

RAS 3454

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	Docket No. 72-22-ISFSI
PRIVATE FUEL STORAGE, LLC)	ASLBP No. 97-732-02-ISFSI
(Independent Spent Fuel)	
Storage Installation))	September 28, 2001

STATE OF UTAH'S OBJECTIONS AND RESPONSE TO
APPLICANT'S SEVENTH SET OF FORMAL DISCOVERY REQUESTS
TO INTERVENOR STATE OF UTAH

The State responds to Applicant's September 18, 2001 Seventh Set of Discovery Requests ("Applicant's 7th Set"), which relate to Contention Utah L, Part B. The State and the Applicant have agreed that the party responding to Requests for Admissions and Interrogatories, may have eight working days in which to timely file a response.

GENERAL OBJECTIONS

These objections apply to the State of Utah's responses to all of the Applicant's Seventh Set of Discovery Requests.

1. The State of Utah objects to the Applicant's instructions and definitions on the grounds and to the extent that they request or purport to impose upon the State any obligation to respond in manner or scope beyond the requirements set forth in 10 CFR §§ 2.740, 2.741 and 2.742.

2. The State of Utah objects to Applicant's Request for Production of Documents to the extent that it requests discovery of information or documents protected under the attorney-client privilege, the attorney work-product doctrine and limitations on

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discovery of trial preparation materials and experts' knowledge or opinions set forth in 10 CFR § 2.740 or other protection provided by law. The State has provided PFS with a Privilege Log which identifies all documents subject to these privileges and protections and which the State reserves the right to supplement.

I. GENERAL DISCOVERY RESPONSES

A. 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.

RESPONSE TO GENERAL INTERROGATORY NO. 1: The following persons were consulted and/or supplied information in responding to the discovery requests for Applicant's Fourth Set of Requests. Their Declarations are attached hereto as Exhibit 1.

General Discovery Requests

Denise Chancellor, Esq.
Assistant Attorney General, Utah Attorney General's Office
160 East 300 South, 5th Floor, Salt Lake City, Utah 84114-0873

Utah Contentions I, Part B Discovery Requests

Walter Arabasz, Ph.D.
Research Professor of Geology and Geophysics, University of Utah
Director, University of Utah Seismograph Stations
134 S. 1460 E., Room 705, Salt Lake City, Utah 84112-0110
Limited to Requests for Admissions No. 1 & 2; Interrogatories 1-4(a) and 5-8 and document requests relating thereto.

Steven F. Bartlett, Ph.D.
Assistant Professor, University of Utah, Civil Engineering Department
EMRO 113, 160 South Central Campus Drive, Salt Lake City, Utah 84112-0110
Limited to Interrogatory No. 4(b) and document requests relating thereto.

Marvin Resnikoff, Ph.D.
Senior Associate, Radioactive Waste Management Associates
526 West 26th Street, Room 517, New York, NY 10001
Limited to Interrogatory No. 4(c) and document requests relating thereto.

In response to whether the information or opinions of anyone who was consulted in connection with the State's response to an interrogatory or request for admission differs from the State's written answer to the discovery request, the State is unaware of any such difference among those who may have been consulted

GENERAL INTERROGATORY NO. 2. To the extent that the State has not previously produced documents relevant to any Utah admitted contention, including without limitation Part B of Contention Utah L (Geotechnical), as that contention was amended by the Board in its Memorandum and Order (Requesting Joint Scheduling Report and Delineating Contention Utah L) dated June 15, 2001 ("Memorandum and Order") (hereinafter "Part B of Utah L"), identify all such documents not previously produced. The State may respond to this request by notifying PFS that relevant documents are available for its review and/or copying.

RESPONSE TO GENERAL INTERROGATORY NO. 2 To the extent that any documents are relevant to this request, they will be available for review and copying at the Office of the Attorney General.

GENERAL INTERROGATORY NO. 3. For each admitted Utah contention, including without limitation Part B of Utah L, give the name, address, profession, employer, area of professional expertise, and educational and scientific experience of each person whom the State 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.

RESPONSE TO GENERAL INTERROGATORY NO. 3: The State identifies the following persons it expects to call as witnesses at the hearing on Utah L, Part B and their

area of testimony:

Walter Arabasz, Ph.D (seismic hazard analysis)

Steven F. Bartlett, Ph.D (adequacy of PFS's design)

Marvin Resnikoff, Ph.D (radiation dose limits)

The State has already provided the Applicant with copies of resumes and declarations of all three witnesses, either directly or as part of filings in this proceeding, including reference to those documents the witnesses have reviewed or relied upon. The State is in the process of determining whether any of those resumes or declarations need to be updated and will advise PFS if and when revisions thereto are available.

