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July 19, 2005

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	Docket No. 70-3103
Louisiana Energy Services, L.P.	ASLBP No. 04-826-01-ML

RESPONSES ON BEHALF OF
INTERVENORS NUCLEAR INFORMATION AND RESOURCE SERVICE
AND PUBLIC CITIZEN
TO APPLICANT'S INTERROGATORIES DATED JULY 8, 2005

Intervenors, Nuclear Information and Resource Service and Public Citizen ("NIRS/PC"), hereby respond to the Applicant's Interrogatories to NIRS/PC, served on July 8, 2005:

Contention EC-3/TC-1 – Depleted Uranium Hexafluoride Storage and Disposal

1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.

2. Provide the educational and scientific expertise of each witness.

Response: 1, 2:

The testifying expert will be Dr. Arjun Makhijani, whose resume is attached to the Petition.

3. Provide the subject matter on which each of the witnesses is expected to testify.

Response: 3:

Dr. Makhijani will testify in his direct testimony on matters relating to whether Louisiana Energy Services, L.P. ("LES") has a plausible strategy for the dispositioning of depleted uranium ("DU") from the proposed National Enrichment Facility ("NEF"). Such testimony will involve,

Template = SECY-035

SECY-02

inter alia, the need for analysis of the specific site selected for disposal, the likely performance of the Waste Control Specialists ("WCS") site in Andrews County, Texas, as a disposal site for DU; and the eligibility and likely performance of the Clive, Utah, site owned by Envirocare of Utah ("Envirocare") for disposal of DU.

4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.

Response 4:

Detail concerning the substance of Dr. Makhijani's testimony is contained in the NIRS/PC Motion dated July 5, 2005, seeking leave to file late-filed and supplemental contentions, the report annexed thereto (the *Update to Costs and Risks of Management and Disposal of Depleted Uranium from the National Enrichment Facility Proposed to be Built in Lea County New Mexico by LES* by Arjun Makhijani, PhD. and Brice Smith, Ph.D.)(the "July 2005 Report"), and the report previously filed in this case (*Costs and Risks of Management and Disposal of Depleted Uranium from the National Enrichment Facility Proposed to be Built in Lea County New Mexico by LES* by Arjun Makhijani, PhD. and Brice Smith, Ph.D.)(the "November 2004 Report"). Most of the documents to which Dr. Makhijani may refer are cited herein and in materials referred to in these responses. Additional items and demonstrative exhibits may be identified at the time provided for submission of prefiled direct testimony.

The substance of Dr. Makhijani's testimony concerning disposal of DU from the NEF at the Waste Control Specialists ("WCS") site in Andrews County, Texas, or the Envirocare of Utah ("Envirocare") site at Clive, Utah, is set forth in NIRS/PC's Responses to Interrogatories by the Commission Staff dated July 8, 2005; see Responses 6, 9, 10, 11, 12, 13, 17, 18.

5. This contention alleges, *inter alia,* that "Louisiana Energy Services, L.P. ('LES') does not have a sound, reliable, or plausible strategy for private sector disposal of the large amounts of radioactive and hazardous Depleted Uranium Hexafluoride (DUF_6) that the operation of the plant would produce . . .".

    a. What is the purpose of requiring an applicant to demonstrate that it has a "plausible strategy"?

Response a:

The requirement of a "plausible strategy" is a legal standard developed by the Commission that serves several purposes. As derived from applicable regulations contained in 10 CFR, the "plausible strategy" requirement calls upon the applicant to address the technical, financial, and insurance provisions and resources for dealing with the disposition of depleted uranium hexafluoride tails. In addition, environmental analyses under the National Environmental Policy Act ("NEPA") must address the disposition of depleted tails pursuant to the defined "plausible strategy" and appropriate alternatives. The Board in the Claiborne Enrichment Center proceeding explained how the "plausible strategy" requirement derives from the regulations calling for a decommissioning funding plan that includes a cost estimate for decommissioning, citing 10 CFR 70.25(a) and (e). *Louisiana Energy Services* (Claiborne Enrichment Center), LBP-97-3, 45 NRC 99, 101-02 (March 7, 1997). Further, "for the regulation to have meaning the cost estimate should contain reasonable estimates for an adequately described decommissioning strategy." 34 NRC 332, 337-38. Thus, a purpose of the requirement is to require that the decommissioning strategy be sufficiently described, so that cost estimates may be based upon it with assurance that the estimates are reasonable. In other words, the description, and the confidence with which it can be relied upon, must serve to put bounds upon the costs of disposal. The purpose of such requirement is to ensure that funds will be available to accomplish waste disposal according to applicable health and safety standards. Such

a requirement is particularly important in the case of an applicant, like LES, that must finance the dispositioning of DU from operations and does not have access to other funding in the event that financial assurance proves inadequate. In such inquiry, it is appropriate and necessary to investigate whether deconversion and disposal can actually be accomplished as described and will meet applicable release and dose limitations. Such investigation includes the models and parameter values used in projecting future performance of a disposal site and addresses the release and dose limits that apply to disposal of the type of waste in issue. There must be, in other words, a reasonable and credible plan to dispose of DUF_6 tails. The cost estimates for the components of the plan must also be reasonable. The purpose of the tails disposal strategy is to enable the computation of a reasonable ad credible cost estimate for the various essential elements of the decommissioning plan.

b. What must an applicant show in order to demonstrate that it has a "plausible strategy"? Is the applicant required to select specific sites at which DUF_6 disposition activities would be carried out? Is the applicant required to select a specific site for a deconversion facility? For a disposal facility? Must these facilities have been granted a license by the responsible regulatory authority in order to satisfy the demonstration required for a "plausible strategy"? Must these facilities be in operation in order to satisfy the demonstration required for a "plausible strategy"?

