutralized to CaF2. Likewise, the CEC FEIS considered the different deconversion processes and based its evaluation on a representative one.

Q24. Did you reach any conclusions with regard to the adequacy of the existing environmental evaluations related to the transportation activities associated with a deconversion facility?

A24. (RMK) The impacts associated with transportation are addressed extensively in DOE's PEIS, specifically in Appendix J (*See* LES Exhibit 18, Vol. 2, Appendix J). The analysis contained therein explicitly states that it addresses the environmental impacts associated with the transportation of depleted UF_6 cylinders, as well as the transportation of U_3O_8. The analysis also addresses the environmental impacts associated with the transportation of chemicals required for or produced during processing, such as hydrogen fluoride and ammonia, as well as any low-level radioactive waste, low-level mixed waste, and hazardous chemical waste generated during operations. The analysis also addresses the impact of transporting large quantities of calcium fluoride. Finally, the analysis indicates that transportation impacts were evaluated for distances ranging from 155 to 3,100 miles [250 to 5,000 km], a range that would certainly bound transportation distances that might be involved in a private sector facility (*See* LES Exhibit 18, Vol. 2, Appendix J, p. J-10).

Q25. In reviewing this analysis, did you conclude that it encompassed the types of material and the distances that such material might be transported if LES were to pursue the private sector deconversion option?

A25. (RMK) Yes, these are the types of materials that would be transported if we were to pursue the private sector deconversion option, although the quantities of such materials that we would be transporting if we were to pursue this option would be proportionally less than the quantities associated with the size of the deconversion facility and the volume of DUF_6 to be processed at that facility analyzed by DOE in its PEIS.

Q26. Did the PEIS appropriately evaluate the transportation modes that might be used if you were to pursue a private sector deconversion facility?

A26. (RMK) Yes, the PEIS explicitly evaluated both truck and rail transport modes (*See* LES Exhibit 18, Vol. 2, Appendix J, pp. J-8-9), the modes that we might consider if we were to pursue the private sector option.

Q27. Would you therefore consider the analysis of transportation impacts in the PEIS to bound any transportation impacts that might be associated with a private sector deconversion facility?

A27. (RMK) Yes, I believe the DOE analysis of transportation impacts in the PEIS, which encompasses both normal operations and accident conditions and which addresses the radiological and chemical impacts associated with each, bounds the transportation impacts that might be experienced with a private sector deconversion facility.

Q28. Did you reach any conclusion as to the adequacy of the existing environmental analyses for the environmental impacts associated with the decontamination and decommissioning of a deconversion facility?

A28. (RMK) Yes. The two site-specific EISs each analyze the environmental impacts associated with the decontamination and decommissioning of a deconversion facility (*See* LES Exhibit 16, section 2.4.2.15; LES Exhibit 17, section 2.4.1.15). The analyses considered the human health and safety impacts, both for the on-site workforce and the off-site public. The analyses also considered impacts associated with air quality, waste management, and

socioeconomics. In the case of radiation doses, the analyses indicated that the decontamination and decommissioning activities could be undertaken in a manner that would comply with all applicable regulatory standards. The analyses also estimated total waste volume that would be generated in the decontamination and decommissioning of the facility, noting, for example, that "of the total materials generated during the D&D of the conversion facility, both LLMW and hazardous wastes would make up 2% to 3% of the total, and LLW would constitute about 6% to 7% . The majority of the D&D materials (approximately 88% of the total) would be 'clean'" (*See* LES Exhibit 16, section 5.9.5, p. 5-142; LES Exhibit 17, section 5.9.5, p. 5-124-125). Based upon the comprehensiveness of DOE's analysis and, again, because the size of the deconversion facility evaluated by DOE would be a larger facility than compared to that required for NEF's DUF_6, I concluded that the environmental evaluation undertaken by DOE would clearly be bounding for a private sector deconversion facility, should LES decide to pursue this option.

Q29. Based upon your conclusion that the existing environmental impact statements appropriately bound the environmental impacts of a deconversion facility for NEF's DUF_6 -- whether at a private sector facility or at one of the DOE deconversion facilities -- was it appropriate, in your judgment, for the NRC, in its Draft Environmental Impact Statement ("DEIS"), to rely on these EISs in discussing the environmental impacts of a deconversion facility?

A29. (RMK) Yes, the EISs cited in the NRC's DEIS clearly bound the environmental impacts of a deconversion facility, whether a private sector or DOE facility, for the DUF_6 that will be generated by the NEF.

Q30. Does this conclude your testimony?

A30. (RMK) Yes.

RESUME

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EDUCATION

MS Nuclear Engineering - University of Illinois - 1973
BS Mechanical Engineering~ New Jersey Institute of Technology— 1972

EXPERIENCE

1998 to Present — Exelon (formerly Com Ed)

Vice President, Licensing Projects for Exelon Nuclear, with the overall responsibility for leading Exelon Nuclear's licensing activities on future generation ventures, predominantly leading the licensing effort for a U.S. gas centrifuge enrichment plant. In addition, I have been assisting with the Yucca Mountain project licensing effort and served as the lead on strategic licensing issues with the responsibility of working with the Nuclear Regulatory Commission and the Nuclear Energy Institute on the development of a new approach to licensing new reactors.

Vice President-Regulatory Services responsible for interface with the NRC and State regulatory agencies, and regulatory programs. This responsibility covers all 12 ComEd nuclear units and the Nuclear Generation Group headquarters. With respect to regulatory programs, responsibilities include programs such as the change evaluation process (i.e., 10 CFR *50.59,* "Changes, tests and experiments), the operability determination process, and the Updated Final Safety Analysis revision process). In this capacity, I was responsible for improving the relationship with the regulatory agencies such that, taken together with improved plant performance, the special scrutiny applied to the CornEd operating plants will be replaced with the normal oversight process. The Regulatory Services organization consists of a group located at the Nuclear Generation Group headquarters and a Regulatory Assurance group at each plant that has a matrix reporting relationship to the Vice President-Regulatory Services.