GENERAL INTERROGATORY NO. 4. For each admitted Utah contention, including without limitation Part B of Utah L, identify the qualifications of each expert witness whom the State 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.

RESPONSE TO GENERAL INTERROGATORY NO. 4: See Response to

General Interrogatory No. 3.

GENERAL INTERROGATORY NO. 5. For each admitted Utah Contention, including without limitation Part B of Utah L, 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.

RESPONSE TO GENERAL INTERROGATORY NO. 5: See Response to

General Interrogatory No. 3

B. General Document Requests

GENERAL 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 Applicant's previous sets of Formal Discovery Requests to Intervenor State of Utah, (b) responding to the following interrogatories and requests for admissions in this document, or (c) responding to the any subsequent interrogatories and requests for admissions filed with respect to the State's Contentions as admitted by the Board.

RESPONSE TO GENERAL REQUEST NO. 1 - UTAH L, PART B: *Sæ* specific discovery responses, below.

II. DISCOVERY RESPONSE - UTAH L, PART B

A. Objection

The State objects to the instructions contained in the Applicant's 7th Set of Discovery to the State under the caption "Requests Directed at Part B of Contention Utah L" at p. 5.¹ PFS has not specifically identified "subsequent communications between the Applicant and the [Staff]," nor has PFS divulged whether such communications were written or verbal. Applicant's 7th Set at 5. Moreover, the SER is the Staff's analysis of PFS's seismic exemption request and does not provide justification for PFS's request to the Staff.

¹PFS's instructions at p. 5 state:

The responses should take into account (i) the information contained in the License Application, as submitted and amended, (ii) the information contained in PFS's April 9, 1999 request for an exemption from the requirements of 10 CFR § 72.102(f) to allow PFS to use a probabilistic seismic hazard analysis ("PSHA") instead of a deterministic analysis ("the Exemption Request"), subsequent communications between Applicant and the NRC Staff ("Staff") regarding the Exemption Request, the Staff's September 29, 2000 Safety Evaluation Report for the PFSF ("SER") as it relates to the Exemption Request, and (iii) filings and other information provided by Applicant and the Staff since the issuance of the SER with respect to issues concerning the Exemption Request.

In addition, PFS has not specifically identified “filings and other information provided by Applicant and the Staff since the issuance of the SER.” *Id.* Again, Staff documents do not provide PFS’s justification for PFS’s request to be exempted from 10 CFR § 72.102(f). If PFS wants the State to take relevant information into account when it responds to PFS’s discovery, PFS should specifically identify the relevant documents.

B. Requests for Admissions - Utah L, Part B

ADMISSION REQUEST NO. 1: Do you admit that, in support of the Exemption Request, Applicant submitted to the Staff adequate justification supporting the grant of an exemption from the requirements of 10 CFR § 72.102(f) based on a probabilistic methodology with a 1,000 year return earthquake?

RESPONSE TO ADMISSION REQUEST NO. 1: The State objects to Request No. 1. PFS is not seeking an exemption from 10 CFR § 72.102(f) based on probabilistic methodology with a 1,000 year return earthquake. The Request is therefore not relevant to Contention Utah L, Part B.

ADMISSION REQUEST NO. 2: Do you admit that, in support of the Exemption Request, Applicant submitted to the Staff adequate justification supporting the grant of an exemption from the requirements of 10 CFR § 72.102(f) based on a probabilistic methodology with a 2,000 year return earthquake?

RESPONSE TO ADMISSION REQUEST NO. 2: Denied.

C. Interrogatories - Utah L, Part B

INTERROGATORY NO. 1: To the extent that the State denies Request for Admission No. 1, identify and fully explain each respect in which the State contends that the justification provided by PFS in its Exemption Request is inadequate to support the grant of an exemption from the requirements of 10 CFR § 72.102(f) based on a probabilistic methodology with a 1,000 year return earthquake, and the bases therefor.

ANSWER TO INTERROGATORY NO. 1: The State objects to Interrogatory No. 1. PFS is not seeking an exemption from 10 CFR § 72.102(f) based on a probabilistic

methodology with a 1,000 year return earthquake. The Request is therefore not relevant to Contention Utah L, Part B. With respect to whether PFS has justified its exemption request based on a probabilistic methodology with a 2,000 year return earthquake, see response to Interrogatory No. 2.