Response b:

The showing needed to establish that a proposed strategy is "plausible" may depend upon the particular strategy presented. It has been stated that a plausible strategy does not need to include completion of all necessary contractual arrangements. *Louisiana Energy Services* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 226 (August 18, 2005). However, a plausible strategy is a reasonable and credible plan. Where a strategy was presented that did not incorporate costs for neutralizing byproduct hydrofluoric acid, it was deemed not to be plausible. *Louisiana Energy Services* (Claiborne Enrichment Center), LBP-97-3, 45 NRC 99, 116-17

(March 7, 1997). In some situations it is not possible to establish the cost of an element of a dispositioning plan unless a business commitment of some level of assurance is provided. If compliance with regulatory limits depends upon the specific characteristics of a deconversion site, it may well be necessary to identify the deconversion site before the deconversion strategy may be deemed plausible. Further, it is not possible properly to determine whether a given DU disposal strategy will accomplish disposal within regulatory performance limits without identifying a specific disposal site and assessing the performance of that specific site. NIRS/PC do not contend that a facility must be fully licensed in all respects and in operation to form part of a "plausible strategy"; however, if a facility is unable to be licensed or to operate as proposed, it would not be a credible element of a DU dispositioning strategy.

c. Must an applicant have entered into any contractual arrangements for the disposition of DUF_6 in order to satisfy the demonstration required for a "plausible strategy"?

Response c:

The Commission has stated: "While a 'plausible strategy' for private conversion of the tails does not mean a definite or certain strategy, to include completion of all necessary contractual arrangements, it must represent more than mere speculation." *Louisiana Enrichment Services, L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 226 (Aug. 18, 2004). Thus, the need for contractual arrangements depends upon whether such arrangements are necessary to make the plan reasonable and credible. If certain services or goods are difficult to obtain or where the potential contracting parties may have one of the following:

- Potential statutory or regulatory restrictions (i.e., Envirocare)
- A history of failure to fulfill legally binding contracts and a failure to accept responsibility for the resulting consequences (i.e., the Department of Energy)

- A lack of regulatory or statutory authority and a demonstration of a lack of technical and scientific competence in the properties of uranium bearing wastes (i.e., Waste Control Specialists),

it may be important to show such contractual arrangements to take the plan out of the category of speculation.

d. Must an applicant present an "actual plan" to dispose of DUF_6? What is meant by the term "actual plan", as that term is used in NIRS/PC's July 5, 2005 Motion (see p. 2)? What is the difference between an "actual plan" and a "decommissioning plan", as this latter term is used in 10 C.F.R. Part 70?

Response d:

The statement on page 2 of the July 5, 2005 Motion refers to the strategy adopted by LES for dispositioning of DU, including deconversion, transportation, and disposal. The Board in the Claiborne proceeding discussed at length the meaning of "plausible strategy."

It stated, inter alia:

> "The dictionary defines "plausible" as "reasonable" or "credible," Webster's Third New International Dictionary 1736 (1971), and "strategy" as a "plan." Id. at 2256. Thus, in assessing the plausible tails disposal strategy adopted by the Applicant as part of its decommissioning funding plan, we first must determine whether the funding plan contains a reasonable or credible plan to dispose of the DUF_6 tails generated at the CEC and then determine whether the Applicant's cost estimates for the components of the plan are reasonable." (45 NRC 99, 105).

The Board explained that the tails disposal strategy is part of the decommissioning funding plan. The decommissioning plan required by 10 CFR Part 70, on the other hand, is referred to in 10 CFR 70.38(g)(1) and may be required by the license or when the procedures and activities necessary to carry out decommissioning of the site or separate building or outdoor area have not been previously approved by the Commission and such procedures could increase potential health and safety impacts to workers or to the public. See NEF Safety Analysis Report ("SAR")

at 10.0-1 (Rev. 2, July 2004). The components of a decommissioning plan are specified in 10 CFR 70.38(g)(4) and include an updated detailed cost estimate for decommissioning.

e. What is meant by the term "disposal strategy", as that term is used in NIRS/PC's July 5, 2005 Motion (see p. 9) Is an applicant required to demonstrate that it has a "disposal strategy"? If so, what is the regulatory basis for this requirement? Does 10 CFR 70.25 require a "disposal strategy"? If so, identify where, specifically, this is required in 10 C.F.R. 70.25.

Response e:

The "disposal strategy" referred to in the July 5, 2005 motion (page 9) is an element of a plausible strategy for dispositioning DU. The discussion referred to concerns the regulatory requirement that the Applicant set forth a decommissioning funding plan based upon a decommissioning cost estimate. (10 CFR 70.25(e); see also Responses a, b, c, d). The Board in the Claiborne proceeding stated that the regulations call for an adequately described decommissioning strategy:

> "In admitting contention B, the Board noted that the Commission's hearing notice for the licensing proceeding directed that the Applicant must have a "plausible strategy" for the disposition of DUF_6 tails. 56 Fed. Reg. 23,310, 23,313 (1991). Additionally, the Board stated that the Commission's regulations, 10 C.F.R. § 70.25(a), (e), require that the Applicant submit a decommissioning funding plan containing a cost estimate for decommissioning and the means for adjusting cost estimates and funding levels periodically over the life of the facility. See also 10 C.F.R. § 40.36(a), (c)(1), (d), (e)(3). In light of these factors, the Board ruled that, although there was no regulatory requirement that the Applicant have a "concrete plan" for the disposal of depleted uranium tails, LES must have a plausible strategy for tails disposition and, in order for the regulations to have any meaning, the Applicant's "cost estimate should contain reasonable estimates for an adequately described decommissioning strategy." 34 NRC at 338. Thus, the Board ruled that CANT's contention B supported by bases B.1, B.4, and B.5 had satisfied the Commission's contention pleading requirements by alleging that "the decommissioning funding plan does not contain reasonable estimates for decommissioning nor does it adequately describe the underlying decommissioning strategy." (45 NRC 99, 101-02).

The plausible strategy requirement, therefore, derives from Commission regulations.

f. What is the purpose of 10 C.F.R. 70.25?

Response f:

The cited regulation has several purposes, which may best be understood from a reading of the regulation and its history and interpretations. Among other things, 10 CFR 70.25 has the purpose of requiring financial assurance and recordkeeping for decommissioning.

Contention EC-5/TC-2 – AGNM TC-I – Decommissioning costs

1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.
2. Provide the educational and scientific expertise of each witness.

Response 1-2:

The testifying expert will be Dr. Arjun Makhijani, whose resume is attached to the Petition.

3. Provide the subject matter on which each of the witnesses is expected to testify.

Response 3:

The subject matter on which Dr. Makhijani is expected to testify is contained in the November 2004 and July 2005 Reports and in the Responses by NIRS/PC to Interrogatories by Commission Staff, dated July 8, 2005, Responses 4 through 23.

4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.

