

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
PRIVATE FUEL STORAGE, LLC)	Docket No. 72-22-ISFSI
)	
(Independent Spent)	
Fuel Storage Installation))	

NRC STAFF’S OBJECTIONS AND RESPONSES
TO THE “STATE OF UTAH’S TWENTIETH SET OF
DISCOVERY REQUESTS DIRECTED TO THE NRC STAFF”

INTRODUCTION

On February 15, 2002, the State of Utah (“State”) filed the “State of Utah’s Twentieth Set of Discovery Requests Directed to the NRC Staff” (“Twentieth Request” or “Request”), concerning the application for an Independent Spent Fuel Storage Installation (“ISFSI”) filed by Private Fuel Storage, L.L.C. (“PFS” or “Applicant”). In its Request, the State filed (a) five general interrogatories and two general document requests concerning its admitted contentions in this proceeding, in addition to (c) six requests for admission, (d) ten interrogatories, and (e) five document requests concerning Unified Contention Utah L/QQ (geotechnical issues). The NRC Staff (“Staff”) hereby files its objections and responses to the State’s Twentieth Request,¹ as follows.²

¹ These objections and responses are filed pursuant to a two-day extension of time agreed to by Counsel for the State.

² The Staff’s answers to the State’s requests for admissions and interrogatories are supported by the “Joint Affidavit of Goodluck I. Ofoegbu and Daniel J. Pomerening,” attached hereto; objections are stated by Counsel.

GENERAL OBJECTIONS

Objection 1. The Staff objects to each of the State's discovery requests, in that the State has not complied with the Commission's regulations that govern discovery from the Staff. In this regard, it is well established that discovery against the Staff rests on a different footing than discovery in general. *Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-634, 13 NRC 96, 97-98 (1981)*. While discovery from parties in an NRC adjudicatory proceeding is generally governed by the provisions of 10 C.F.R. § 2.740 *et seq.*, interrogatory and document discovery against the Staff is governed by the provisions of 10 C.F.R. §§ 2.720(h)(ii)-(iii), 2.744 and 2.790.³ These regulations establish certain limits to the Staff's obligation to respond to discovery requests. In particular, with regard to interrogatories, the Commission's rules provide:

[A] party may file with the presiding officer written interrogatories to be answered by NRC personnel with knowledge of the facts designated by the Executive Director for Operations. Upon a finding by the presiding officer that answers to the interrogatories are necessary to a proper decision in the proceeding and that answers to the interrogatories are not reasonably obtainable from any other source, the presiding officer may require that the staff answer the interrogatories.

10 C.F.R. § 2.720(h)(2)(ii). With regard to requests for the production of documents, the Commission's rules similarly provide:

(a) A request for the production of an NRC record or document not available pursuant to 10 C.F.R. § 2.790 . . . shall set forth the records or documents requested, either by individual item or by category, and shall describe each item or category with reasonable particularity and shall state why that record or document is relevant to the proceeding.

(b) If the Executive Director for Operations objects to producing a requested record or document on the ground that (1) it is not relevant or (2) it is exempted from disclosure under § 2.790 and the disclosure is not necessary to a proper decision in the proceeding or

³ See also 10 C.F.R. §§ 2.740(f)(3), 2.740a(j), 2.740b(a), and 2.741(e) (excluding discovery from the Staff from the general provisions of those regulations).

the document or the information therein is reasonably obtainable from another source, he shall so advise the requesting party.

10 C.F.R. § 2.744(b). Finally, it is an adequate response to *any* discovery request for a party to state that the information or document requested is available in the public domain and to provide information to locate the material requested. 10 C.F.R. § 2.740(b)(1); *accord*, *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 NRC 141, 147-148 (1979).

Here, the State has not complied with the Commission's requirements governing discovery against the Staff. First, the State has not indicated that the requested information is not available in the public domain. Indeed, some of the information requested by the State is available to the public in the Commission's Public Document Room (PDR), or has previously been provided to the State. Further, the State has not indicated that the requested information is exempt from disclosure under 10 C.F.R. § 2.790 or that it cannot obtain the documents from public sources. Similarly, to the extent that any documents may be exempt from disclosure, the State has not explained why any such exempt items are necessary to a proper decision in the proceeding.⁴

Objection 2. The Staff objects to each of the State's discovery requests, insofar as they request information that is not relevant to the issues in this proceeding and/or that exceeds the scope of admitted unified contention Utah L/QQ in this proceeding.

Objection 3. The Staff objects to the State's discovery requests insofar as they relate to matters which are outside the jurisdiction of the NRC and/or are beyond the proper scope of this proceeding.

Objection 4. The Staff objects to each of the State's discovery requests, insofar as they seek to impose an obligation to respond that is different from or greater than the obligations

⁴ In addition, to the extent that the instant discovery requests seek information that has been withheld from public disclosure as proprietary information, the State has been afforded access to that material by the Applicant under a confidentiality agreement, and the State has shown no reason why it could not obtain the requested information from the Applicant.

imposed by Commission requirements in 10 C.F.R. Part 2. *See, e.g.*, “Instruction B” (“Supplemental Responses”) (Request at 2).

Objection 5. The Staff objects to each of the State’s discovery requests, insofar as they may request information or documents from the “Nuclear Regulatory Commission,” “NRC,” or other persons or entities who are not NRC Staff members or consultants in this proceeding. *See, e.g.*, “Definition A” (Request at 3). The NRC and persons other than Staff members (*e.g.*, Commissioners, Commissioners’ Assistants, Licensing Board members, ACRS members, etc.) are not parties to this proceeding and are not properly subject to the State’s requests for discovery.

Objection 6. The Staff objects to each of the State’s discovery requests, insofar as they request personal information such as the home address and telephone numbers of persons employed by or affiliated with the Staff, and which may be protected from disclosure under 10 C.F.R. § 2.790(a). *See, e.g.*, “Definition E.1” (“describe” or “identify”) (Request at 5).

Objection 7. The Staff objects to each of the State’s discovery requests as unduly burdensome insofar as they request that descriptions of documents are to include the name of “the person or persons having possession and/or copies thereof, the person or persons to whom the document was sent, all persons who reviewed the document, the substance and nature of the document, [and] the present custodian of the document . . . *See* Definition E.2 (“describe” or “identify”) (Request at 5).

Objection 8. The Staff objects to each of the State’s discovery requests as unduly burdensome insofar as they request that descriptions of “any activity, occurrence, or communication” are to include the identity “of each person alleged to have had any involvement with or knowledge of the activity, occurrence, or communication, and the identity of any document recording or documenting such activity, occurrence, or communication.” *See* Definition E.4 (“describe” or “identify”) (Request at 6).