INTERROGATORY NO. 2: To the extent that the State denies Request for Admission No. 2, identify and fully explain each respect in which the State contends that the justification provided by PFS is inadequate to support the grant of an exemption from the requirements of 10 CFR § 72.102(f) based on a probabilistic methodology with a 2,000 year return earthquake, and the bases therefor.

ANSWER TO INTERROGATORY NO. 2: PFS has not justified why it cannot comply either with existing requirements of 10 CFR § 72.102(f) calling for design based on a deterministic seismic hazard analysis or, in the proposed use of a probabilistic seismic hazard analysis, with a 10,000 year return period that would be required by the Commission's Rulemaking Plan, SECY-98-126 to amend 10 CFR § 72.102(f). PFS has provided no explanation of whether there are any physical or financial constraints that preclude PFS from so complying or why its exemption to 10 CFR § 72.102(f) is in the public interest.

PFS's justification to use a probabilistic methodology (PSHA) with a 2,000 year return period and be exempt from 10 CFR § 72.102(f) appears to be based, first, on PFS's submittal to the NRC on April 2, 1999, in which PFS requested the use of a PSHA with a 1,000 year return period ("PFS's exemption request"); second, on PFS's response to NRC Comments that "PFS should consider using a design earthquake that is based on a Probabilistic Seismic Hazard Analysis (PSHA) with a return frequency of 2000 years" [or alternatively submit additional justification for using a 1000-year return period] (Commitment Resolution Letter # 14, August 6, 1999); and, third, on reasoning subsequently

documented by NRC Staff (e.g., the Staff's preliminary Safety Evaluation Report ("PSER"), December, 15, 1999, at 2-44, and the Staff's final Safety Evaluation Report ("FSER"), September 19, 2000, at 2-41).

The bases upon which the State argues there is inadequate justification to support the grant of an exemption from the requirements of 10 CFR § 72.102(f) and allow use of a probabilistic methodology with a 2,000 year return period have been appropriately summarized by the Board and affirmed by the Commission in its Memorandum and Order of June 14, 2001, at 4-6, therein identifying the State's genuine material disputes that are admissible for a hearing. In simplified restatement, these bases are as follows. First, PFS's exemption request fails to conform to the Commission's Rulemaking Plan, SECY-98-126 to amend 10 CFR § 72.102(f). Second, PFS has failed to show that its facility design will provide adequate protection against exceeding the section 72.104(a) dose limits. Third, the Staff's reliance on the reduced radiological hazard of stand-alone ISFSIs as compared to commercial power reactors to justify granting the exemption is based on incorrect factual and technical assumptions. Fourth, the Staff's reliance on DOE performance standards to support granting the exemption is not compelling because NRC has not formally adopted the same standards. Fifth, part of PFS's justification relies on the NRC's grant of an exemption to the INEEL ISFSI but an exemption does not prove the rule. Sixth, PFS's proposed design levels will be less stringent than those for new Utah building construction and highway bridges, and a 2,000-year return period for the PFS facility does not ensure an adequate level of conservatism. For each of these bases, the State has provided a detailed explanation in the State of Utah's Requests for Admission of Late-Filed Modification to

Basis 2 of Contention Utah L (November 9, 2000, and earlier January 26, 2000). Further detail is provided below in responses to Interrogatory Nos. 3-8.

INTERROGATORY NO. 3: To the extent that the State denies Request for Admission Nos. 1 and 2, identify and fully explain each respect in which the State contends that the Exemption Request should be based on a probabilistic methodology with an earthquake having a return period greater than 2,000 years, including without limitation, specification of the minimum earthquake return period which should be used to justify such an exemption request and the bases therefor.

ANSWER TO INTERROGATORY NO. 3: First, as described in detail in State of Utah's Request for Admission of Late-filed Modification to Basis 2 of Contention Utah L, dated January 26, 2000, at 7-9, the NRC Rulemaking Plan provides only two alternatives for design basis ground motions: a 1,000-year return period or a 10,000-year return period. The Staff has rejected the use of a 1,000-year return period. FSER at 2-41. Therefore, according to the Rulemaking Plan, the design basis ground motions should be calculated using a 10,000-year return period. The State contends that if PFS wishes to determine the design basis ground motions for its proposed facilities using a probabilistic methodology, then it should follow the Rulemaking Plan and use a return period of 10,000 years.