Response 4:

At present it is known that Dr. Makhijani will address the following matters in his direct testimony. Additional detail concerning the substance of Dr. Makhijani's testimony is contained in NIRS/PC's motions to amend their contentions concerning dispositioning costs, dated May 16 and May 20, 2005 and the NIRS/PC Motion dated July 5, 2005, seeking leave to file late-filed

and supplemental contentions, the report annexed thereto (the "July 2005 Report"), the report previously filed in this case (the "November 2004 Report"), and Responses by NIRS/PC to Interrogatories by Commission Staff, dated July 8, 2005, Responses 4 through 23. Most of the documents to which Dr. Makhijani may refer are cited herein and in materials referred to in these responses. Additional items and demonstrative exhibits may be identified at the time provided in the schedule for submission of prefiled direct testimony. The following matters will be covered in Dr. Makhijani's direct testimony:

a. The materials submitted by LES to Commission Staff in January through April 2005 fail to support the cost estimates submitted by LES on January 7, 2005.

b. Specifically, the AREVA Memorandum of Understanding ("MOU") submitted by LES asserts that AREVA has access to processes, technology, and experience to construct a deconversion plant to produce material suitable for disposal as Class A low-level radioactive waste, but it does not support such conclusion, *e.g.*, by showing that the waste would be "acceptable for disposal in a land disposal facility" (10 CFR 61.2, "*Waste*") or that such material would appropriately be classified as "Class A" waste. The material in fact would be neither Part 61 "waste" nor Class A LLRW. Moreover, the AREVA MOU states only that the parties will conduct discussions toward a contract concerning a deconversion plant, but it does not commit any party to make such a contract, nor to take important steps toward such a contract. There are no estimates of conversion costs in the AREVA MOU.

c. The e-mail from TLI, dated Dec. 2, 2004, makes no commitment to provide transportation services and does not provide any information to support the figures stated. The message merely states that for "movements" of DUF_6 the cost would be stated amounts per Kg and for DU_3O_8 the cost would be stated amounts per Kg, but the basis and derivation of such numbers is not stated, nor is there any reason to rely upon them.

d. The February 3, 2005 letter from Envirocare states only that Envirocare is licensed to dispose of depleted U_3O_8 "subject to the material meeting Envirocare's licenses, permits, and operational requirements," which the letter does not describe. Thus, it makes no commitment to accept waste from the NEF. Further, concerning disposal costs, the Envirocare letter says only that the LES application contains a "conservative estimate of what it would currently cost at standard depleted U_3O_8 density to dispose of such material." Envirocare makes no commitment to a disposal price in the thirty year future when the NEF would generate DU. Indeed, Envirocare states that "[o]f course, disposal charges are subject to change in the future based on a variety of factors." In addition, in February 2005, Envirocare officially withdrew its license application seeking approval for the site to accept Class B and C low-level waste.[1] Envirocare's withdrawal of its application came shortly before citizens' efforts were successful in convincing the Utah House and Senate to pass legislation banning the importation of these wastes into the state. In addition, in June 2005, license amendment 22 to the Envirocare license was

[1] Envirocare press release, Envirocare Purchased by Investor Group; New Owners Call for Ban of B and C Waste in the State of Utah, February 1, 2005.

adopted adding restrictions on the acceptance of certain depleted uranium bearing wastes. It is explained further elsewhere (July 2005 Report at 7-8) that Envirocare is not in a position to accept DU from the NEF for disposal.

e. The March 1, 2005 letter from the U.S. Department of Energy ("DOE") contains cost estimates for conversion, transportation, storage, and disposal per Kg DUF_6 but does not explain the derivation of the costs except to say that DOE assumed conversion, storage and disposal consistent with operation of the Portsmouth and Paducah deconversion plants. Those plants would convert, but not dispose of, depleted uranium. Currently, neither facility has been built. DOE cost estimates do not contain a contingency factor and have other problems such as a lack of provision for storage costs and emerging risks of uranium. DOE made no commitment to the long-term validity of its estimate, stating that it is "subject to recalculation and change as assumptions and circumstances change and as the Department receives actual cost and performance data" and added that any agreement to accept DUF_6 is subject to NEPA compliance and negotiation of terms. Therefore, DOE gave no assurance that conversion or disposal would be available at the costs stated. This is particularly important, given the notorious history of delays, technical problems, and cost overruns for previous DOE programs generally, including their environmental and waste management projects. Examples include the National Ignition Facility, the vitrification plants at Hanford Site and Savannah River Site, the Fernald vitrification plant, the Yucca Mountain repository project, and the Idaho National Laboratory Pit 9 project. Moreover,

DOE's estimate of the cost of DOE deconversion and disposal is not relevant to LES's preferred alternative, which is private deconversion and disposal. (ER at 4.13-8). Especially relevant in this context is the DOE history of its failure to fulfill its contractual obligation to nuclear utilities to begin taking spent fuel on January 31, 1998.

f. On March 2, 2005, LES told Commission Staff that "the basis for the disposal, conversion, and transportation costs would be provided." (Commission Staff file memo, March 15, 2005). On March 3, 2005, LES advised the Staff that the supporting information was provided in letters dated November 1, 2004 and January 31, 2005 from LES's counsel. The cited material includes:

   i. A spread sheet that apparently shows projected quantities and costs of a deconversion operation, stated in euros, under various different assumptions, none of which is explained or justified. In subsequent submissions LES placed no reliance upon this spread sheet and did not explain what it relates to. Its origin and meaning are still unexplained.

   ii. The WCS Memorandum of Agreement ("MOA"), which states only that WCS owns and operates a facility in Andrews County, Texas, is currently applying for a license to dispose of radioactive materials including depleted U_3O_8, and that the parties agree to conduct discussions concerning a contract for disposal of depleted U_3O_8. WCS represents that it expects to obtain disposal licenses authorizing disposal of depleted U_3O_8 generated within the Texas Compact and that the price of disposal will be set by the Texas Compact.

