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UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

DOCKETED 04/16/02

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))	

NRC STAFF'S MOTION IN LIMINE TO EXCLUDE CERTAIN EXHIBITS AND PORTIONS OF THE PREFILED TESTIMONY OF DR. MARVIN RESNIKOFF CONCERNING UNIFIED CONTENTION UTAH L/QQ (GEOTECHNICAL)

<u>INTRODUCTION</u>

Pursuant to 10 C.F.R. §§ 2.730 and 2.743(c), and the Atomic Safety and Licensing Board's "Memorandum and Order (Revised General Schedule)," Attachment A, dated September 17, 2001, the staff of the Nuclear Regulatory Commission ("Staff") hereby requests that the Licensing Board issue an Order, *in limine*, excluding certain exhibits and portions of the prefiled written testimony of Dr. Marvin Resnikoff, which were filed by the State of Utah ("State") concerning Unified Contention Utah L/QQ in this proceeding. For the reasons set forth below, the Staff submits that the exhibits and portions of testimony set forth below either (a) are duplicative of other evidence proffered in this proceeding, (b) lack a proper foundation and/or proper sponsoring witness and therefore do not constitute reliable, admissible evidence, or (c) are irrelevant to the litigation of Unified Contention Utah L/QQ. Accordingly, the Staff respectfully submits that the exhibits and portions of testimony identified herein should be excluded from the record of this proceeding.

¹ See "State of Utah Testimony of Dr. Marvin Resnikoff Regarding Unified Contention Utah L/QQ (Seismic Exemption - Dose Exposure)", dated April 1, 2002 ("Resnikoff Testimony").

DISCUSSION

The standard governing the admissibility of evidence in an NRC adjudicatory proceeding is set forth in 10 C.F.R. § 2.743(c), which specifies that "[o]nly relevant, material, and reliable evidence which is not unduly repetitious will be admitted." To be admissible, the probative value of expert testimony must outweigh its potential for confusion or delay. *Duke Power Co.* (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-669, 15 NRC 453, 475-78 (1982). Probative expert testimony is that which is both helpful to the trier of fact and reliable. *Id.* at 477-78. For opinion testimony to be reliable, the testimony must, in the first instance, be rendered by a properly qualified expert witness. *See*, e.g., *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 592 (1993); *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1091 (1983).²

A. Certain Exhibits Filed by the State Properly Should Be Excluded

The State has filed seven sets of prefiled testimony and a total of 53 exhibits, concerning Unified Contention Utah L/QQ. With respect to the exhibits filed by the State, the Staff respectfully submits that seven of the 53 exhibits proffered by the State should be excluded, as follows.

1. Documents Related to the Commission's Modified Rulemaking Proceeding.

Among the exhibits filed by the State are two exhibits that are duplicative of Exhibits proffered by the Staff, concerning the Commission's proposed Part 72 seismic rulemaking proceeding. These are Utah Exhibit 124 (Staff Requirements Memorandum ["SRM"] dated November 19, 2001) and Utah Exhibit 128 (Excerpts from SECY-01-0178, "Modified Rulemaking Plan . . . "). The Staff has proffered both the SRM and SECY-01-0178 (in its entirety) as part of Staff Exhibit U (items (b) and (c)). These exhibits will be offered into evidence during the Staff's

² A witness may be qualified as an expert with respect to an issue, by virtue of his or her knowledge, skill, experience, training, or education. *See McGuire,* 15 NRC at 475; *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-819, 22 NRC 681, 732 n.67 (1985).

presentation of its witnesses, before the State presents its case on these matters. Accordingly, the admission of Utah Exhibits 124 and 128 would be unduly cumulative and repetitious, and their admission as evidentiary material in this proceeding is altogether unnecessary.