Additional support for the use of a 10,000-year return period comes from the precedent of establishing this return period, in accordance with NRC regulations, for the seismic design of the Waste Handling Building at the surface of the planned high-level nuclear waste repository at Yucca Mountain, Nevada. Yucca Mountain Science and Engineering Report, DOE/RW-0539, May 2001 ("DOE/RW-0539"), at 2-47. This building will house the systems to "receive, unload, handle, reload, package, and deliver high-level radioactive waste to subsurface waste handling systems." DOE/RW-0539 at 2-46. The

planned time period of operation for the Waste Handling Building at Yucca Mountain is approximately 24 years. See Draft Environmental Impact Statement for the Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, DOE/EIS-0250D, July 1999, at 2-13. This 24-year period is less than the planned 30- to 40-year operating period for the proposed PFS facility, which is relevant to considerations of adequate conservatism of design at the PFS facility. See Response to Interrogatory 8 below. If the NRC considers a 10,000-year return period to be appropriate for the seismic design of a temporary surface facility with an operational life of approximately 24 years at the Yucca Mountain nuclear waste repository, then it is not evident to the State why a shorter return period should be used for the seismic design of an ISFSI in Skull Valley with an operational life of about 30-40 years.

INTERROGATORY NO. 4: Identify and fully explain each respect in which the State contends that the Exemption Request would result in a design that fails to provide adequate protection against exceeding the 10 CFR § 72.104(a) dose limits, and the bases therefor including without limitation a full explanation of the circumstances under which the State contends that such dose limits will or may be exceeded, and how such circumstances relate to the Exemption Request.

ANSWER TO INTERROGATORY NO. 4

(a) Exceedance of 10 CFR § 72.104(a) dose limits is relevant to PFS's seismic exemption request because under the Rulemaking Plan, SECY 98-126, a 1,000 year return period may only be used in a PSHA if "the licensee's [or applicant's] analysis provides reasonable assurance that the failure of the SSC will not cause the facility to exceed the radiological requirements of 10 CFR 72.104(a)." Otherwise, under the Rulemaking Plan, the facility must be designed to withstand a 10,000 year return period earthquake.

(b) Even if the proposed 2,000 year return period event is approved as the design basis earthquake, the Applicant has failed to demonstrate that the design of the storage casks, storage pads, Canister Transfer Building ("CTB") and their foundation systems can safely withstand the newly revised probabilistic seismic hazard ground motions.

The newly revised ground motions have significantly increased over those previously proposed. However, in applying the newly revised ground motions, PFS has made several potentially unconservative assumptions regarding the redesign of the storage pads, CTB and their foundation systems. In an attempt to demonstrate adequate seismic stability for the revised ground motions, PFS is proposing extensive use of soil cement around the CTB mat foundation and the pad emplacement area. However, in its design calculations, analyses, evaluations, and testing, the Applicant has not correctly and adequately calculated the seismic loading, nor has the Applicant demonstrated that the soil cement and foundation systems can resist the proposed seismic loadings. These concerns have been raised and are discussed in Utah L and QQ. See Utah L, Basis 3, Utah Request for Admission of Contentions Utah QQ and requests to modify the bases thereof. In short, the design of the PFS facility fails to provide adequate protection against exceeding the 10 CFR § 72.104(a) dose limits in the following respects:

(1) The Applicant has not considered the range of applicable phasing of the foundation pad motion and the casks motion, the actual interface conditions between the casks and the pad on cement-treated soil, and the applicable wide range of phasing relationship in input time histories and types of earthquake waves striking the pads.

(2) The Applicant has not provided a realistic evaluation of the foundation pad

motion with cement-treated soil under and around the pads in relation to motion of the casks sliding on the pads. The actual load path under seismic loading has not been adequately addressed.

(3) The Applicant has used incorrect rigidity assumptions in the calculation of the dynamic forces acting upon the CTB mat and storage pad foundations. The assumption of rigidity leads to overestimation of the foundation damping and an underestimation of the seismic loads.

(4) The Applicant has failed to analyze the dynamic interaction of the soil-cement with the CTB mat foundation and the storage pad foundations. In the case of the CTB foundation, the effect of the large soil-cement mass around the building has been ignored. Also, the presence of a stiff, soil-cement perimeter around the CTB of about one building dimension impacts the soil impedance parameters and kinematic motion of the mat foundation.