Concerning such price, WCS stated that it "anticipates that those prices are expected to range between approximately [stated amounts] per cubic foot (in 2004 dollars)." (at 2). Therefore, WCS—having no license—made no commitment to accept any specific quantity of waste for disposal. Moreover, since the price for disposal would be set by the Texas Compact, not WCS, WCS did not commit to a price for disposal. Further, the prices stated are far lower than published prices for Atlantic Compact disposal, which range from $276 to $414 per cubic foot, depending on the class of waste. (http://www.energy.sc.gov/RadWaste.rwdp_index.htm)

iii. The e-mail from Fisk of TLI to Krich of NEF, which makes no commitment to transportation of DU in any form and merely contains unexplained and unsupported ranges of estimates.

g. LES on March 11 submitted certain revisions to its application (Rev. 4), wherein LES stated that the LLNL, CED, and UDS cost estimates were now used only to "inform" the LES cost estimate. LES offered a new dollar estimate per KgU in 2004 dollars, without contingency, "based on information from corresponding vendors." The intended vendors were not identified. This submission contains no new information to support the cost estimates or the availability of deconversion or disposal services.

h. On March 29, 2005, LES by letter to Commission Staff advised that the information underlying LES's cost estimates for conversion, disposal, and transportation was proprietary and would be submitted separately. Some

further information was given as to the estimated cost of disposal of CaF_2. However, no information of any substance was provided concerning the cost of deconversion, transportation, or disposal.

i. On April 8, 2005, LES sent a letter to Commission Staff, which was produced to NIRS/PC by letter dated April 20, 2005, containing certain proprietary information:

   i. Attachment 1, concerning deconversion costs, is "based on discussions with developers of deconversion technology." It describes a plant to produce DU_3O_8 and aqueous hydrofluoric acid in general terms. Cost items are described generally and are said to be "conservative" in the view of AREVA. However, no bases are provided for the numbers given, and their derivation is not set forth. LES states only that the cost estimate includes the capital cost of all equipment necessary, utility infrastructure, and space for administration, shipping and receiving, and storage; licensing is expected to take up to three years, engineering work will reflect the specific size of the facility to support the NEF; and operations and maintenance costs mainly involve wages. Such conclusory statements tell nothing about the actual assumptions underlying the estimates. There is no breakdown of any of the elements of the estimate. We are not told how the facility cost estimate was developed. The same applies to other cost elements, e.g., for licensing and engineering, for annual operations and maintenance,

and for decontamination and decommissioning. The large cost numbers are unexplained.

ii. Attachment 2, concerning transportation costs, is the e-mail message previously produced, which has no explanation of the ranges of costs stated.

iii. Attachment 3, concerning disposal costs, contains only some figures representing the volume of U_3O_8 at various densities (attributed to different sources) and calculates the total disposal cost, assuming that LES is charged a stated amount per cubic foot. The only basis for the stated figure is the WCS MOA, another copy of which is attached; this document refers to an anticipated price range but gives no explanation of, or commitment to, those figures, particularly since the price will be set by the Texas Compact, not by WCS. Further, LES gives no justification for selecting the lowest cost number in the stated range to make its estimate.

j. On April 19, 2005, Commission Staff met with LES personnel to review LES's estimates of decommissioning funding. (Commission Staff file memo, April 29, 2005, listed in Hearing File index dated May 11, 2005). Commission Staff then stated that the April 8, 2005 submission concerning deconversion costs was an insufficient basis for accepting LES's deconversion cost estimate and, in addition, sought clarification of LES's disposal cost estimate. LES stated that the deconversion cost estimate was based upon a proprietary Urenco business study, which was in turn based upon a submission by Cogema in

response to a Urenco request for proposal. LES explained that it had modified the Cogema information to reflect increased operating, capital, and licensing costs and costs associated with "Americanizing" the design. LES said that it had also (a) accounted for the fact that aqueous hydrofluoric acid ("HF") would not be sold, (b) accounted for costs of neutralization of HF, and (c) eliminated storage costs. Further, concerning LES's disposal cost estimate, LES justified its reliance on the lowest point on the range quoted by Waste Control Specialists ("WCS"), stating that the WCS figure was "similar" to a figure quoted by Envirocare, Inc. for disposal of certain decommissioning waste. According to Commission Staff's memorandum, Staff accepted these explanations as sufficient.

k. This additional information is clearly inadequate to justify reliance on LES's cost estimates. Nothing of substance has been added to LES's inadequate submission of April 8, 2005. The record is clearly inadequate for the Commission to evaluate the adequacy of the treatment of such fundamental matters involving LES's estimate of deconversion costs as:

   i. Capital cost estimates
   ii. Licensing cost estimates
   iii. Engineering cost estimates
   iv. Estimates of operating and maintenance costs
   v. Decontamination and decommissioning costs
   vi. Adjustments involving the neutralization of HF and disposal of CaF_2 versus storage and resale of HF

vii. Adjustments involving the scale and lifetime of the deconversion facility

viii. Adjustments involved in "Americanizing" the project

ix. Currency exchange adjustments

x. Adjustments involving construction costs in a rural location

For example, LES "indicated that they believe that neutralization would have no effect on the overall deconversion costs because those costs would be balanced by the elimination of costs for equipment for storing HF prior to commercial sale."[2] However, this claim stands in contrast with the conclusions of the 1997 LLNL cost analysis. For the DU_3O_8 deconversion option, the LLNL analysis found that neutralization and disposal of calcium fluoride added between 27 percent to more than 100 percent to the total deconversion cost relative to the production and sale of anhydrous HF.[3] The LLNL cost figure for CaF_2 disposal was $2.00 per kgU, while LES has claimed it will be 100 times less at 2 cents per kgU, without offering a serious analysis. While this analysis did not consider the sale of aqueous HF, it highlights the serious questions that remain surrounding the claimed basis for the LES cost estimates. This same contradiction in conclusions is apparent with respect to the information in the Cogema business study supposedly relied upon by LES in making its current cost estimates. The Cogema analysis prepared for Urenco concluded that "[u]nder this scenario [no resale of

[2] Memo from Timothy C. Johnson to James W. Clifford, *April 19, 2005, In-Office Review Summary: Louisiana Energy Services Decommissioning Funding*, April 29, 2005

[3] Hatem Elayat, Julie Zoller, and Lisa Szytel, *Cost Analysis Report for the Long-Term Management of Depleted Uranium Hexafluoride*, Lawrence Livermore National Laboratory, May 1997 (UCRL-Ar-127650)

hydrofluoric acid] the HF requires neutralization this increases the effective provision by [a stated amount]." (*Business Study: Tails Deconversion and Cylinder Washing Plants at Urenco (Capenhurst) Limited*, August 26, 2004 at 9).