Objection 9. The Staff objects to each of the State's discovery requests as unduly burdensome, and irrelevant and not calculated to lead to the discovery of admissible evidence, insofar as they request the discovery of "material contained in, or which might be derived or ascertained from, the personal files of NRC Staff employees, representatives, investigators, and agents." See Definition L (Request at 7).

Objection 10. The Staff objects to each of the State's discovery requests, insofar as they may request information pertaining to or copies of intra-agency memoranda, notes and other pre-decisional materials; or information or documents protected under the attorney-client privilege, the doctrines governing the disclosure of attorney work product and trial preparation materials, and/or any other privilege or exemption that warrants or permits the non-disclosure of documents under the Freedom of Information Act, as set forth in 10 C.F.R. § 2.790(a). Notwithstanding this objection, to the extent, if any, that documents are requested in the State's Twentieth Request, the Staff will prepare a privilege log to identify documents that are sought to be withheld from discovery as privileged or exempt from disclosure, and will produce that log to the State.

RESPONSES TO DISCOVERY REQUESTS

Notwithstanding the above objections to the State's Twentieth Request, and without waiving these objections or its right to interpose these or other objections in the future, the Staff hereby states the following additional objections and responses to the State's Request.

A. GENERAL DISCOVERY

GENERAL INTERROGATORIES

GENERAL INTERROGATORY NO. 1 State the name, business address, and job title of each person who was consulted and/or who supplied information for responding to interrogatories, requests for admissions and requests for the production of documents. Specifically note for which interrogatories, requests for admissions and requests for production each such person was consulted and/or supplied information.

If the information or opinions of anyone who was consulted in connection with your response to an interrogatory or request for admission differs from your written answer to the discovery request, please describe in detail the differing information or opinions, and indicate why such differing information or opinions are not your official position as expressed in your written answer to the request.

STAFF RESPONSE. See Response to General Interrogatory Nos. 2-5, *infra*, and the objections stated therein, which are incorporated by reference in response to this interrogatory. In addition, the Staff objects to this interrogatory to the extent that it seeks information that is exempt from disclosure under 10 C.F.R. § 2.790, including without limitation predecisional information. Notwithstanding (and without waiving) these objections, the following information is provided with respect to the specific contention that is the subject of the State's Twentieth Request.

In addition to Staff Counsel, the following persons were consulted and/or provided information in responding to the State's Twentieth Request:

Utah L/QQ:

Goodluck I. Ofoegbu
Senior Research Engineer
Center for Nuclear Waste Regulatory Analyses
Southwest Research Institute
6220 Culebra Rd.
San Antonio, TX 78238
(Requests for Admission Nos. 1-6; Interrogatories Nos. 1-5 and 7-9)

Dan J. Pomerening
Principal Engineer
Mechanical and Materials Engineering Division
6220 Culebra Rd.
San Antonio, TX 78238
(Requests for Admission Nos. 1-4; Interrogatories Nos. 1, 6, 8, 10)

GENERAL INTERROGATORY NO. 2. To the extent that the Staff has not previously produced documents relevant to any Utah admitted contention, including without limitation unified contention Utah L/QQ, identify all such documents not previously produced.

GENERAL INTERROGATORY NO. 3. For each admitted Utah contention, including without limitation unified contention Utah L/QQ, give the name, address, profession, employer, area of professional

expertise, and educational and scientific experience of each person whom the Staff expects to call as a witness at the hearing. For purposes of answering this interrogatory, the educational and scientific experience of expected witnesses may be provided by a resume of the person attached to the response.

GENERAL INTERROGATORY NO. 4. For each admitted Utah contention, including without limitation unified contention Utah L/QQ, identify the qualifications of each expert witness whom the Staff expects to call at the hearing, including but not limited to a list of all publications authored by the witness within the preceding ten years and a listing of any other cases in which the witness has testified as an expert at a trial, hearing or by deposition within the preceding four years.

GENERAL INTERROGATORY NO. 5. For each admitted Utah contention, including without limitation unified contention Utah L/QQ, describe the subject matter on which each of the witnesses is expected to testify at the hearing, describe the facts and opinions to which each witness is expected to testify, including a summary of the grounds for each opinion, and identify the documents (including all pertinent pages or parts thereof), data or other information which each witness has reviewed and considered, or is expected to consider or to rely on for his or her testimony.

STAFF RESPONSE. The Staff objects to these requests as unnecessarily burdensome and duplicative. These interrogatories, which pertain to all of the State's admitted contentions, reiterate, almost *verbatim*, the general interrogatories contained in the "State of Utah's First Set of Discovery Requests Directed to the NRC Staff" ("First Request"), dated June 10, 1999.⁵ Indeed, the State has repeatedly issued these general interrogatories throughout the discovery process,⁶ and it appears to have intended to restate those earlier interrogatories herein. The Staff objects

⁵ The two sets of general interrogatories differ only to the extent that the State's Twentieth Request (1) asks the Staff, in General Interrogatory No. 2, to identify those documents "relevant to any Utah admitted contention" (as opposed to "relevant to any Utah admitted contention upon which the NRC Staff intends to rely in litigating each Utah contention"), but limits this request to those documents "not previously produced;" and (2) expands the requests contained in General Interrogatory Nos. 2-5 to include Unified Contention Utah L/QQ (through the addition of the phrase "including without limitation unified contention Utah L/QQ").

⁶ See, e.g., "State of Utah's Sixth Set of Discovery Requests Directed to the NRC Staff (Utah Contention L)," dated February 4, 2000; "State of Utah's Seventh Set of Discovery Requests Directed to the NRC Staff," dated August 31, 2000.

to being served with two or more requests to respond to the same interrogatories, as repetitious and burdensome. Notwithstanding this objection, however, the Staff will review its answers to the State's First Request, and will provide a supplement thereto, to the extent necessary and appropriate under the Commission's regulations.⁷ Further, with respect to the Unified Contention Utah L/QQ, the Staff will provide in a supplement to this Response the requested information concerning each person that the Staff expects to call as a witness at the hearing.

GENERAL DOCUMENT REQUESTS

The State requests the Staff to produce the following documents directly or indirectly within its possession, custody or control to the extent not previously produced by the Staff during discovery:

REQUEST NO 1. All documents in your possession, custody or control identified, referred to, relied on, or used in any way in (a) responding to the interrogatories and requests for admissions set forth in the State's previous sets of Formal Discovery Requests to the Staff, (b) responding to the following interrogatories and requests for admissions in this document, or (c) responding to any subsequent interrogatories and requests for admissions filed with respect to the State's Contentions as admitted by the Board.