(5) The Applicant has not substantiated the use of passive earth pressure to resist earthquake loadings. The passive earth pressure is an additional resisting force assumed to be present due to the use of soil-cement in the foundation design. PFS has not supported the use of passive earth pressure resulting from the soil-cement by the requisite engineering calculations and testing. Without the resisting passive earth pressure resisting force (*i.e.*, buttress effect), the Applicant can not demonstrate adequate resistance to dynamic sliding of the CTB and storage pads. However, the Applicant has failed to demonstrate that the proposed soil-cement buttress will not simply crack and be rendered ineffective during a seismic event. For the case of the CTB, the Applicant has not considered the deleterious

effects of separation and cracking of the soil-cement buttress caused by out-of-phase motion of the CTB mat foundation and the soil-cement buttress. For the case of the storage pads, the Applicant has not considered the deleterious effects of separation and cracking of the soil-cement caused by out-of-phase motion and pad-to-pad interaction forces resulting from closely spaced pads. For both the CTB and storage pad foundations, the Applicant has not calculated the bending and tensile stresses that will develop in the soil-cement and how these stresses will effect the ability of the soil-cement buttress to resist these forces without cracking or separation.

In summary, the overestimation of damping, underestimation of seismic loads, and failure to analyze the interaction of the foundations with the soil cement and its cracking are serious oversights which create unacceptable uncertainties in the estimation of the true seismic loadings and their potential impacts to the foundations and stability of the storage casks.

(c) The analysis performed by Holtec in the HI-STORM TSAR does not bound cask tip-over caused as a result of an earthquake at the PFS facility. The Holtec analysis relied on by PFS for its seismic exemption request evaluates only one cask being tipped over. The Holtec HI-STORM TSAR states: ""The tip-over accident could cause localized damage to the radial concrete shield and outer steel shell where the overpack impacts the surface. The overpack surface dose rate could increase due to the damage." TSAR at 11.2-7. Holtec's conclusion that the dose rate at the PFS site or the boundary will be small and localized does not hold for more than one cask tip-over. Moreover, no calculations were actually carried out by Holtec for the dose rate. In the event of an earthquake more than

one cask would be expected to tip over. Cask tip-over at the PFS facility could result in thinning of the metal skin and the concrete in the storage casks, which would cause an increase of gamma radiation. Absent an earthquake, the yearly dose rate at the fence post could be as high as 25 mrem per year. Thus, any additional dose increment, such as from thinning or cracking of the concrete would cause PFS to exceed the 25 mrem per year limit.

INTERROGATORY NO. 5: Identify and fully explain each respect in which the State contends that the reduced radiological hazard of stand-alone IFSFIs (*sic*) as compared to commercial power reactors is an inadequate basis to support the use by PFS of a probabilistic seismic hazards analysis with a 2,000 year return period earthquake, and the bases therefor, including without limitation a full explanation of the allegedly incorrect factual and technical assumptions about the PFSF's mean annual probability of exceeding a safe shutdown earthquake (SSE) and of the relationship between the median and mean probabilities of exceeding an SSE for commercial power reactors located in central and eastern United States and the median and mean probability of exceeding an SSE for the PFSF facility.

ANSWER TO INTERROGATORY NO. 5 The State objects to this interrogatory on the grounds that it contains at least four separate interrogatories. Without waiving this objection, the State's response to Interrogatory No. 5 is fully contained in State of Utah's Request for Admission of Late-filed Modification to Basis 2 of Contention Utah L dated November 9, 2000, at 8-10.

INTERROGATORY NO. 6: Identify and fully explain each respect in which the State contends that it is incorrect to rely on United States Department of Energy ("DOE") standard DOE-STD-1020-94 to support the use by PFS of a probabilistic seismic hazards analysis with a 2,000 year return period earthquake, and the bases therefor.

ANSWER TO INTERROGATORY NO. 6: The DOE standard DOE-STD-1020-94 has not been adopted by the NRC, so it does not provide an authorized basis for the exemption request. Further, the use of a return period of 2,000 years for design basis ground motion, as allowed in the DOE standard for "Performance Category 3," is at odds

with NRC's Rulemaking Plan, SECY-98-126, which requires either a 1,000-year return period for Frequency-Category-1 design basis events or a 10,000-year return period for Frequency-Category-2 design events. Rulemaking Plan at 4-5. Insofar as the proposition of using DOE-STD-1020-94 to support the use of a 2,000-year return period originated with the Staff and not PFS (see Response to Interrogatory No. 2), the *ad hoc* nature of this argument is emphasized by the fact that DOE-STD-1020-94 was fully available to the Staff when it drafted its Rulemaking Plan (indeed, the Staff partly relied on DOE Standard 1020 for its reasoning), yet it chose in its plan not to propose the use of a 2,000-year return period for ISFSIs. Until seismic analysis and design standards for ISFSIs are formally adopted by the NRC, reliance on DOE-STD-1020-94 to justify design of the PFS facility remains subject to legitimate dispute.