l. LES's statement that it has adopted, as its disposal cost estimate, the lowest point on WCS's range of estimates, because Envirocare has quoted a similar cost for disposal of decommissioning waste, adds nothing to the validity of LES's disposal cost estimate. There is no showing that the Envirocare estimate involves material that presents similar risks to the quantity of bulk DU that would be generated by the NEF. There is no showing that the waste for which Envirocare quoted a disposal cost is similar to DU from the NEF in any aspect relevant to its disposal, such as:

i. The concentration of radionuclides in the waste

ii. The radionuclides' half-lives

iii. The radionuclides' environmental mobility

iv. The health risks associated with the radionuclides, such as potential risks indicated by recent research on uranium.

v. The radionuclides' suitability for near-surface disposal in general, after consideration of risks of release, and the likely need for deep disposal in a geologic repository

vi. The need for using an engineered waste form for disposal such as grouting or ceramic containment of UO_2

The Commission should not accept a cost estimate for disposal of DU from the NEF without investigating and considering such factors. Deep disposal of depleted uranium in a repository, which is likely to be required to meet 10 CFR Part 61 Commission dose limits, would cost well in excess of the amounts quoted by LES and could not be done at the Envirocare or proposed WCS facilities. See November 2004 Report at 3-29, 40-42, 47-51, and NIRS/PC Petition for Leave to Intervene, at 28-31, 34-38, April 6, 2004.

m. There is no analysis presented underlying the cost quotation attributed to Envirocare. Since Envirocare has made no offer or commitment to accept and dispose of waste generated during the operating life of the NEF at the price quoted, but has only suggested the number as a guideline, since Envirocare is likely not now licensed to accept large amounts of DU waste, and since LES apparently intends to dispose of the waste at a different facility, in a different state, with a different design, and a different company as the operator, the quotation cannot be used as the basis for determining a plausible disposal strategy in a licensing action without an explanation of the capital and operating costs underlying the estimate, to provide some assurance that the estimate is likely to correspond to the proposed option.

n. There is no analysis presented underlying the cost quotation attributed to WCS. WCS has made no commitment to accept and dispose of waste at any price, and certainly has not offered or committed to accept and dispose of waste generated during the operating life of the NEF at the price quoted. Therefore, the disposal cost estimate in issue here—the disposal of DU by

WCS—requires a cost analysis based upon WCS's capital and operating costs, and other factors that would go into the determination of disposal charges by the Texas Compact Commission, which is the body that sets rates for waste disposal by WCS. No such analyses have been presented, and the Commission cannot accept LES's unfounded and unexplained use of the lowest estimate from WCS, particularly when the disposal of DU has not been considered in the WCS license application, and there is the likelihood that near-surface disposal will not be appropriate and that disposal in a deep geologic repository will ultimately be required.

o. In sum, the bases for the cost estimates are not adequately disclosed by the materials presented by LES. No documents have been produced in discovery that provide adequate details of how the estimates on which LES currently relies were developed. As the issue of how the cost of HF neutralization was accounted for as discussed above shows, there are important issues remaining unresolved as to how the LES cost estimates for deconversion were derived. There are no adequate explanations of the bases underlying the transportation cost estimate. There are no adequate explanations of the bases underlying the projected cost of disposal. The numbers are given in support of the deconversion estimate are largely unexplained. LES has supplied the Commission mainly with LES's conclusions, with little disclosure of the bases for such conclusions.

p. With the latest statements by LES, it remains a fact that LES has still not provided adequate factual bases or documentary support needed for its

estimates of dispositioning costs. LES's disposal strategy remains in the realm of speculation, supported by no valid estimates, much less contractual commitments.

q. With the information furnished by LES, it is not possible to discern whether the cost estimates account for several factors necessary to incorporate in a cost estimate. Among the factors that should be considered in the estimates of disposal cost is the fact that DU is generally unsuitable for near-surface disposal, because of its radiological and chemical properties. The WCS site, Envirocare site, or another near-surface disposal site will probably be unable to demonstrate compliance with Commission dose limits for LLRW disposal. See the discussion in subparagraph ff, below.

r. In addition, the LES cost estimates do not make clear how scaling considerations have been addressed. See the discussion in the November 2004 Report at 37 and Response to Commission Staff Interrogatories dated July 8, 2005, Response 22.

s. It is not shown in LES's deconversion materials whether LES has appropriately accounted for current and future currency exchange rates. LES has apparently used data derived from experience in Europe in the euro economy and has somehow converted such data to dollars, but it has not shown how this was done. Neither has LES shown how it proposes to account for future exchange rate fluctuations, which may affect future deconversion costs because of the plant's use of imported goods and technologies. See the November 2004 Report at 38-40.

t. From the LES showing, it is not possible to determine whether the projected costs of disposal include an allowance to account for recent research indicating that uranium may potentially have more varied health effects than currently accounted for in regulations, including the possibility that it may function in the body as a kind of radioactive lead, causing neurological impacts, particularly in young children. Financial contingency provisions to account for newly emerging risks should be incorporated, in particular, in disposal cost estimates. See the November 2004 Report at 8-19, 40-42; July 2005 Report at 24.

u. LES's estimates of costs of deconversion and disposal do not sufficiently account for the costs of delays in licensing new radioactive waste treatment and disposal facilities. See the November 2004 Report at 24.

v. Certain additional statements contained in the Safety Evaluation Report ("SER") dated June 15, 2005, concerning dispositioning costs are likewise unsupported. In this document also the factor applied in converting euros to dollars is not stated, nor are its bases explained. See the discussion in the November 2004 Report at 38-40.

w. It is said in the SER that the deconversion cost estimate was adjusted for "Americanization," referring to costs of obtaining regulatory approval and costs to convert European equipment standards to those used in the United States, but the amount of such adjustments and their rationale are not explained. It is not possible to evaluate the validity of claimed adjustments for "Americanization" of design and licensing costs without knowing how

such adjustments have been made by LES and approved by Commission Staff.

x. Staff are said, in the SER, to have reviewed an estimate for disposition of DOE tails and to consider that the DOE estimate provides additional assurance that the applicant's cost estimate is reasonable. However, this reasoning is not explained. The DOE estimate referred to has several deficiencies: It cannot be assumed that DU from the NEF will be disposed of at the Envirocare site, because specific prohibitions in the most recent license amendment are likely to bar the amounts of DU that would be sent for disposal, the Envirocare site is authorized by permit and by state law to receive only Class A LLRW, and the DU from the NEF would not properly be classified as Class A waste. See the July 2005 Report at 6-7. Moreover, in the Draft Environmental Impact Statement, NUREG-1790, September 2004 ("DEIS"), in statements that Commission Staff deleted from the FEIS, it is expressly stated that disposal of DU after deconversion could require additional environmental analysis (DEIS at 2-31, 4-58)—a process that is likely to lead to disclosure of the fact that disposal at the Envirocare site would not meet the dose limits of 10 CFR Part 61, Subpart C. See the July 2005 Report at 7-8.