STAFF RESPONSE. The Staff objects to this request on the grounds that (1) to the extent it seeks the production of documents within the scope of the State's interrogatories and requests for admission, it (i) is vague and ambiguous insofar as the interrogatories and requests for admission are vague and ambiguous, (ii) seeks to discover information that is beyond the scope of each Utah contention, as admitted (including without limitation, Unified Contention Utah L/QQ, as admitted), and (iii) is irrelevant and not reasonably calculated to lead to the discovery of

⁷ To date, the Staff has supplemented its responses to the State's First Request on four separate occasions. See (1) "NRC Staff's First Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated July 13, 1999; (2) "NRC Staff's Second Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated August 20, 1999; and (3) "NRC Staff's Third Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated April 5, 2000; and (4) "NRC Staff's Fourth Supplemental Response to 'The State of Utah's First Set of Discovery Requests Directed to the NRC Staff,'" dated February 13, 2002

admissible evidence in this proceeding; (2) insofar as it pertains to the “State’s previous sets of Formal Discovery Requests,” it is repetitious and burdensome; and (3) the State has not demonstrated that the information requested could not have been obtained from other sources, including, without limitation, the Commission’s PDR, documents submitted by PFS in this proceeding, and/or the Staff’s Safety Evaluation Report Concerning the Private Fuel Storage Facility (“SER”) and Supplement No. 2 thereto. Notwithstanding (and without waiving) these objections, documents will be produced to the extent that such documents (a) are not objected to, (b) are not otherwise available from other sources, and (c) are not draft, predecisional and/or privileged documents that are exempt from disclosure under 10 C.F.R. § 2.790, in which case they will be identified in a privilege log.

REQUEST NO. 2. All documents (including experts’ opinions, workpapers, affidavits, and other materials used to render such opinion) supporting or otherwise relating to testimony or evidence that you intend to use at the hearings on each Utah admitted contention, including without limitation unified contention Utah L/QQ.

STAFF RESPONSE. See General Objection 10 and Response to Document Request No. 1, *supra*. In addition, the Staff objects to this request on the ground that the Staff has not yet prepared testimony for use at the hearing on unified contention Utah L/QQ, nor has the Staff identified documents relating to such testimony or evidence, and, accordingly, the Staff cannot produce such documents at this time. Notwithstanding (and without waiving) these objections, documents will be produced to the extent that such documents (a) are not objected to, (b) are not otherwise available from other sources, and (c) are not draft, predecisional and/or privileged documents that are exempt from disclosure under 10 C.F.R. § 2.790, in which case they will be identified in a privilege log.

B. CONTENTION UTAH QQ - GEOTECHNICAL⁸

1. Requests for Admission

REQUEST FOR ADMISSION NO. 1. Do you admit that the Staff finds that the survivability and durability of the cement-treated soil that PFS intends to use for the redesigned Canister Transfer Building (“CTB”) and storage pad foundation systems [sic] are acceptable?

STAFF RESPONSE. The Staff objects to this request on the ground that it is vague and ambiguous insofar as the terms “survivability” and “durability” are not defined in this Request. Notwithstanding this objection, the Staff states as follows: Yes.

REQUEST FOR ADMISSION NO. 2. Do you admit that PFS has not presented to the Staff any results of soil-cement testing, including durability, strength and dynamic properties testing, for the storage pads and CTB areas?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous insofar as it uses the phrase “durability, strength and dynamic properties testing,” and (2) constitutes an improper compound question insofar as it refers to three types of testing -- “durability, strength, and dynamic properties testing” -- with respect to both the “storage pads” and “CTB areas.” Notwithstanding these objections, the Staff states as follows: Yes.

⁸ The Staff notes that the State has impermissibly attempted to expand the number of interrogatories it is permitted to file, by unilaterally asserting that “Utah QQ has not been consolidated into Unified Contention Utah L/ QQ” (Request at 10). In fact, Contention Utah QQ has been merged with Contention Utah L, as the State knows. The State has already filed 25 interrogatories against the Staff concerning Parts A and B of Contention Utah L, including 20 interrogatories which it was permitted to file under the Licensing Board’s procedural rulings, and five additional interrogatories which the Staff voluntarily agreed to answer. The Staff considers that the State’s current filing of ten additional interrogatories on Contention Utah QQ exceeds the number of interrogatories it is permitted to file on Unified Contention L/ QQ. Notwithstanding (and without waiving) this objection, however, in the interest of cooperation, the Staff herewith voluntarily responds to the State’s interrogatories, now that Contention Utah QQ has been admitted for litigation as part of this unified contention.

REQUEST FOR ADMISSION NO. 3. Do you admit that PFS has not presented to the Staff any site-specific testing or soil-structure interaction analyses to show that cement-treated soil will provide resististance [sic] to dynamic seismic loadings for the CTB foundation?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous in its use of the phrases “any site-specific testing or soil-structure interaction analyses” and “dynamic seismic loadings,” and (2) constitutes an improper compound question insofar as it refers to both “site-specific testing” and “soil-structure interaction analyses.” Notwithstanding these objections, the Staff states as follows: No.

REQUEST FOR ADMISSION NO. 4. Do you admit that PFS has not presented to the Staff any site-specific testing or soil-structure interaction analyses with respect to PFS’s intended use of cement-treated soil under and around the storage pads?

STAFF RESPONSE. See Response to Request for Admission No. 3, *supra*.

REQUEST FOR ADMISSION NO. 5. Do you admit that PFS has not presented to the Staff evaluations or analyses of the long term behavior of cement-treated soil under operational loading (e.g., cask transport vehicle) and environmental factors (e.g., curing, shrinkage, frost, dessication, salt and sulfide attack) over the proposed 40 year life of the facility?

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous insofar as it fails to specify the nature, type or format of the “evaluations” or “analyses” that are the subject of this request, and insofar as it uses the phrase, “long-term behavior of soil-cement under operational loading [] and environmental factors [];” (2) constitutes an improper compound question insofar as it refers to both “operational loading” and “environmental factors;” and (3) is misleading in its use of the phrase “proposed 40 year life of the facility” in that, if licensed, the proposed PFS ISFSI will be licensed for a period of 20 years pursuant to 10 C.F.R. § 72.42(a). Notwithstanding these objections, the Staff states as follows: No.

REQUEST FOR ADMISSION NO. 6. Do you admit that PFS has not presented to the Staff cone penetration test (“CPT”) data from the ISFSI site?

STAFF RESPONSE. No. See SSER No. 2, at 39-40, 54.

2. Interrogatories

INTERROGATORY NO. 1. Describe with specificity whether or not the Staff finds acceptable PFS’s application of its revised PSHA design basis ground motions to the Canister Transfer Building and its foundation and the basis thereof. See e.g, NRC Staff’s Response to “State of Utah’s Request for Admission of Late-Filed Contention Utah QQ (Seismic Stability)” dated May 30, 2001 at 6-7.