The Commission has noted that, "PFS is not bound by the rulemaking plan, but it does have the burden to show that the 2000-year design standard is sufficiently protective of public safety and property." CLI-01-12, June 14, 2001, at 16. In terms of the DOE standard DOE-STD-1020-94, the use of a return period of 2,000 years for the hazard annual probability of exceedance for designing Performance Category 3 structures, systems, and components is fundamentally coupled to a performance goal "set at an annual probability of exceedance of about 10^{-4} of damage beyond which hazardous material confinement and safety-related functions are impaired." DOE-STD-1020-94, at B-8. In the context of DOE-STD-1020-94, PFS has not demonstrated for its proposed ISFSI facility that use of a 2,000-year return period would achieve DOE's target performance goal, which requires consideration of such factors as the slope of the site-specific hazard curve over the annual

probability range of 10^{-3} to 10^{-5} , seismic fragility curves, and quantified uncertainties in the fragility curves. Id. at section C.

INTERROGATORY NO. 7: Identify and fully explain each respect in which the State contends that it is incorrect to rely on the exemption granted by the Staff to DOE for the Idaho National Engineering and Environmental Laboratory ("INEEL") ISFSI for Three Mile Island Unit 2 facility fuel to support the use by PFS of a probabilistic seismic hazards analysis with a 2,000 year return period earthquake, and the bases therefor.

ANSWER TO INTERROGATORY NO. 7: Because an exemption does not prove the rule, the exemption granted by the Staff to DOE for the INEEL ISFSI is not a compelling justification for PFS to use a probabilistic seismic hazard analysis ("PSHA") with a 2,000-year return period. The INEEL ISFSI exemption was not intended to establish, nor did establish, a 2,000-year return period as the reference probability for dry cask ISFSI design. On April 8, 1998, the NRC informed the DOE, "Since the rulemaking to revise the Part 72 seismic requirement for ISFSIs is unlikely to be completed before issuance of the TMI-2 ISFSI license, the staff intends to grant the exemption as requested if the Environmental Assessment (EA) is favorable." SECY-98-071, at 40127. Two months later in June 1998, the Rulemaking Plan was released with allowance only for reference probabilities of 1,000 years and 10,000 years, depending on risk.

In the case of the INEEL exemption, there were extenuating circumstances that led DOE to press for the exemption, namely existing design standards at INEEL for a higher risk facility at the ISFSI host site that required a peak design basis horizontal acceleration of 0.36 g, including effects of soil amplification, corresponding to the 84th percentile of deterministic seismic hazard analyses from the 1970s. Chen and Chowdhury, 1998, at 4-1. Ultimately, DOE was allowed to use a design earthquake with 0.36 g peak horizontal

acceleration (together with an appropriate response spectrum), which was higher than the probabilistic mean ground motion of 0.30 g for a 2,000-year return period. SECY-98-071 at 40126.

Another factor that significantly influenced the Staff's approval of the INEEL exemption was a site-specific radiological risk analysis for the INEEL ISFSI. Id. at 40126. Thus, issues of cask stability and radiological risk at the PFS site (*see* Response to Interrogatory No. 4) are directly germane to evaluating whether the INEEL exemption can legitimately be used to justify a 2,000-year return period for seismic design at the PFS site.

INTERROGATORY NO. 8: Identify and fully explain each respect in which the State contends that the use by PFS of a probabilistic seismic hazards analysis with a 2,000 year return period earthquake does not ensure an adequate level of conservatism, including without limitation the relevance and impact of the seismic design levels for new Utah building construction and highway bridges and of the use of a twenty-year initial licensing period for the PFSF rather than a thirty to forty year operating period, and the bases therefor.

ANSWER TO INTERROGATORY NO. 8: The State objects to this interrogatory as a compound question. Without waving this object, the issue of an adequate level of conservatism in the reference probability for PFS's seismic hazard analysis is implicit in Responses to Interrogatories Nos. 3, 5, 6, and 7. Here we address the relevance of seismic design levels for new Utah building construction, highway bridges, and the operating period of the PFS facility.

The proposition that design criteria for nuclear waste storage facilities such as the PFS facility should be more conservative than requirements found in model building codes is supported, for the sake of argument, by the DOE. According to DOE's design and evaluation philosophy for Natural Phenomena Hazards (NPH), "DOE-STD-1020 NPH

criteria for Performance Category 3 and higher SSCs are more conservative than requirements found in model building codes" DOE-STD-1020-94 at B-6. Under the same guidance, NRC fuel facilities are assigned a higher Performance Category than "essential facilities" governed by model building codes. *Id.* In model building codes, essential facilities are "Buildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes." *International Building Code 2000*, International Code Council, Inc. (March 2000), at 292.