y. The DOE Report appears to assume that no costs would be charged for disposition of hydrofluoric acid ("HF") generated in deconversion. (at 1-1). However, such is not a realistic assumption. (See FEIS at 2-29). This option clearly has costs that must be considered, as discussed above.

z. The actual cost of dispositioning DU safely and in a manner that will adequately protect public health and the environment is likely to fall in the range of $20.00 to $30.00 per kgU. Such cost considers the following factors:

aa. DU is generally unsuitable for near-surface disposal, because of its radiological and chemical properties. The WCS site or another near-surface disposal site (*e.g.*, Envirocare) will probably be unable to demonstrate compliance with Commission release limits for low-level waste disposal. It is likely that a strategy that requires a different disposal form, such as deconversion to DUO_2, and fabrication into a ceramic waste form *and* disposal of the waste in a deep geologic repository comparable to WIPP will be required. See November 2004 Report at 3-29, 47-51; July 2005 Report at 7-16, 22-24; NIRS/PC Petition for Leave to Intervene, at 28-31, 34-38, April 6, 2004. In their review of the management of depleted uranium, the International Atomic Energy Agency and the OCED's Nuclear Energy Agency noted that

> "The differing characteristics of various potential DU deconversion products [i.e. DU_3O_8 vs. DUO_2] can have a significant impact on the acceptability of these forms for disposal."[4]

These agencies went on to endorse the need for site-specific analysis of geologic disposal and concluded that

> "The design of final repositories, in particular the specific geological structure in each case, will ultimately define the requirements of the packaging and acceptable chemical forms of the depleted uranium"[5]

[4] A Joint Report by the OECD Nuclear Energy Agency and the International Atomic Energy Agency, "Management of Depleted Uranium," 2001 at 46.

[5] A Joint Report by the OECD Nuclear Energy Agency and the International Atomic Energy Agency, "Management of Depleted Uranium," 2001 at 23.

Therefore, cost estimates premised on the assumption of near-surface disposal will seriously understate the cost of such disposal. A more reliable cost estimate is one that assumes deep disposal in a repository analogous to the Waste Isolation Pilot Plant ("WIPP"). See the November 2004 Report at 35-51.

bb. LES's estimates of costs of deconversion and disposal do not sufficiently account for the costs of delays in licensing new radioactive waste treatment and disposal facilities. See Nov. 2004 Report at 42-44. For example, the WCS LLRW disposal site has no license as yet and is not expected to obtain a license until 2007. There is no deconversion plant as yet and no license proceeding is pending. The history of LLRW sites gives no reason to expect that licensing will be easy or expeditious. The licensing of a disposal site would also face serious uncertainties. The licensing of LLRW disposal facilities has encountered numerous problems in the past. For example, a disposal facility approved in 1993 and planned for construction in California was stopped when the Department of the Interior refused to transfer ownership of the federal land to the state as expected. Disposal sites in Ohio and Nebraska have also been abandoned by the Midwest and Central compacts, respectively[6]. A previous attempt to license a LLRW disposal site for the Texas Compact near Sierra Blanca was refused in 1998, following opposition

[6] Mark Holt, "Civilian Nuclear Waste Disposal", Congressional Research Service, Updated March 8, 2005 (Order Code IB92059) at CRS-12 to CRS-13.

by members of the local community and others[7]. In addition, it is likely that no near-surface disposal site can support disposal of DU from the NEF. Therefore, the problem facing LES is to obtain licensing for a deep disposal site for DU—an even more difficult task. The delay in licensing the WIPP facility is instructive here: The WIPP project commenced in the late 1970's and finally obtained EPA certification in 1998. Two decades is a reasonable estimate of the time that may be required for licensing such a repository.

5. What is the basis for, and purpose of, a "contingency factor"?

Response 5:

A contingency factor accounts for the possible impact of unforeseen risks that cannot be quantified in estimating future costs. See the November 2004 Report at 42-44.

6. What is the basis for, and purpose of, the requirement in 10 C.F.R. 70.25(e) that a decommissioning funding plan include "means for adjusting cost estimates and associated funding levels over the life of the facility"?

Response 6:

The mechanism in 10 CFR 70.25(e) for periodic adjustments in decommissioning cost estimates is to update estimates that were supportable and valid when made to account for newly emerging facts bearing on such estimates. It is not the purpose of the adjustment process to account for errors in estimating the cost of significant elements of the process of dispositioning DU that can be estimated, or allowed for, in the original estimate on the basis of which a license is granted. This is particularly the case when the financial assurance provisions are essentially the sole source of funds for DU dispositioning. See the discussion of this point in *Louisiana*

[7] Texas Commission on Environmental Quality, "Lineup of Legislation: Natural Outlook, Summer 2003: The TCEQ's playbook grows with new responsibilities, laws to implement," online at http://www.tceq.state.tx.us/AC/comm_exec/forms_pubs/pubs/pd/020/03/legislation.html.

Energy Services (Claiborne Enrichment Center), LBP-97-3, 45 NRC 99, 118-19 (March 7, 1977). There, the Board stated:

> "Finally, we note that, in contrast to the detailed final decommissioning plan that LES must submit near the end of the license term, the Applicant's Decommissioning Funding Plan is required only to provide a reasonable cost estimate to ensure that the Applicant sets aside adequate funds to cover, inter alia, the cost of tails disposal. The reasonableness of the Applicant's cost estimate is necessarily dependent upon all the circumstances and the Commission has indicated that "the plan must contain essential elements sufficient to ensure that a reasonable estimate of decommissioning costs can be made." Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), CLI-88-10, 28 NRC 573, 587 (1988). Here, the largest component of the Applicant's estimate for tails disposal is that for the conversion of DUF_6 to U_3O_8. As we have found, however, the Applicant's estimate has not properly accounted for neutralizing the byproduct HF as part of its estimate. This additional cost is substantial and it is not the type of expense, like an increase for inflation or the development of a new technology (see 50 Fed. Reg. 5600, 5604 (1985)), that merely should be added sometime in the future after one of the Applicant's periodic decommissioning funding reviews that the Applicant is committed to performing at least once every 5 years. (App. Exh. 1(e), at 7-1.) Rather, the neutralization of the byproduct HF produced as part of the conversion of DUF_6 to U_3O_8 is clearly an essential element of the conversion cost (and hence the tails disposal cost) that reasonably can be estimated at this time.
>
> Further, because the depleted uranium tails are created as the Applicant performs enrichment services, the Applicant's tails disposal funds must come from a portion of the price charged by LES for the separate work units ("SWUs") it performs. (Arnold Tr. 672-73; App. Exh. 4n, at 4; App. Exh. 1(a), at 11.8-15; Staff Exh. 1, at 15-21.) In order to provide reasonable assurance that there are adequate funds set aside to cover tails disposal, the Applicant must factor the realistic reasonable cost estimate of tails disposal into its market price for SWUs from the initiation of operations. (App. Exh. 4n at 4.) This is especially important in light of the nature of the enrichment market and the Applicant's financial structure. As we found in LBP-96-25, 44 NRC at 355-56, 359-60, 361, the enrichment market is a fiercely competitive, international one in which the supply of enrichment production capacity and the supply of enriched uranium far exceeds demand and this situation will prevail for the foreseeable future. In such a competitive market, a significant shortfall in the funds set aside to pay for tails disposal cannot simply be remedied by a price increase without harming the Applicant's competitive position and future market prospects. Moreover, unlike a utility reactor operator that can rely upon a public utility commission to set a rate structure adequate to recover all decommissioning costs even after the shutdown of a facility (see 53 Fed. Reg. 24,018, 24,031 (1988)), the Applicant's tails disposal funds can only be collected from its charges for enrichment services on an ongoing basis.
>
> In other words, LES must be totally self-reliant in paying for tails disposal. As we detailed in LBP-96-25, 44 NRC at 378-80, LES is a newly formed entity created to build

> and operate the CEC. It is structured as a limited partnership and LES has no significant independent assets. Id. at 398-99. Similarly, none of the LES general or limited partners are corporations of worth. Id. Further, under the LES Partnership Agreement, as well as general principles of corporate and partnership law, the corporate parents and other affiliates of the LES general and limited partners have no liability for the obligations of the partnership. Id. at 402 n. 30. In these circumstances, we cannot conclude that the Applicant's tails disposal estimate need only be a rough approximation that can be adjusted in the future upon periodic reviews by the Applicant. Rather, for the LES tails disposal estimate to be a reasonable one, it must include the substantial cost of neutralizing the HF from the conversion of DUF_6 to $U_3 O_8$."

Therefore, the estimate used as the basis for financial assurance for decommissioning must cover the future costs without allowing a risk to remain that the planned dispositioning cannot be carried out for lack of sufficient funds. See the November 2004 Report for further details.

Contention EC-6/TC-3 -- Costs of Management and Disposal of Depleted UF_6

1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.
2. Provide the educational and scientific expertise of each witness.

Response 1, 2:

The testifying expert will be Dr. Arjun Makhijani, whose resume is attached to the Petition.

3. Provide the subject matter on which each of the witnesses is expected to testify.

Response 3:

The subject matter on which Dr. Makhijani will testify in his direct testimony includes the estimates provided by LES of decommissioning costs, specifically, the costs of dispositioning of DU, as presented by LES in its Application and in certain supplemental submissions concerning such costs. The subject matter will include the contingency allowance, costs of capital, assumptions that DU is appropriate for near-surface disposal, and the absence of any estimate applicable to a disposal strategy chosen by LES. The subject matter will also include

the submissions made by LES in January through April 2005 to Commission Staff and the insufficiency of such submissions to support cost estimates. The subject matter will also include and the unavailability of an exhausted uranium mine for DU disposal, the lack of any specific proposal to dispose of DU in such a mine, and the likely inability of near-surface disposal methods, such as the engineered trench, to meet applicable release and dose limits. (See the November 2004 Report at 19-29, 35-51; July 2005 Report at 2-6, 22-24).

4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.

Response 4:

See the response, above, to LES's interrogatory concerning Contentions EC-3/TC-1 and EC-5/TC-2.

Proposed Contention EC-9

1. Provide the name, address, profession, employer, and area of professional expertise of each person whom NIRS/PC expects to call as a witness, including any expert witness at the hearing.
2. Provide the educational and scientific expertise of each witness.

Response 1, 2:

The testifying expert will be Dr. Arjun Makhijani, whose resume is attached to the Petition.

3. Provide the subject matter on which each of the witnesses is expected to testify.

Response 3:

Dr. Makhijani will testify in his direct testimony about the inadequacy and the absence of discussion of the impacts of DU disposal in the ER, the DEIS, and the FEIS.

4. Provide the substance of the facts and opinions to which each witness is expected to testify and a summary of the grounds for each opinion, including the documents and all pertinent pages or parts thereof upon which each witness will rely or will otherwise use for his testimony.

Response 4:

At present it is known that Dr. Makhijani will address the following matters in his direct testimony. Additional detail concerning the substance of Dr. Makhijani's testimony is contained in the NIRS/PC Motion dated July 5, 2005, seeking leave to file late-filed and supplemental contentions, the report annexed thereto (the July 2005 Report), and the November 2004 Report. Most of the documents to which Dr. Makhijani plans to refer are cited herein and in materials referred to in these responses. Additional items and demonstrative exhibits may be identified at the time provided in the schedule for submission of prefiled direct testimony. See also NIRS/PC's Response to Commission Staff's Interrogatories dated July 8, 2005, par. 23. The FEIS lacks any significant analysis of the impacts of DU disposal at Envirocare, WCS, or any near surface facility. Its analysis of uranium mine disposal has no demonstrable scientific basis and appears to be incorrect. See the November 2004 Report at 21-22; NIRS/PC Response to Commission Staff Interrogatories dated July 8, 2005, Response 23. The following matters will be covered in Dr. Makhijani's direct testimony:

a. There has been no analysis under NEPA of the application of provisions of 10 CFR Part 61 to DU. That is, there has been no analysis of the impact of considering DU to be "waste" within the terms of 10 CFR 61.2, of classifying DU within one or more of the classes created by 10 CFR 61.55, of imposing the dosage limits of 10 CFR Part 61, Subpart C, or of imposing upon DU any other provisions of 10 CFR Part 61. See the discussion in the July 2005 Report at 2-6.