2. Excerpts From the March 8, 2002 Report of Staff Witness Dr. Vincent Luk.

The State has proffered Utah Exhibit 115, which consists of the cover page and 5 pages excerpted from the March 8, 2002 report prepared by Staff witness Dr. Vincent K. Luk of Sandia National Laboratories (pages 32-33, and 35-37). The excerpted pages also appear, without modification, in Revision 1 of that report, dated March 31, 2002 (at pages 33 and 36-38). The March 31 version of the report supersedes the March 8 version that has been proffered, in part, by the State, and has been proffered by the Staff as Staff Exhibit P. Inasmuch as the Staff's proposed exhibit will be offered into evidence during the Staff's presentation of Dr. Luk's testimony (before the State presents its case on these matters), no reason appears why Utah Exhibit 115 should be admitted. Indeed, the admission of Utah Exhibit 115 would be unduly cumulative and repetitious, and it should therefore be excluded from evidence in this proceeding.

3. Documents Which Lack a Proper Sponsoring Witness.

Among its numerous exhibits, the State has proffered four exhibits which lack a proper sponsoring witness, and whose reliability therefore cannot be properly tested in this proceeding:

- (a) Utah Exhibit 100 (a 4-page excerpt from an August 1990 report by F. H. Kulwahy, et al., prepared for the Electric Power Research Institute);
- (b) Utah Exhibit 102 (a 19-page article by Makdisi and Seed, published in the July 1978 issue of the "Journal of the Geotechnical Engineering Division," Proceedings of the American Society of Civil Engineers);
- (c) Utah Exhibit 104 (an abstract and two pages from a paper by Saye and Ladd, entitled "Design and Performance of the Foundation Stabilization Treatments for the Reconstruction of Interstate I-15 in Salt Lake city, Utah"; and
- (d) Utah Exhibit 125 (a 12-page paper prepared for presentation at a 1997 international conference in Lyons, France, by certain NRC employees).

None of the persons who prepared these documents have been proffered as witnesses by the State, and none are available for cross-examination in this proceeding. Moreover, no reason appears why the State could not cross-examine other parties' witnesses with respect to these matters, or why the testimony of its own witnesses could not be admitted and cross-examined to the extent that they rely thereon; for these reasons, the admission of these documents is unnecessary; and, in the absence of a proper sponsoring witness who can be cross-examined for the purpose of establishing the documents' reliability, the documents should be excluded from evidence. See McGuire, supra, 15 NRC at 477-78.

In addition, with respect to the paper prepared by certain NRC employees in 1990 (Utah Exhibit 125), it should be noted that the document contains an explicit "disclaimer" which states that "the views expressed in this paper are those of the authors and should not be construed to reflect the official U.S. NRC position" (Utah Exhibit 125, at 717-8). Accordingly, this document lacks the official imprimatur of the agency, and it therefore should be excluded from the evidentiary record of this proceeding in the absence of a proper sponsoring witness. Moreover, the admission of this document appears to be unnecessary, in that it purports to be an explanation of the Commission's issuance of revised seismic regulations for nuclear power plants and regulatory guidance related thereto (see Utah Exhibit 125, at 717-1 to 717-2). However, the Commission has provided an official explanation of its NPP seismic rulemaking proceeding and regulatory guidance document, as set forth in the statements of consideration published in connection with the rulemaking proceeding and Regulatory Guide 1.165. Accordingly, no reason appears why Utah Exhibit 125 should be admitted, particularly in the absence of a proper sponsoring witness.³

³ The Staff notes that the State has proffered, in Utah Exhibit 127, excerpts from a report co-authored by Staff witness Dr. Rui Chen, concerning the seismic exemption for the Three Mile Island Unit 2 ("TMI-2") ISFSI at the Idaho National Engineering and Environmental Laboratory ("INEEL"). The Staff will discuss this proposed exhibit with the State, and may request the admission of additional portions of the TMI-2 report to supplement the State's excerpts.