Under the International Building Code 2000, which replaces the Uniform Building Code and other model codes and which is scheduled to take effect in Utah on January 1, 2002, site-specific ground motions for design are based on "that motion represented by an acceleration response spectrum having a 2-percent probability of exceedance within a 50-year period," termed the "maximum considered earthquake spectral response acceleration." *Id.* at § 1615.2.1. A 2-percent probability of exceedance in 50 years corresponds to a return period of 2,475 years. *See, e.g.,* DOE-STD-1020-94 at A-1. Although the design earthquake ground motion is selected at two-thirds of the maximum considered earthquake ground motion, an importance factor of 1.5 is applied to essential buildings and structures, which then increases the seismic design requirements. *International Building Code 2000* at § 1615-1617.

The specification of acceptable risk, such as in a reference probability for seismic design, is generally arrived at by community consensus and/or regulatory decision-making. In the case of the International Building Code, community consensus among building officials and design professionals has led to adopting the standard of a 2-percent probability

of exceedance (or equivalently a 98-percent probability of non-exceedance) within a 50-year period. Similarly, the standard for the design ground motion level for highway bridges in the I-15 corridor expansion project in the Salt Lake Valley was selected to correspond to a 10-percent probability of exceedance in 250 years (equivalent to a 2-percent probability of exceedance in 50 years).²

Granting the premise that design requirements for an ISFSI in Utah should be more conservative than requirements found in model building codes— and recognizing the standard of conservatism in Utah for new building and highway construction— a reference probability for the PFS facility corresponding to a 2,000-year return period is less stringent and inadequately conservative by comparison.

Whether one should consider the twenty-year initial licensing period or the thirty- to forty-year operating period for the PFS facility is relevant to calculating the reference probability for design, given some standard of intentional conservatism. Such a probability standard has not yet been set by the NRC for dry cask ISFSIs. In general, assurance of adequate conservatism is commonly made in the form of a probability statement indicating the likelihood of non-exceedance of the design basis values during an exposure period of interest. For a given rate (or return period), the smaller the exposure period, the higher the probability of non-exceedance; so a smaller exposure period gives more favorable "assurance." For example, in its preliminary SER ("PSER"), the Staff stated:

²Crouse et al., *Seismic Hazard Analyses for the I-15 Corridor Expansion Project, Proceedings of the Symposium on Engineering Geology and Geotechnical Engineering*, Boise, Idaho, vol. 32 (1997) at 215-230.

Considering radiological safety aspects of a dry spent fuel storage facility, conservative peak ground motion values that have a 99 percent likelihood of not being exceeded in the 20-year licensing period of the Facility are considered adequate for its design. This exceedance probability corresponds to a return period of 2,000 years.

PSER at 2-45. But the realistic period of exposure to the hazard is not simply the initial licensing period but rather the time period of thirty to forty years (or more) that the ISFSI would be operating. Thus, by the Staff's own logic, a 99-percent probability of not being exceeded in 30 years would require a design value corresponding to a return period of 2,985 years, and for a 40-year exposure period the return period value would be 3,980 years. *See*, e.g., DOE-STD-1020-94 at A-1.

D. Document Request - Utah L, Part B

DOCUMENT REQUEST NO. 1: All documents related to the claims raised by the State in Part B of Utah Contention L, as admitted by the Board in its June 15, 2001 Memorandum and Order.

RESPONSE TO DOCUMENT REQUEST NO. 1: The State objects to this request to the extent that it calls for production of privileged information. Notwithstanding this objection, to the extent that there are any documents responsive to this request they will be available for review at the Office of the Utah Attorney General.

DOCUMENT REQUEST NO. 2: All documents, data or other information generated, reviewed, considered or relied upon by any expert or consultant, including without limitation Dr. Walter J. Arabasz and Dr. Marvin Resnikoff, with respect to Part B of Utah Contention L.

RESPONSE TO DOCUMENT REQUEST NO. 2: *See* documents, which are publically available, cited in specific interrogatory answers. *See also* Response to Document Request No. 1.

DOCUMENT REQUEST NO. 3: All documents relating to the proper standards, as claimed by the State and its experts and consultants, for conducting probabilistic seismic hazard analysis for the PFSF.

RESPONSE TO DOCUMENT REQUEST NO. 3: Sæ Response to Document

Request No. 1.

DOCUMENT REQUEST NO. 4: Copies of all PSHAs performed by or for the State, or by any consultant retained by the State in connection with the PFSF.