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous; (2) constitutes an improper compound and confusing question insofar as it refers to both the “Canister Transfer Building” and its “foundation;” and (3) is overly broad and unduly burdensome, insofar as the citation provided in this interrogatory, in fact, constitutes a reference to multiple pages of the State’s proposed Contention Utah QQ and extensive materials filed in support thereof -- such that the State is effectively requesting that the Staff address, in a single interrogatory answer, multiple areas of concern raised by the State in support of its May 16, 2001 proposed late-filed Contention Utah QQ.⁹

Notwithstanding (and without waiving) these objections, the Staff states as follows: The Staff has determined that the design of the Canister Transfer Building (CTB) proposed by PFS satisfies the requirements of 10 C.F.R. § 72.122(b), given the design of the CTB to withstand the

⁹ Interrogatory No. 1 of the State’s Twentieth Request cites pages 6-7 of the “NRC Staff’s Response to ‘State of Utah’s Request for Admission of Late-Filed Contention Utah QQ (Seismic Stability),’” dated May 30, 2001 (“Staff’s Response”). However, these references in the Staff’s Response, for the most part, simply reiterate the areas of concern or bases identified by the State in support of its proposed late-filed Contention Utah QQ; they do not contain any Staff assessment of the merits of the State’s proposed late-filed Contention Utah QQ or the acceptability of “PFS’s application of its revised PSHA design basis ground motions to the Canister Transfer Building and its foundation.” See Staff’s Response, at 6-7 (quoting in large part the “State of Utah’s Request for Admission of Late-Filed Contention Utah QQ (Seismic Stability),” dated May 16, 2001, at 8-15.

2,000-year return-period earthquake for the facility. The basis for the Staff's finding is provided, *inter alia*, in the following sections of SER Supplement No. 2: Section 2.1.6.4 ("Stability of Subsurface Materials"); Section 4.1.3.2 ("Structural," specifically revised Table 4-6 and the revised paragraph entitled "Seismicity"); Sections 5.1.3.1 and 4 ("Description of Reinforced Concrete Structures" and "Structural Analysis for Reinforced Concrete Structures," specifically the discussion under the subsections entitled "Canister Transfer Building"); and Section 15.1.2.6 ("Earthquake," specifically the discussion of accident analyses).

INTERROGATORY NO. 2: Describe with specificity whether or not the Staff finds acceptable PFS's application of its revised PSHA design basis ground motions to the storage cask, storage pads and the foundations of the pads and the basis thereof. See *e.g.*, id.

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous; (2) constitutes an improper compound and confusing question insofar as it refers to the "storage cask, storage pads and foundations of the pads;" and (3) is overly broad and unduly burdensome, insofar as the citation provided in this interrogatory, in fact, constitutes a reference to multiple pages of the State's proposed Contention Utah QQ and extensive materials filed in support thereof -- such that the State is effectively requesting that the Staff address, in a single interrogatory answer, multiple areas of concern raised by the State in support of its May 16, 2001 proposed late-filed Contention Utah QQ. See Response to Interrogatory No. 1, *supra*.

Notwithstanding (and without waiving) these objections, the Staff states as follows: The Staff has determined that the design of the cask storage pads (partially or fully loaded with storage casks) proposed by PFS satisfies the requirements of 10 C.F.R. § 72.122(b), given the design of the storage pad to withstand the 2,000-year return-period earthquake for the facility. The basis for the Staff's finding is provided, *inter alia*, in the following sections of SER Supplement No. 2: Section 2.1.6.4 ("Stability of Subsurface Materials"); Section 4.1.3.2 ("Structural," specifically revised Table 4-6 and the revised paragraph entitled "Seismicity"); Sections 5.1.3.1 and 4

("Description of Reinforced Concrete Structures" and "Structural Analysis for Reinforced Concrete Structures," specifically the discussion under the subsections entitled "Cask Storage Pads"); and Section 15.1.2.6 ("Earthquake," specifically the discussion of accident analyses).

INTERROGATORY NO. 3: To the extent that the Staff admits Request for Admission No. 1, in whole or in part, explain in each and every respect the basis upon which the Staff finds acceptable the survivability and durability of cement-treated soil for the redesigned CTB and storage pad foundation systems [sic]. See e.g., id.

STAFF RESPONSE. See Response to Request for Admission No. 1, *supra*, and the objections stated therein, which are incorporated by reference in response to this interrogatory. The Staff also objects to this request on the grounds that it (1) constitutes an improper compound question; (2) is overly broad and unduly burdensome insofar as it refers to the "survivability and durability of cement-treated soil" for both the redesigned CTB and storage pad foundation systems; and (3) is overly broad and unduly burdensome, insofar as the citation provided in this interrogatory, in fact, constitutes a reference to multiple pages of the State's proposed Contention Utah QQ and extensive materials filed in support thereof -- such that the State is effectively requesting that the Staff address, in a single interrogatory answer, multiple areas of concern raised by the State in support of its May 16, 2001 proposed late-filed Contention Utah QQ. See Response to Interrogatory No. 1, *supra*.

Notwithstanding (and without waiving) these objections, the Staff states as follows: With respect to PFS's proposed use of soil cement, the staff finds acceptable the "survivability and durability" of such soil cement based on the commitment made by PFS in the SAR (Rev. 22, at 2.6-117 to 118), to follow the standards, procedures, and recommendations contained in the "State-of-the-Art Report on Soil Cement," developed by ACI Committee 230. See ACI 230-1R-90 (Reapproved 1997). This report describes the state-of-the-art procedures and identifies the applicable standards for mix proportioning, construction, quality-control, and testing of soil cement. For example, the report lists ASTM D 559-82 ("Standard Methods for Wetting-and-Drying Tests of

Compacted Soil-Cement Mixtures”) and ASTM D 560-82 (“Standard Methods for Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures”), which specify test procedures for evaluating the “survivability and durability” of soil cement. The Staff concludes that adherence by PFS to these and the other standards contained in the ACI report will provide reasonable assurance with respect to the “survivability and durability” of soil cement intended for use at the proposed PFS ISFSI facility.

INTERROGATORY NO. 4: Describe with specificity the basis upon which the Staff finds acceptable PFS’s use of CPT data to determine whether there is potential variability of shear strength in the pad emplacement area. See Staff Response to Utah’s 18th Set, Request for Admission No. 6.