1994 to 1998 — Carolina Power & Light Company

As Chief Engineer from November 1996 to April 1998, I was head ofthe Chief Section oftlie Nuclear Engineering Department. In this capacity, I was responsible for maintaining the plant design bases and developing, maintaining and enforcing the engineering processes procedures. In addition to the corporate Chief Section, the Design Control groups at each of the nuclear plant sites reported to me starting in February 1997.

As Manager - Regulatory Affairs at the H. B. Robinson Steam Electric Plant, Unit No. 2 (Westinghouse PWR) from February 1994 to November 1996, the managers of Licensing/Regulatory Programs, Emergency Preparedness, and Corrective Action/Operating Experience Program organizations reported to me. As such, I was responsible for all interface and licensing activities involving the NRC headquarters and regional office, environmental regulatory agencies, and the Institute of Nuclear Power Operations. My responsibilities also included implementation of the Emergency Preparedness program, and administration of the Corrective Action and Operating Experience programs. After assuming my position in Carolina Power &

Light Company, I was instrumental in revising and upgrading the I OCFR5O.59 safety evaluation program, and was responsible for its implementation at the plant site. My group was also responsible for leading the team that prepared the NRC submittal containing the conversion to the improved Technical Specifications.

1988 to 1994 — Philadelphia Electric Company

As Manager - Limerick Licensing Branch at the Nuclear Group Headquarters, responsible for all licensing activities for the two unit Limerick Generating Station (General Electric BWR) conducted with the NRC headquarters and all enforcement issues involving NRC Region I, including completion of the final tasks leading to issuance of the Unit 2 Operating License. Special projects included assisting in the development of the Design Baseline Document program, obtaining NRC approval for an Emergency Operations Facility common to two sites, preparation of the Technical Specification changes to extend the plant refueling cycle to 24 months and to allow plant operation at uprated power, and obtaining NRC approval of a change to the Limerick Operating Licenses to accept and use the spent fuel from the Shoreham plant. I was also responsible for the development and implementation of the IOCFR5O.59 safety evaluation process used throughout the nuclear organization, development of the initial Updated Final Safety Analysis Report for Limerick Generating Station, and served as the Company's Primary Representative to the BWR Owners' Group.

1986 to 1988 — Virginia Power Company

As the Senior Staff Engineer in the Safety Evaluation and Control section, my activities involved responding to both routine and special licensing issues pertaining to North Anna Power Station (Westinghouse PWR). My duties ranged from preparing Technical Specification interpretations and change requests, exemption requests, and coordinating responses to NRC inspection reports, to developing presentations for NRC enforcement conferences and coordinating licensing activities associated with long-term issues such as ATWS and equipment qualification. I was also the Company representative to the utility group formed to address the station blackout issue, and was particularly involved in developing an acceptable method by which utilities can address equipment operability during station blackout conditions.

1981 to 1986 — Consumers Power Company

During my employment with Consumers Power Company, I worked at the General Office in the Nuclear Licensing Department and the Company's Palisades Plant (Combustion Engineering PWR). While in the Nuclear Licensing Department, I held the position of Plant Licensing Engineer for the Big Rock Point Plant (General Electric BWR), Section I-lead - Special Projects Section, and Section Head - Licensing Projects and Generic Issues Section. My responsibilities while in these positions included managing the initial and continuing Palisades Plant FSAR update effort, developing and operating a computerized commitment tracking system, managing the licensing activities supporting the expansion of the Palisades Plant spent fuel storage capacity, and coordinating activities associated with various generic issues such as fire protection and seismic qualification of equipment. As the administrative point of contact for INPO, I coordinated the Company's efforts in responding to plant and corporate INPO evaluations. At the Palisades Plant, I was head of the Plant Licensing Department. My responsibilities primarily entailed managing the on-site licensing activities, including preparation of Licensee Event Reports and responses to

inspection reports, interfacing with NRC resident and regional inspectors, and serving as chairman of the on-site safety review committee. I also administered the on-site corrective action system and managed the on-site program for the review and implementation of industry operating experience.

1974 to 1981 General Atomic Company

My positions while at the General Atomic Company were principally concerned with fuel performance development efforts for the High Temperature Gas-Cooled Reactor (HTGR). Specific responsibilities included two assignments to the French Atomic Energy Commission laboratories at Saclay and Grenoble (France) for the purpose of coordinating a cooperative test program. I was also assigned as a consultant to the Bechtel Corporation, Los Angeles Power Division, and worked in the Nuclear Group of the Alvin M. Vogtle Nuclear Project for Georgia Power.

RELATED EXPERIENCE

University of Illinois

As a graduate research assistant, I assisted in both the experimental and analytical phases of a NASA-funded program in the study and modeling of far-field noise generated by near-field turbulence in jets.

PUBLICATIONS

General Atomic Company

"CPL-2 Analysis: Fission Product Release, Plateout and Liftoff."

University of Illinois

"Prediction of Far-Field Sound Power Level for Jet Flows from Flow Field Pressure Model," paper 75-440 in the AIAA Journal, co-authored by Jones, Weber, Hammersley, Planchon, Krich, McDowell, and Northranandan.

MEMBERSHIPS

American Nuclear Society
Pi Tau Sigma -Mechanical Engineers 1-Honorary Fraternity
American Association for the Advancement of Science

REFERENCES

Furnished upon request