RESPONSE TO DOCUMENT REQUEST NO. 4: There are no documents

responsive to this request.

DOCUMENT REQUEST NO. 5: All documents relating to the seismic design standards imposed by the State on the design of buildings, highways and other structures.

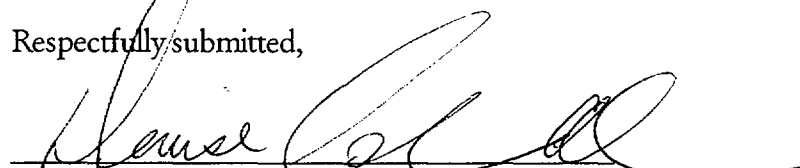
RESPONSE TO DOCUMENT REQUEST NO. 5: The State has already produced

documents responsive to this request. To the extent that new information becomes

available, the State will advise the Applicant.

DATED this 28th day of September, 2001.

Respectfully submitted,



Denise Chancellor, Assistant Attorney General
Fred G Nelson, Assistant Attorney General
Connie Nakahara, Special Assistant Attorney General
Diane Curran, Special Assistant Attorney General
Laura Lockhart, Assistant Attorney General
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CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S OBJECTIONS AND RESPONSE TO APPLICANT'S SEVENTH SET OF FORMAL DISCOVERY REQUESTS TO INTERVENOR STATE OF UTAH was served on the persons listed below by electronic mail (unless otherwise noted) with conforming copies by United States mail first class, this 28th day of September, 2001:

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U. S. Nuclear Regulatory Commission
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Office of the Commission Appellate
Adjudication
Mail Stop: O14-G-15
U. S. Nuclear Regulatory Commission
Washington, DC 20555



Denise Chancellor
Assistant Attorney General
State of Utah

EXHIBIT 1

Declarations of:
Dr. Walter Arabasz
Dr. Steven F. Bartlett
Dr. Marvin Resnikoff

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

PRIVATE FUEL STORAGE, LLC
(Independent Spent Fuel
Storage Installation)

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)

Docket No. 72-22-ISFSI

ASLBP No. 97-732-02-ISFSI

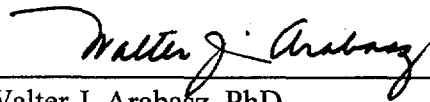
September 27, 2001

DECLARATION OF DR. WALTER J. ARABASZ

I, Dr. Walter J. Arabasz, hereby declare under penalty of perjury and pursuant to 28 U.S.C. § 1746, that the factual statements contained in State of Utah's Objections and Responses to Applicant's Seventh Set of Discovery Requests to Intervenors State of Utah, dated September 18, 2001, are true and correct to the best of my knowledge, information and belief, as they relate to Requests for Admission Nos. 1 and 2 and Interrogatories Nos. 1 through 4(a) and 5 through 8, and document requests relating thereto, for Contention Utah L, Basis B. I have provided responses to these discovery requests in collaboration with my colleague, Dr. James C. Pechmann.

Dated this 27th day of September, 2001.

By: _____



Walter J. Arabasz, PhD
Research Professor of Geology and Geophysics,
University of Utah;
Director, University of Utah Seismograph Stations

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

September 28, 2001

Steven F. Bartlett, Ph.D., P.E.
Assistant Professor
Engineering Department
University of Utah

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

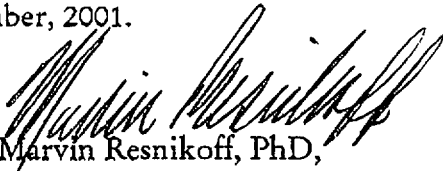
In the Matter of:) Docket No. 72-22-ISFSI
)
PRIVATE FUEL STORAGE, LLC) ASLBP No. 97-732-02-ISFSI
(Independent Spent Fuel)
Storage Installation) September 27, 2001

DECLARATION OF DR. MARVIN RESNIKOFF

I, Dr. Marvin Resnikoff, hereby declare under penalty of perjury and pursuant to 28 U.S.C. § 1746, that the factual statements contained in State of Utah's Objections and Responses to Applicant's Seventh Set of Discovery Requests to Intervenor State of Utah, dated September 18, 2001, are true and correct to the best of my knowledge, information and belief, as they relate to Interrogatories No. 4(c), and document requests relating thereto, for Contention Utah L, Basis B.

Dated this 27th day of September, 2001.

By:


Marvin Resnikoff, PhD,
Senior Associate
Radioactive Waste Management Associates