



HITACHI

Global Laser Enrichment

Albert E. Kennedy, Manager
GLE Environmental, Health, & Safety
P. O. Box 780 – M/C L-65
Wilmington, NC 28402 USA
T 910-819-1925
F 910-342-5925
AlbertE.Kennedy@ge.com

MFN-09-578
September 4, 2009

Attn: Document Control Desk
Michael Weber, Director
Office of Nuclear Materials Safety & Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: **RESPONSE TO AUGUST 6, 2009 ACCEPTANCE LETTER FOR GLOBAL LASER ENRICHMENT LICENSE APPLICATION**

Dear Mr. Weber:

GE-Hitachi Global Laser Enrichment LLC (GLE) hereby submits the additional information requested in the August 6, 2009 letter that contained the results of the NRC acceptance review of the GLE license application. Enclosure 1 of this letter contains the responses to the eight questions.

Two separate documents, containing information to assist in responding the questions, will be submitted under separate covers as one contains Proprietary, Export-Controlled, and Security-Related Information, and the other contains Classified Information.

If there are any questions regarding this letter and its contents, please do not hesitate to contact myself, or Julie Olivier of my staff at 910-819-4799 or at Julie.Olivier@ge.com.

Sincerely,

 For AEK

Albert E. Kennedy
Manager, GLE Environmental, Health, & Safety

Docket No. 70-7016

NUM5501

References:

1. Letter, Timothy C. Johnson (NRC) to Albert Kennedy (GLE), "ACCEPTANCE OF GENERAL ELECTRIC-HITACHI GLOBAL LASER ENRICHMENT APPLICATION FOR A LASER-BASED URANIUM ENRICHMENT FACILITY", August 6, 2009.

Enclosures:

1. Response to Questions 1 through 8 of the August 8, 2009 NRC letter

Cc (without enclosures):

Tim Johnson (NRC)
Brian Smith (NRC)
Keith Everly (NRC)
Tammy Orr (GLE)
Lori Butler (GEH)
Jerry Head (GEH)
Patricia Campbell (GEH)
Bob Crate (GLE)
Ken Givens (GLE)
Tom Owens (GLE)
MFN-09-578

ENCLOSURE 1

of

MFN-09-578

Response to Questions 1 through 8 of the August 8, 2009 NRC letter

(5 pages total including this cover sheet)

September 4, 2009

1. In Section 3.3 of the application, "Structural Design Criteria," General Electric-Hitachi Global Laser Enrichment (GEH) indicated that it was in the process of performing the Initial Site Geophysical/Geotechnical Investigation to access the soil condition in order to make an engineering analysis to determine the structural in-ground support system necessary to support the estimated heavy loading. Provide the results of the Site Geophysical/Geotechnical Investigation and final foundation.

The GLE Environmental Report (submitted to the NRC on January 30, 2009) provides additional detailed information on the geophysical and geotechnical investigations performed in the GLE Study Area (Chapter 3, Section 3.3.5 and Chapter 4, Section 4.3.2 of the Environmental Report). A number of the appendices provide more information on the field and laboratory testing, and other related information (e.g., Appendix D – Information on the USGS Assessment of the Cape Fear Arch Tectonic Feature, Appendix E – Official Soil Series Descriptions for Soils within the GLE Study Area, Appendix F – Soil Test Boring Records in GLE Study Area, Appendix G – Results of the 2007 Preliminary Subsurface Investigation, Appendix H – Summary of Unified Soil Classification System, and Appendix I – Historical Earthquakes Ranked by Distance from the Wilmington Site).

The information in the above documents should provide a substantive understanding of the geophysical and geotechnical conditions of the GLE Study Area. The preliminary geophysical and geotechnical investigation performed in 2007 was for general planning purposes and used to assess the feasibility of developing this portion of the Wilmington site (the GLE Study Area). The conclusions drawn from the preliminary geophysical and geotechnical investigations are as follows:

- *The liquefaction potential of subsurface materials within the GLE Study Area was evaluated through field and laboratory tests, and the potential for these materials to liquefy and have an impact on the GLE facility is SMALL.*
- *Foundations would be designed to meet building codes and to control impacts from seismic events, as well as predicted settlement from projected building loads.*

The first paragraph of Section 3.3 in the ISA Summary will be revised to read as follows:

"Previous geotechnical investigations on the Wilmington Site found that soil conditions required the use of a specialized structural in-ground support system. A geotechnical design investigation to determine the structural in-ground support system necessary to support the estimated heavy loading will be completed prior to commencement of construction. The geotechnical design investigation will be performed using the applicable regulatory guidance in Regulatory Guide 1.132, Site Investigations for Foundations of Nuclear Power Plants."