4. The Diablo Canyon Application.

In connection with the State's testimony of Drs. Bartlett and Ostadan concerning Part E of this contention, the State proffered Utah Exhibit 133, which consists of four pages from the December 21, 2001 transmittal of an application by Pacific Gas and Electric Co. ("PG&E") for a license to construct and operate an ISFSI at the site of the Diablo Canyon nuclear power plant. In that application, PG&E proposes to use a modified version of the HI-STORM 100 cask system, which differs from the system that has been proposed for use at the PFS site. While it is not entirely clear why the State has proffered this exhibit, it appears that the State seeks to establish that certain fragility curves published in 1994 did not include consideration of unanchored dry cask storage systems. See Bartlett/Ostadan Testimony, Answer 29, at 13. The State's proposed use of Utah Exhibit 133, however, does not appear to establish this point; and, in any event, the State has not proffered an expert or fact witness who can testify as to the meaning, relevance, or reliability of the excerpt taken from the PG&E application. Accordingly, this document should be excluded as irrelevant and lacking a proper sponsoring witness.

B. Portions of Dr. Resnikoff's Prefiled Testimony.

The Staff's review of the testimony of Dr. Marvin Resnikoff, proffered by the State with respect to Part E of this contention, reveals that the witness lacks the proper qualifications (*i.e.*, he lacks the necessary training, education, or experience) to make many of the assertions contained therein. More specifically, a review of Dr. Resnikoff's curriculum vitae (Utah Exhibit 134) indicates that he is trained in physics (with an emphasis in particle physics), and that his work has involved the calculation of radioactive doses. Indeed, the State has previously indicated that it would proffer

Dr. Resnikoff as an expert with respect to the calculation of radioactive doses.⁴ Nowhere in his statement of professional qualifications is there any indication that he is qualified by reason of training, education or experience in civil engineering or structural design.

However, notwithstanding the specific area of his potential expertise, Dr. Resnikoff attempts to address a number of engineering and/or design issues for which he has not been shown to have expertise. Further, his testimony on these issues largely consists of unsupported assertions and generalizations that lack any explicit technical basis, yet which appear to underlie a number of his conclusions concerning dose consequences. Hence, to the extent that Dr. Resnikoff's testimony contains conclusions about dose consequences that are based on unsubstantiated assertions that are outside of his area of expertise, that testimony lacks sufficient basis and should be excluded from evidence as unreliable and lacking a proper sponsoring witness. More specifically, the Staff submits that the following portions of Dr. Resnikoff's prefiled testimony should be stricken.

1. <u>The Initial Angular Velocity of the Canister and Cask/Canister Damage.</u>

With respect to Holtec's hypothetical tipover analysis, Dr. Resnikoff asserts that "[t]here are numerous problems with Holtec's analysis"; he disputes PFS's view that "the initial linear velocity of the casks centroid . . . would not be significantly increased over the [hypothetical] tip-over condition already studied"; and he asserts that "in my opinion, PFS's starting premise of zero initial angular velocity is unfounded." Resnikoff Testimony, Answer 16, at 8. He further states:

⁴ In describing Dr. Resnikoff's "area of testimony," the State indicated that he would testify as to the "[s]eismic exemption, in particular radiation dose limits and consequences." "State of Utah's Objections and Response to Applicant's Eighth Set of Formal Discovery Requests . . . ," dated February 15, 2002. Similarly, the State had previously stated that "Dr. Resnikoff's area of testimony will be the radiological consequences due to the seismic failure of structures, systems, and components important to safety." *See* "State of Utah's Supplemental Response to the Applicant's Seventh Set of Discovery Requests," dated October 23, 2001. Thus, Dr. Resnikoff was not identified as an expert on cask behavior or stability under seismic conditions, or the mechanisms of seismic failure and structural deformation.

If cask tip over results from earthquake accelerations, the initial angular velocity [of the canister] may be greater than zero. From this you can conclude that the top of the canister will decelerate at greater than 45 g, in exceedance of the 45 g design basis, thereby damaging the fuel assemblies; also the HI-STORM 100 cask will flatten more than contemplated by PFS. Claims that the "MPC has a very substantial margin built into it" are unsubstantiated; PFS has again failed to support its site specific use of the HI-STORM cask with any calculations or test data. See PFS Joint Dec. ¶ 20. Therefore, PFS has not substantiated whether or not the confinement boundary would be breached in a 2,000-year or a 10,000-year earthquake."