b. The environmental impacts of deconversion and disposal of DU are essentially ignored in the FEIS. There is no analysis of the possible

deconversion of DUF_6 to DUO_2 rather than DU_3O_8. Conversion to DUO_2 provides advantages in disposal in comparison to DU_3O_8, in that it is more readily made into compact waste forms such as ceramics. Such a waste form should be considered in NEPA analysis as an appropriate alternative. See the November 2004 Report at 30-34.

c. The FEIS, unlike the DEIS, does not even suggest the need for additional environmental analysis of disposal of DU. See DEIS at 2-31, 4-58; FEIS at 2-31, 4-63. However, as shown in the July 2005 Report (at 7, 10-20), it is feasible to begin to analyze the performance of the WCS site and the Envirocare sites with respect to the disposal of DU.

d. The FEIS attempts to estimate the impact of disposal of DU from the NEF in its modeling of the releases from a generic granite or sandstone/basalt mine. (at 4-63 and Table 4-19). The FEIS fails to disclose the models used, the parameter values assumed, or other critical elements of the analysis. The text of the FEIS suggests that models used in analyzing the Claiborne site were used; however, the specific technical bases supporting these calculations have not been produced in this case and are apparently unavailable even to the Commission Staff. Further, the models address only two hypothetical disposal sites and fail to examine the performance of any actual location for disposal. Performance of a disposal site is highly site-specific, and analysis of hypothetical sites is of very little value in the context of a license application. See November 2004 Report at 21-23, 25-29; July 2005 Report at 22-24. It is also irrelevant to analyze mine disposal if such disposal is not, in fact,

intended to be carried out either as the Applicant's proposal or as an appropriate alternative.

e. Despite the indications that LES plans to put the DU into near-surface disposal at the proposed WCS facility and Staff's selection of disposal at the Envirocare site as their preferred option, Staff has presented no analysis of the environmental impacts of shallow land disposal. The DEIS had stated that additional environmental analyses could be required before disposal took place:

> "During its evaluation of the disposal of the depleted uranium in a licensed low-level radioactive waste disposal facility, the NRC staff determined that, depending on the quantity of material to be deposited, additional environmental impact evaluations of the proposed disposal site may be required." (DEIS at 2-31).

Likewise, Staff then said:

> "Final disposal of large quantities of depleted uranium at a licensed facility could require additional environmental impact evaluations depending on the location of the disposal facility and quantity of depleted uranium to be deposited." (DEIS at 4-58).

This position was consistent with the long-standing position of the Staff, the Commission, analysts at the National Laboratories, and the DOE. (see July 2005 Report at 2-6). However, despite this consensus, the Staff simply deleted these statements from the FEIS. Instead, the FEIS now states:

> "For example, under its Radioactive Materials License issued by the State of Utah, the Envirocare disposal facility is authorized to accept depleted uranium for disposal with no volume restrictions." (FEIS at 4-63)

Thus, there is no analysis of the environmental impact of waste disposal.

f. The FEIS points out the supposed viability of the Envirocare site, relying for data upon a staff memorandum of a conference call and a now outdated license

amendment. (Commission Hearing File Memorandum, April 6, 2005). Thus, even though the nature of LES's disposal plan has—apparently—fundamentally changed from the option of disposal in a mine as originally presented in the Application, Staff published a final EIS on June 15, 2005 that contains *no analysis* of the impacts of near-surface disposal at any site. (FEIS at 4-63). A valid analysis would show that the Envirocare site would not likely comply with the dose limit in 10 CFR Part 61, Subpart C. See the July 2005 Report at 7-8.

g. Indeed, in relation to the DOE option, Staff claims to rely upon the DOE EIS analyses of the Paducah and Portsmouth deconversion plants, but in those studies DOE specifically noted that environmental impacts of DU disposal had *not* been analyzed and that this must be done before any disposal decision is made. (LES Ex. 16 at 2-12; LES Ex. 17 at 2-11). Staff has ignored that example as well as its own long-standing position and the expressed intent of the Commission's January 18, 2005 ruling on the classification of DU. See the July 2005 Report at 2-6.

h. In issuing its 1998 guidance on disposal of long-lived radioactive wastes, the International Commission on Radiological Protection described the elements of a valid assessment of a proposed system of radioactive waste disposal:

> "Site specific assessments are essential in order to evaluate the radiological consequences of waste disposal. They are also necessary to understand, describe, quantify, and optimize the role of the different barriers of the disposal system and its subsystems. Assessments consider a number of scenarios where a scenario is defined as one possible combination of specified processes affecting the disposal system that could lead to radiological consequences. Typically, an assessment consists of the following elements, which are usually dealt with in an

> iterative manner: system understanding, scenario analysis, development of conceptual and detailed system models, consequence analysis, uncertainty and sensitivity analysis, and interpretation of the calculated results. An integrated assessment will evaluate the expected system evolution as well as less likely system evolutions including those caused by disruptive events of natural origin or as a result of human intrusion."[8]

Here, the Commission has a NEPA obligation to describe the details of the proposed plan for deconversion and disposal of DU and to analyze its environmental impacts and those of appropriate alternatives. Any complete analysis would include a well-founded modeling analysis of disposal of DU in a geologic repository. See the November 2004 Report at 21-29; July 2005 Report at 2-6, 22-24. This statutory obligation has not been fulfilled.

[8] International Commission on Radiological Protection, *Radiation Protection Recommendations as Applied to the Disposal of Long-Lived Solid Radioactive Waste.* Annals of the ICRP, v. 28, no. 4. ICRP Publication 81. Kidlington, Oxford; Tarrytown, N.Y.: Pergamon, 1998, at 7.

The foregoing answers are true and correct to the best of my knowledge and belief.

_____

Michael Mariotte
Executive Director
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Respectfully submitted,

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July 19, 2005

CERTIFICATE OF SERVICE

Pursuant to 10 CFR § 2.305 the undersigned attorney of record certifies that on July 19, 2005, the foregoing Responses on Behalf of Intervenors Nuclear Information and Resource Service and Public Citizen to Applicant's Interrogatories dated July 8, 2005 was served by electronic mail and by first class mail upon the following:

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