When the geotechnical design investigation is completed, the NRC will be notified and the results will be available to the NRC for inspection, or they can be submitted to the NRC upon request.

In addition, using the soil information from the geotechnical design investigation, the following activities will be conducted (the license application will be revised to incorporate these commitments):

- *The assessment of liquefaction potential of subsurface soils will be completed using the applicable guidance contained in Regulatory Guide 1.198, Procedures*

and Criteria for Assessing Seismic Soil Liquefaction at Nuclear Power Plant Sites. *The Ground Motion Response Spectra used for the liquefaction analysis will be based on guidance contained in the International Building Code.*

- *Allowable bearing pressures for shallow and deep foundations will be evaluated using established geotechnical engineering methods. Methods anticipated for use include those contained in the following publications: Naval Facilities Engineering Command Design Manual, NAVFAC DM 7; Foundation Engineering Handbook, H.F. Winterkorn and H.Y Fang; Foundation Analysis and Design, J. E. Bowles; and Drilled Shafts: Construction Procedures and Design Methods, Federal Highway Administration.*
- *The evaluation of total and differential settlement for structure foundations will be completed using established geotechnical engineering methods. Methods anticipated for use include those contained in the following publications: Naval Facilities Engineering Command Design Manual, NAVFAC DM 7; Foundation Engineering Handbook, H.F. Winterkorn and H.Y Fang; and Foundation Analysis and Design, J. E. Bowles.*

2. Provide the validation report for the computer codes used for criticality safety.

The criticality validation report is provided in a separate submittal as it contains Proprietary Information and is withheld from public disclosure.

3. In the Integrated Safety Analysis (ISA) Summary, human factors is listed as a type of management measure applied to items relied on for safety (IROFS). In addition, it states that procedures will be verified and validated prior to initial use to ensure that no technical errors or human factor issues were inadvertently introduced during the procedure development or review process. Provide a description of the guidance documents that will be utilized for performing these reviews (e.g., NUREG-0700 and 0711) and any human factors methods that will be used to implement the guidance in the design of the facility.

Procedures undergo verification and validation to confirm that there are no human factor issues (as well as no technical errors) introduced into the procedures during their development and review. As indicated below, it is during the validation activity where human factor issues may be identified. The conduct of the validation may be performed in the field in the proximity of the equipment, process, and/or activity involved. The process utilized to produce procedures including identifying what activities should be under procedural control, the development, verification and validation, review, approval, issuance, and distribution is presented in the LA §11.4.2 and subsections thereto. The applicable guidance in NUREG-0700, Human-System Interface Design Review Guidelines, and NUREG-0711, Human Factors Engineering Program Review Model will be used to perform the procedural verification and validation. The following insert shall be incorporated into the License Application, Section 11.4.2.3:

“The applicable guidance in NUREG-0700, Human-System Interface Design Review Guidelines, and NUREG-0711, Human Factors Engineering Program Review Model will be used to perform the procedural verification and validation.”

Human factors and human/machine interface considerations are applied to the design process at various points, based on a graded approach. Specifically, human factors and human/machine interface considerations are addressed for QL-1 and QL-2 level items. If the potential for human error or human initiated events exist that result in substantive

consequences, then formal evaluation and process, equipment, or administrative changes are considered. Areas where human involvement may be considered include the design of equipment, layout of areas, and determination of the potential for errors during human actions. Additionally, during the evaluation of equipment that is selected as an IROFS, human factors and/or human/machine interface considerations are often involved to determine the reliability of the IROFS. Human factors were accounted for during the determination of initiating event frequencies and IROFS failure frequencies used in the ISA process and are documented in the ISA Baseline documents. Since the approach to be applied is conditional to the potential consequence or specific IROFS, the design process varies. A more detailed human factors analysis for IROFS will be documented in the individual IROFS boundary packages, to be developed later in the design phase. The procedure for developing the IROFS boundary packages, including a description of the human factors graded approach analysis will be submitted to the NRC for review, once it is completed. For IROFS, GLE will use the applicable guidance in NUREG-0700, Human-System Interface Design Review Guidelines; and NUREG-0711, Human Factors Engineering Program Review Model. Depending on human factors and human/machine interfaces identified, consideration to any of the following guidance documents may be applied during detailed design:

- NUREG-1278, Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant applications; and
- DOE EH-33, Barrier and hazard Analysis Guidance Document.

The following insert shall be incorporated into the License Application, Section 3.2.5.8:

“For IROFS, a human factors engineering review of the human-system interfaces shall be conducted using the applicable guidance in NUREG-0700, Human-System Interface Design Review Guidelines; and NUREG-0711, Human factors Engineering Program Review Model. The results of this review will be documented in the IROFS boundary packages, to be prepared later in the design phase.”

4. Provide more detailed information for the ISA Summary that demonstrates compliance with the criticality accident alarm system (CAAS) requirements of 10 CFR 70.24 and 10 CFR 70.65(b)(4). Specifically,
 - a. Describe the method for evaluating an acceptable response of at least two detectors to a nuclear criticality at any location where special nuclear material (SNM) may be handled, used, or stored.
 - b. Provide a diagram of locations of all detectors relative to the potential locations of SNM.
 - c. Provide information supporting determination of the gamma and neutron emission characteristics of the minimum credible accident of concern capable of producing the effects specified in Title 10 of the *Code of Federal Regulations* (10 CFR) 70.24.
 - d. Provide information showing the response characteristics of the detectors to neutron and gamma doses and rates characteristic of credible accidents.

The response to Question 4 is provided in a separate submittal as it contains Proprietary and Security-Related information and is withheld from public disclosure.

5. Provide information that describes the assumptions and conditions under which the electrical power supply and distribution system for the proposed facility is relied on to accomplish the performance objectives for the facility. Provide information that describes how

management measures for the electrical systems and components identified in the ISA Summary will ensure that they will be designed, implemented, and maintained to ensure they are available and reliable when needed. Describe management measures that ensure that these power supply systems will [be] designed, implemented, and maintained to ensure they are available and reliable when needed.

The response to Question 5 is provided in a separate submittal as it contains Proprietary, Export-Controlled, and Security-Related information and is withheld from public disclosure.

6. Provide information that describes the assumptions and conditions under which proposed instrumentation and controls used as IROFS are relied upon to support compliance with the performance requirements for the facility. Include in the ISA Summary information describing the function and operation of instrumentation and control systems and components that are relied on to accomplish safety actions. It is insufficient to describe IROFS by simply listing a parameter that will be monitored by instruments and controls.

The response to Question 6 is provided in a separate submittal as it contains Proprietary, Export-Controlled, and Security-Related information and is withheld from public disclosure.

7. Provide information that describes how a safety action associated with the event sequence that is prevented or mitigated by the identified parameter will be developed from a logic decision/action performed by the instrumentation and control devices associated with that monitored parameter, in sufficient detail to understand its functions in relation to the performance objectives, including the management measures that ensure that these devices used as IROFS will be designed, implemented, and maintained to ensure they are available and reliable when needed. Describe provisions for adequate testing, inspection, and maintenance of instrumentation and control devices.

The response to Question 7 is provided in a separate submittal as it contains Proprietary, Export-Controlled, and Security-Related information and is withheld from public disclosure.

8. Revise the Standard Practice Procedures Plan for the Protection of Classified Matter (SPPP) to be a self-contained document. The submitted document contains cross references to information in other documents, which is inconsistent with the SPPP standard format guide. For example, cross references are made to the Physical Security Plan and Transportation Security Plan. The applicable information should be provided in the SPPP so that it contains all the information needed to demonstrate compliance with 10 CFR Part 95.

The revised SPPP is provided in a separate submittal as it contains Security-Related Information and is withheld from public disclosure.