Id. No showing has been made that Dr. Resnikoff is qualified as an expert with respect to these matters, such as cask or canister motion or deceleration under seismic conditions, or whether the confinement boundary would be breached in a seismic event. Moreover, no basis has been provided for Dr. Resnikoff's conclusions that, "in my opinion, PFS's starting premise of zero initial angular velocity is unfounded," and "the initial angular velocity will be greater than zero," Id.; and Dr. Resnikoff fails to point to any other testimony or evidence that would support these assertions. Such unsubstantiated conclusory statements -- even by a qualified expert witness -- will not assist the Licensing Board's consideration of this issue and should be disregarded. See Limerick, supra, 22 NRC at 735 (no weight should be given to the testimony of an asserted expert witness who can supply no scientific basis for his statements other than his belief). A fortiori, such testimony should be excluded where it is offered by a witness who lacks the necessary expertise to reach the conclusions presented. Accordingly, all of Dr. Resnikoff's Answer 16, concerning the initial angular velocity of the canister, fuel assembly damage, breach of the confinement boundary, and cask flattening (as well as the restatement of his conclusions in Answer 17), should be excluded from the record as lacking proper foundation and reliability.

2. <u>Concrete Flattening and Rolling of the Cask</u>

In his testimony, Dr. Resnikoff further asserts that "the HI-STORM 100 cask will also flatten more than contemplated by PFS," and he asserts that:

[I]n the event of cask tipover, PFS has not correctly quantified the amount of concrete flattening or the resultant reduction of gamma and neutron shielding. Thus, the potential consequence of a HI-STORM 100 cask tipover is another unresolved critical safety issue that must be addressed prior to determining or justifying the appropriate site specific design basis earthquake.

Id., Answer 17, at 8. This portion of Dr. Resnikoff's proffered testimony (*i.e.*, Answer 17) lacks both a proper foundation and a proper sponsoring witness, and it should therefore be excluded.

Similarly, Dr. Resnikoff proffers his opinion, in Answer 18 of his testimony, that "[d]uring a seismic event, the cask could roll and the flattened end may not remain facing the ground." *Id.*, Answer 18, at 9. Potential flattening of the cask concrete and movement of the cask during a seismic event are issues pertaining to structural deformation and behavior of the cask, which do not fall within Dr. Resnikoff's area of expertise or the State's identification of his proposed areas of testimony; further, even if Dr. Resnikoff were qualified to address this issue, he fails to provide any scientific basis for his assertions, or for his conclusion that the Applicant's assessment of concrete flattening is inadequate.⁵ Accordingly, this portion of Dr. Resnikoff's testimony lacks proper foundation and a proper sponsoring witness, and should be stricken.

Deposition Transcript of Marvin Resnikoff (October 29, 2001), at 81-82. In his prefiled testimony, Dr. Resnikoff has not pointed to any calculations, analyses, or other basis for his testimony concerning deformation of the cask, that would support his conclusory assertion that "PFS has not correctly quantified the amount of concrete flattening."

⁵ The following excerpt from the October 29, 2001deposition of Dr. Resnikoff demonstrates that Dr. Resnikoff is not qualified to testify as to the adequacy of the Applicant's assessment of potential cask flattening upon a hypothetical cask tipover, and that he lacks sufficient basis for his criticism:

Q: Have you ever done a calculation for deformation or flattening of the concrete cask?

A. No

Q: How are you going to figure out a way to calculate the effect of the flattening or deformation of the concrete cask on the canister?

A: As we sit here, I don't know how that calculation would proceed. We would be in consultation with the engineers. The State has to discuss how that would go.