STAFF RESPONSE. PFS performed cone penetration tests at 37 locations in the storage-pad area and two locations in the CTB area. See SAR, Figures 2.6-18 and 2.6-19. The test results are presented in the SAR [Figures 2.6-5 (14 sheets) and 2.6-21 through 2.6-23] as plots of cone-tip resistance versus depth at points along six east-west lines, six north-south lines, and two diagonal lines. The plots illustrate the variability of soil shear strength and compressibility within the top 25–30 feet soil layer at the ISFSI site. The information provided via these plots, along with other information reviewed by the Staff in its evaluation of the site geotechnical information (see SER Supplement No. 2, Section 2.1.6.4., specifically the subsection entitled “Geotechnical Site Characterization”) is adequate to support engineering analyses of the facility structures, systems, and components important to safety.

INTERROGATORY NO. 5: Describe with specificity the basis upon which the Staff finds acceptable PFS’s demonstration of the stress-strain behavior of the native foundation soils under the range of cyclic strains imposed by the design basis earthquake. See id. Response to Request for Admission No. 7.

STAFF RESPONSE. The Staff finds that PFS has provided adequate information regarding the behavior of the native foundation soils to support the engineering analyses of the facility

structures, systems, and components important to safety. The soil properties were determined by PFS using the PFS site-specific tests. The specific properties determined were: (1) undrained shear strength based on laboratory triaxial testing; (2) the variation of the shear strength based on the cone penetration test data; (3) elastic material properties (including Young's Modulus, Poisson's Ratio, and Shear Modulus) determined using shear and compressional wave velocities from field seismic reflection, refraction, and cross-hole velocity measurements and cone penetrometer testing; and (4) Shear Modulus and Damping versus cyclic strain relationships that were derived from a combination of laboratory data developed by PFS and information available in the literature.

PFS has also performed sensitivity analyses to define the effects of the variability of the Shear Modulus and Damping versus cyclic strain relationships on the calculated seismic site-response factors. See Appendix F of Geomatrix Consultants, Inc., 2001a, *Fault evaluation study and seismic hazard assessment study—final report*. Revision 1. Oakland, CA: Geomatrix Consultants, Inc. (cited in Section 2.3 of SER Supplement No. 2). The Staff notes that the modulus-reduction and damping versus strain curves provided by PFS were generated using accepted engineering practices and are consistent with other curves generated from comparable data.

Based on the foregoing information and the Staff's review as documented in Section 2.1.6 of SER Supplement No. 2, the Staff finds acceptable the Applicant's stress-strain parameters of the native foundation soils under the range of cyclic strains imposed by the design basis earthquake.

INTERROGATORY NO. 6: Describe with specificity the basis upon which the Staff finds acceptable the use of one set of time history in Holtec's non-linear analysis, HI-202540. See id. Response to Request for Admission No. 12.

STAFF RESPONSE. As documented in HI-202540, the non-linear analysis of the response of multiple casks on the rigid storage pad is based on use of a single set of three time

histories. These time histories, in turn, are based on the strong motion recording of the November 23, 1980, M 6.9 Irpinia, Italy, earthquake, and have been properly scaled to meet site-specific requirements. Further, as indicated in Stone & Webster G(PO18)-3 (“Development of Time Histories for 2000-Year Return Period Design Spectra”), these time histories satisfy the criteria contained in Section 3.7.1 (“Seismic Design Parameters”) of NUREG-0800 and Section 5 of the NUREG-1567.

The Staff’s review of the Applicant’s structural and cask stability analyses is contained in the following sections of SER Supplement No. 2: Section 5.1.3.4 (“Structural Analysis for Reinforced Concrete Structures”); Section 5.1.4.4 (“Structural Analysis of Other Structures, Systems, and Components Important to Safety, specifically the subsection entitled “Storage Cask”); and Section 15.1.2.6 (“Earthquake”).

INTERROGATORY NO. 7: Describe the appropriate safety margins the Staff finds acceptable for the factors of safety against overturning and sliding of the storage pads and the basis thereof. See NUREG-0800, Section 3.8.5 at 3.8.5-3 to 4 (Rev. 1 - July 1981).

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, ambiguous, confusing and misleading insofar as (i) the request uses the phrases “appropriate safety margins” and “factors of safety against overturning and sliding of the storage pads” and (ii) NUREG-0800 does not apply, in terms, to the stability of cask storage pads, and (iii) it appears to refer to “overturning” of the storage pads; (2) constitutes an improper compound question insofar as it refers to “factors of safety against overturning and sliding of the storage pads,” whereas the State fails to indicate the factor of safety applicable to the sliding of a storage pad, and (3) the State has not demonstrated that the information requested could not have been obtained from other sources, including, without limitation, the document cited in this interrogatory (*i.e.*, NUREG-0800).

Notwithstanding these objections, the Staff states as follows: As reflected in Section 2.1.6.4 of SER Supplement No. 2, the Staff finds acceptable the Applicant's evaluation pertaining to bearing capacity safety margins. Moreover, as discussed in the SER Supplement No. 2 (at 44–45), the Staff's acceptance of the Applicant's safety evaluation with respect to potential sliding of the storage pads is based on the Applicant's position that sliding of the pads would not constitute a safety hazard. Calculations presented by PFS (cited in SER Supplement No. 2, at 45) demonstrate that under seismic loading conditions, sliding of the pads would tend to increase the stability of the casks, and that the casks would continue to perform their safety functions. Furthermore, there are no safety-related external connections to the pads or casks that may rupture or be misaligned as a result of pad sliding. These and other considerations, which are documented in Section 2.1.6.4 of SER Supplement No. 2, led the Staff to conclude that the proposed pad design satisfies the regulatory requirements of 10 C.F.R. § 72.122(b).

INTERROGATORY NO. 8: Describe with specificity the technical basis upon which the Staff finds that the design of the pad foundation system meets the structural acceptance criteria in NUREG-0800, Section 3.8.5.

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous insofar as it is unclear as to which "structural acceptance criteria" the State is referring; (2) is overly broad and unduly burdensome; and (3) constitutes an impermissible compound question insofar as it asserts that NUREG-0800 establishes criteria for concrete storage pads. Notwithstanding these objections, the Staff states as follows: The structural acceptance criteria in Section 3.8.5 of NUREG-0800 pertain to structural stability (see Staff Response to Interrogatory No. 7, *supra*) and strength. The Applicant's analysis of the strength of the storage pad is given in G(PO17)-2. This analysis satisfies the requirements of ACI-349, in that it demonstrates that the capacity of the storage pad exceeds the demand that would be imposed on the storage pad. The basis for the Staff's finding is provided in the following sections of SER

Supplement No. 2: Section 2.1.6.4 (“Stability of Subsurface Materials”); Section 4.1.3.2 (“Structural,” specifically revised Table 4-6 and the revised paragraph entitled “Seismicity”); Sections 5.1.3.1 and 4 (“Description of Reinforced Concrete Structures” and “Structural Analysis for Reinforced Concrete Structures,” specifically the discussion under the subsections entitled “Cask Storage Pads”); and Section 15.1.2.6 (“Earthquake,” specifically the discussion of accident analyses).

INTERROGATORY NO. 9: Describe with specificity the basis upon which the Staff finds acceptable PFS’s response contained in Commitment Resolution Letter # 38 to the NRC’s questions and comments regarding the stability analysis performed by PFS for the cask storage pads. See Letter from John Donnell, PFS to NRC dated February 7, 2002.

STAFF RESPONSE. The Staff’s acceptance of the proposed pad design (with respect to sliding safety) is based primarily on its evaluation of PFS calculations and analyses cited in Chapter 2 of SER Supplement No. 2, at 44–45. See, e.g., Stone and Webster Engineering Corporation, 2001b. *Stability Analyses of Storage Pads*. PFSF Calculation No. 05996.02GB-04. Revision 9. Denver, CO: Stone and Webster Engineering Corporation. The Staff asked the Applicant to include in the SAR a discussion briefly summarizing a specific portion (pages 36-45) of Stone and Webster Calculation No. 05996.02GB-04, Revision 9. The letter cited in this interrogatory contains a commitment by PFS to update the SAR accordingly, and includes the proposed language for the next SAR update. The Staff considers the requested revision to be an administrative change incorporating material previously provided by PFS, and is not a new or revised analysis.

INTERROGATORY NO. 10: Describe with specificity the basis upon which the Staff finds acceptable Holtec Report, *Multi Cask Response at the PFS ISFSI from 2000 Year Seismic Event*, HI-2012640, given that in HI-2012640 Holtec assumes that the storage pad will act as a rigid mat and that assumption of pad rigidity is contradicted by Calculation No. 05996.02 G(P017)-2, *Storage Pad Analysis and Design* by International Civil Engineering Consultants.

STAFF RESPONSE. The Staff objects to this request on the grounds that it (1) is vague, confusing and ambiguous in its use of the phrase “contradicted by;” and (2) constitutes an improper compound question. Notwithstanding these objections, the Staff states as follows: The Staff does not see a “contradiction” between the analysis performed in HI-2012640 and Calculation No. 05996.02 G(P017)-2. The HI-2012640 analysis follows the guidelines identified in ASCE 4-98, Section 3.1.8. The dynamic analysis performed in HI-2012640 conservatively assumes a rigid pad that will result in bounding loads produced by the casks, since deformation of the slab does not absorb any energy. These bounding loads are then applied to the storage pads, in the analysis described in G(PO17)-2, to identify the amount and placement of reinforcing required such that the capacity of the storage pads exceeds the demand that would be imposed on the storage pad.

3. Document Requests

DOCUMENT REQUEST NO. 1. All documents identified, used or referred to in responding to the above requests for admission and interrogatories.

STAFF RESPONSE. See Response to General Document Request No. 1, *supra*, and the objections stated therein, which are incorporated by reference in response to this document request. In addition, the Staff objects to this request on the ground that it is repetitious and burdensome, insofar as part (b) of General Document Request No. 1 also requests documents “identified, referred to, relied on, or used in any way in . . . (b) responding to the following interrogatories and requests for admissions in this document.” Notwithstanding (and without waiving) these objections, documents will be produced to the extent that such documents (a) are not objected to, (b) are not otherwise available from other sources, and (c) are not draft, predecisional and/or privileged documents that are exempt from disclosure under 10 C.F.R. § 2.790, in which case they will be identified in a privilege log.

DOCUMENT REQUEST NO. 2. All calculations, analyses, or other documents prepared by or for the Staff relating to testimony or evidence that the Staff may rely upon or otherwise use at the hearing on unified Contention Utah L/QQ.

STAFF RESPONSE. See General Objection 10 and Staff Response to General Document Request No. 2, *supra*. Notwithstanding (and without waiving) these objections, which are incorporated by reference in response to this document request, documents will be produced to the extent that such documents (a) are not objected to, (b) are not otherwise available from other sources, and (c) are not draft, predecisional and/or privileged documents that are exempt from disclosure under 10 C.F.R. § 2.790, in which case they will be identified in a privilege log.

DOCUMENT REQUEST NO. 3. Any soil-cement test data, relating to PFS's intended use of cement-treated soil at the ISFSI site, generated by the Staff, its representatives [sic], or provided to the Staff by PFS.

STAFF RESPONSE. See Response to Document Request No. 2.

DOCUMENT REQUEST NO. 4. Any soil-structure interaction analyses, relating to PFS's intended use of cement-treated soil under and around the storage pads, generated by the Staff, its representatives [sic], or provided to the Staff by PFS.

STAFF RESPONSE. See Response to Request for Admission No. 3, and Response to Document Request No. 2, *supra*.

DOCUMENT REQUEST NO. [5]. Any analyses of the long term behavior of cement-treated soil under operational loading and environmental factors generated by the Staff, its representatives [sic], or provided to the Staff by PFS.

STAFF RESPONSE. See Response to Request for Admission No. 5, and Response to Document Request No. 2, *supra*.

DOCUMENT REQUEST NO. [6]. Any CPT data from the PFS site that has been generated by the Staff, its representatives, or provided to the Staff by PFS.

STAFF RESPONSE. Documents, if any, will be produced to the extent that such documents (a) are not objected to, (b) are not otherwise available from other sources, and (c) are not draft, predecisional and/or privileged documents that are exempt from disclosure under 10 C.F.R. § 2.790, in which case they will be identified in a privilege log.

Respectfully submitted,

/RA/

Martin J. O'Neill
Counsel for NRC Staff

Dated at Rockville, Maryland
this 27th day of February 2002

February 27, 2002

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
PRIVATE FUEL STORAGE, L.L.C.)	Docket No. 72-22-ISFSI
)	
(Independent Spent Fuel)	
Storage Installation))	

JOINT AFFIDAVIT OF GOODLUCK I. OFOEGBU
AND DANIEL J. POMERENING

_____)	
COUNTY OF BEXAR)	
)	SS:
STATE OF TEXAS)	
_____)	

Goodluck I. Ofoegbu ("GIO") and Daniel J. Pomerening ("DJP"), having first been duly sworn, do hereby state as follows:

1(a). (GIO) I am employed as a Senior Research Engineer at the Center for Nuclear Waste Regulatory Analysis ("CNWRA"), which is division of the Southwest Research Institute ("SwRI"), in San Antonio, Texas. I am providing this affidavit under a technical assistance contract between the NRC Staff ("Staff") and SwRI. A statement of my professional qualifications is attached to the NRC Staff's response to the State of Utah's eighteenth set of discovery requests, filed on February 1, 2002.

1(b). (DJP) I am employed as a Principal Engineer at the Mechanical and Materials Engineering Division of the Southwest Research Institute ("SwRI"), in San Antonio, Texas. I am providing this affidavit under a technical assistance contract between the NRC Staff ("Staff") and

SwRI. A statement of my professional qualifications is attached to the NRC Staff's response to the State of Utah's eighteenth set of discovery requests, filed on February 1, 2002.

2(a). (GIO) As part of my official responsibilities, I reviewed the adequacy of the investigations of site and subsurface conditions pertaining to subsurface soils, soil stability and foundation loading issues performed by or on behalf of Private Fuel Storage L.L.C. ("PFS" or "Applicant"), as described in the Applicant's Safety Analysis Report ("SAR"). I further assisted in preparing the Staff's related safety evaluation of these matters, presented in the NRC Staff's "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER"), issued on September 29, 2000, as revised in SER Supplement No. 2, dated December 21, 2001.

2(b). (DJP) As part of my official responsibilities, I reviewed the adequacy of the Applicant's facility design, based upon a design earthquake derived from the Applicant's PSHA with a 2,000 year return period. I further assisted in preparing the Staff's related safety evaluation of these matters, presented in the NRC Staff's "Safety Evaluation Report Concerning the Private Fuel Storage Facility" ("SER"), issued on September 29, 2000, as revised in SER Supplement No. 2, dated December 21, 2001.

3(a). (GIO) I have reviewed the foregoing answers of the NRC Staff to Requests for Admission Nos. 1-6, and Interrogatories Nos. 1-5 and 7-9, in the "State of Utah's Twentieth Set of Discovery Requests Directed to the NRC Staff," and verify that they are true and correct to the best of my knowledge, information and belief.

3(b). (DJP) I have reviewed the foregoing answers of the NRC Staff to Requests for Admission Nos. 1-4, and Interrogatories 1, 6, 8, and 10, in the "State of Utah's Twentieth Set of Discovery Requests Directed to the NRC Staff," and verify that they are true and correct to the best of my knowledge, information and belief.

4. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

/RA/

Goodluck I. Ofoegbu

Sworn to before me this
27th day of February, 2002

Ruben Juarez

Notary Public

11/29/05

My commission expires: _____

4. I hereby certify that the foregoing is true and correct to the best of my knowledge, information and belief.

/RA/

Daniel J. Pomerening

Sworn to before me this
27th day of February, 2002

Ruben Juarez

Notary Public

My commission expires: 11/29/05

GOODLUCK I. OFOEGBU
Senior Research Engineer
Center for Nuclear Waste Regulatory Analyses
Southwest Research Institute
San Antonio, Texas

Education:

B.Sc., Geology, University of Nigeria, Nsukka, 1977

M.A.Sc., Geological Engineering, University of Toronto, Canada, 1981

Ph.D., Geological Engineering, University of Toronto, Canada, 1985

Qualifications:

Dr. Ofoegbu is a geological engineer specializing in the mechanical analyses of geological processes, finite element modeling, and the constitutive modeling of geological materials. He has a background in geoscience, geomechanics and computer software development; and about 20 years of experience in teaching, research, and consulting.

As a senior research engineer at the Southwest Research Institute, Dr. Ofoegbu has led several numerical modeling projects to investigate technical issues related to possible licensing of a geologic repository for high level nuclear waste at Yucca Mountain, such as: Evaluation of a finite element code, ABAQUS, for modeling thermal-mechanical-hydrological coupled processes; and investigations of ground motion patterns resulting from numerically simulated normal fault earthquakes, effects of perched water on thermally driven moisture flow, effects of spatial and time-dependent rock-mass property variations on the stability of underground openings and groundwater flow, and effects of regional crustal density variations on patterns of small-volume basaltic volcanism. Other numerical modeling investigations led by Dr. Ofoegbu include finite element analyses of geologic finite strain for fracture distribution predictions and numerical simulation of a deforming salt body. He has also participated in the development of review procedures for an anticipated license application for the proposed Yucca Mountain repository, technical review of uranium recovery site reclamation plans under the Uranium Mill Tailings Radiation Control Act, and a safety evaluation report for an Independent Spent Fuel Storage Installation.

Dr. Ofoegbu was a research engineer at the University of Toronto for five years, during which time he was the Principal Investigator for an industrial contract on the development and numerical implementation of a constitutive model for geological materials. He developed constitutive models for intact rock, non-lithified soils, and regularly jointed rock mass; implemented the models as user-defined code modules in ABAQUS (a commercially available finite element code); and conducted finite element modeling of the Atomic Energy of Canada Limited's mine-by experiment tunnel.

As an Assistant Professor at the Ahmadu Bello University, Nigeria, in the Department of Civil Engineering, Dr. Ofoegbu taught courses and supervised student research projects in the areas of soil mechanics, earthwork, and foundation engineering, and served as Principal Consultant on industrial site-investigation contracts.

Dr. Ofoegbu has published 25 articles in refereed journals and conference proceedings, as well as several technical reports. He is a member of the International Society for Rock Mechanics and the American Rock Mechanics Association. He is a registered professional engineer in Canada.

Professional Chronology:

Senior Research Engineer, Southwest Research Institute, 1993–Present; Consulting Engineer, GI-Johnson Engineering, 1991–93; Research Engineer, University of Toronto, 1987–92; Assistant Professor, Ahmadu-Bello University, 1985–87; Teaching/Research Assistant, University of Toronto, 1980–85; Hydrogeologist, Lower Benue Development Authority, 1978–79; Mathematics/Physics Teacher, Ogun State of Nigeria, 1977–78.

Publications:

Ofoegbu, G.I., S. Painter, R. Chen, R.W. Fedors, and D.A. Ferrill. 2001. Geomechanical and thermal effects on moisture flow at the proposed Yucca Mountain nuclear waste repository. *Nuclear Technology*, 134: 241–262.

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Connor, C.B., J.A. Stamatakos, D.A. Ferrill, B.E. Hill, G.I. Ofoegbu, and F.M. Conway. 2000. Volcanic hazards at the proposed Yucca Mountain, Nevada, high-level radioactive waste repository I: Geologic factors controlling patterns of small-volume basaltic volcanism. *Journal of Geophysical Research* 105(1): 417–432.

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Ofoegbu, G.I., and D.A. Ferrill. 1998. Mechanical analyses of listric normal faulting with emphasis on seismicity assessment. *Tectonophysics* 284: 65–77.

Curran, J.H., and G.I. Ofoegbu. 1993. Modeling discontinuities in numerical analysis. In J.A. Hudson (ed.). *Comprehensive Rock Engineering* (Chapter 18). Pergamon Press, New York, 1:443–468.

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Kenney, T.C., D. Lau, and G.I. Ofoegbu. 1984. Permeability of compacted granular materials. *Canadian Geotechnical Journal* 21(4): 726–729.

DANIEL J. POMERENING
Principal Engineer
Mechanical and Materials Engineering Division
Southwest Research Institute
San Antonio, Texas

Education:

B.S. in Aerospace Engineering, Georgia Institute of Technology, 1975
M.E. in Civil Engineering, Structural Engineering and Structural Mechanics,
University of California, Berkeley, 1977

Qualifications:

Mr. Pomerening is experienced in design, analysis, and testing of structural systems in the fields of Naval Architecture, Aerospace and Civil Engineering. While working for the Naval Ship Research and Development Center, Mr. Pomerening participated in the design, construction, instrumentation, testing, and data reduction of a variety of models tested in wind tunnels. As a research assistant at the University of California, Berkeley, Mr. Pomerening was involved with the testing of building structures on a large scale seismic simulator. His Master's project produced a feasibility study on a boundary layer wind tunnel to study the dynamic effects of the wind on structures immersed in the atmospheric boundary layer.

Since joining Southwest Research Institute, Mr. Pomerening has been involved in the study of structural response of systems under dynamic loading with specific emphasis on transient and shock loading. Investigations of the structural integrity under seismic motion have included the response of floating platforms, industrial plants, electrical racks, valves and other components. Mr. Pomerening has performed seismic qualification programs for components using both analytical and experimental procedures. Work in this area has also included a Nuclear Regulatory Commission (NRC) program designed to evaluate methodology of equipment seismic qualification for nuclear plants. This has included development of procedures for use of hand held analyzers for determination of the in-situ modes of systems. Mr. Pomerening has supported programs in the Center for Nuclear Waste Regulatory Analysis (CNWRA). These have included reviews of safety analysis reports with specific emphasis on identification of design criteria and assessment of the structural integrity of structures, systems and components to with respect to the NRC Standard Review Plans.

Studies of aerospace structures have included structural models of light aircraft for determination of structural-borne noise, the T-37B aircraft wing to determine local crack growth rates, and the dynamic response of a number of missile systems during transportation and flight. Mr. Pomerening has performed several preliminary hazards analysis of electrical systems and reliability studies of space station mechanical systems. Other activities have included ground vibration and flight flutter testing as part of the T-37B structural life extension program, and slosh and crash testing of light aircraft wings. His work in Naval Architecture has been associated with LNG transport ships, the use of reinforced concrete in the marine environment, the study of ship-based missile systems, blast response of submarines and radomes and dynamic response and fatigue assessments of submersibles.

Under Mr. Pomerening's management, a number of programs have been performed to qualify equipment installed on air, sea, and land-based vehicles. The programs have included test

tailoring in accordance with the most recent standards. Mr. Pomerening has also managed a number of programs which tested packaging systems used in the shipment of nuclear materials for compliance with 10 CFR, Part 72 requirements.

Professional Chronology:

Student Engineering Trainee, Naval Ship Research and Development Center, 1970-75; Research Assistant, University of California, Berkeley, 1976-77; Southwest Research Institute, 1977 to Present in the positions of Research Engineer, 1977-83, Senior Research Engineer, Department of Mechanical and Fluids Engineering, 1983-96; and Principal Engineer, 1999 to Present.

Memberships:

American Society of Civil Engineering
ASTM
American Concrete Institute

DANIEL J. POMERENING
Publications

- Kana, D.D., D.J. Pomerening, and J.C. Simonis, "Recent Research on Methodology for Seismic Qualification of Nuclear Plant Equipment," Nuclear Engineering and Design, Vol. 79, pp. 229-241, 1984.
- Kana, D.D., and D.J. Pomerening, "Suitability of Synthesized Waveforms for Seismic Qualification of Equipment," Journal of Pressure Vessel Technology, Vol. 106, pp. 63-68, February 1984.
- Kana, D.D., and D.J. Pomerening, "Recent Development in Methodology for Dynamic Qualification of Nuclear Plant Equipment," ASME Pressure Vessels and Piping Technology Conference, Paper No. 84-PVP-58, San Antonio, Texas, June 1984.
- Kana, D.D., and D.J. Pomerening, "Evaluation of Waveforms for Seismic Qualification of Line Mounted Equipment," Proceedings of the ASME Pressure Vessels and Piping Technology Conference, Vol. 98-6, pp. 123-131, New Orleans, Louisiana, June 1985.
- Kana, D.D., and D.J. Pomerening, "Dynamic Fragility Concepts for Equipment Design and Qualification," Nuclear Engineering and Design, Vol. 94, pp. 41-52, 1986.
- Unruh, J.F., D.J. Pomerening, and D.C. Scheidt, "Evaluation of Shock Response in Combat Vehicles: Scale Model Results," Shock and Vibration Bulletin, Vol. 56, Part 1, pp.151-160, August 1986.
- Kana, D.D., and D.J. Pomerening, "A Method for Correlating Severity of Different Seismic Qualification Tests," Journal of Pressure Vessel Technology, Vol. 109, pp. 58-64, February 1987.
- Kana, D.D., and D. J. Pomerening, "Determination of Waveform Similarity from Seismic Response Spectra," Proceedings of 10th Structural Mechanics in Reactor Technology Conference, Anaheim, California, Paper K-0963, August 1989.
- Pomerening, D.J., "Test Facilities for Radioactive Material Transport Packages," Southwest Research Institute™, USA, RAMTrans, Vol. 2 Nos. 4/5, Nuclear Technology Publishing, pp. 91-94, 1991.
- Kana, D.D., D.J. Pomerening, and P.Y. Chen, "Compatible Relationships Between Time History and Direct Methods for Generating Elevated Response Spectra," ASME PVP, Vol. 256-1, pp. 121-134, July 1993.
- Pomerening, D.J., M.B. Treuhaft, and J.J. Polonis, "Will it Survive as Well as Perform? Component Qualification Testing," Proceedings International Filtration Conference, pp.117-127, July 7, 1996.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
PRIVATE FUEL STORAGE L.L.C.) Docket No. 72-22-ISFSI
)
(Independent Spent)
Fuel Storage Installation))

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S OBJECTIONS AND RESPONSES TO THE 'STATE OF UTAH'S TWENTIETH SET OF DISCOVERY REQUESTS DIRECTED TO THE NRC STAFF,'" in the above captioned proceeding have been served on the following through deposit in the NRC's internal mail system, with copies by electronic mail, as indicated by an asterisk, or by deposit in the U.S. Postal Service, as indicated by double asterisk, with copies by electronic mail this 27th day of February, 2002:

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/RA/

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