3. Additional Damage to the Cask and Canister.

In his testimony, Dr. Resnikoff further discusses Holtec's analysis of the amount of lid plate displacement that may occur in a seismic event, and then provides the following opinion:

This indicates to me that the 3 3/4 inch thick lid plate is going to

strike the ground in a tipover event and send a strong dynamic impulse to the cask wall and canister. It does not appear that this cask detail, that may affect the canister welds, has been modeled.

Id., Answer 21, at 10. Again, such predictions about structural deformation or damage to the cask and/or canister are beyond Dr. Resnikoff's area of potential expertise, and no scientific basis has been provided to support these conclusions. Accordingly, his testimony on this issue (i.e.,

Answer 21) lacks proper foundation and a proper sponsoring witness, and should be stricken.

4. <u>Likelihood of Cask Tipover.</u>

At numerous places in his prefiled testimony, Dr. Resnikoff asserts that "the HI-STORM 100 casks will <u>likely</u> tipover under peak ground accelerations for a 2,000-year mean annual return period earthquake," or he refers to "the likelihood" that the casks will tip over. *Id.*, Answer 13, at 7; Answer 20, at 10 (emphasis added). Dr. Resnikoff's opinions concerning the likelihood of cask tipover fall outside the area of his potential expertise, and therefore lack reliability; in addition, his opinions concerning this matter lack scientific basis (except in those instances where he specifically refers to the testimony of other experts, *e.g.*, Answer 23, at 11). Inasmuch as these unsupported assertions lie outside Dr. Resnikoff's area of potential expertise and lack a proper sponsoring witness, they should be stricken.

In addition, Dr. Resnikoff states that "[t]he Altran Report, State's Exhibit 122 concludes that the HI-STORM 100 casks will tipover under peak ground accelerations induced by a 2,000-year earthquake at the PFS facility." *Id.*, Answer 24, at 11-12, (citing "Testimony of Drs. Khan and Ostadan (cask stability)"; emphasis added). However, Dr. Resnikoff's interpretation of the Altran Report is incorrect; neither the Altran Report nor the related testimony of Drs. Khan and Ostadan

on cask stability concludes that cask tipover is a "likely" event under the design basis 2,000-year ground motions. Rather, the Khan/Ostadan testimony states that the casks may or could "potentially tipover," or that there is a "potential" for tipover; the testimony does not appear to conclude that cask tipover is "likely." Similarly, the Altran Report appears to conclude only that "it is possible" that "the HI-STORM 100 cask could overturn (i.e., tip over) during a high-level seismic event." Thus, to the extent that Dr. Resnikoff's testimony asserts that cask tipover is "likely," it mischaracterizes the conclusions contained in the Altran report and the testimony of Drs. Khan and Ostadan, and otherwise lacks a proper foundation and a proper sponsoring witness. Therefore, these assertions should be stricken.

Fuel Burnup at the TMI-2 ISFSI at INEEL.

In the prefiled testimony of Dr. Resnikoff, the State asks "one final question," as to whether Dr. Resnikoff is "aware of the burn-up of fuel stored in the ISFSI at INEEL where the TMI-2 fuel is stored." In response, Dr. Resnikoff provides his views as to the fuel burn-up at the TMI-2 ISFSI, and his opinion that the fuel burnup there is "far less than the potential burnup of fuel that will be accepted at PFS, up to 45,000 MWD/MTU." Resnikoff Testimony, Answer 28 at 13.8 No showing has been made by the State, however, as to the relevance of this question and answer, nor has the State connected it to any issue or other testimony before the Board. Accordingly, Question and Answer 28 should be stricken as irrelevant.

⁶ See Testimony of Dr. Mohsin Khan and Dr. Farhang Ostadan on Unified Contention Utah L/QQ, Part D (Cask Stability), dated April 1, 2001, Answer 4, at 2; Answer 16, at 6; Answer 25, at 10; and Answer 33, at 13.

⁷ See "Analytical Study of HI-STORM 100 Cask System for Sliding and Tip-Over Potential During High-Level Seismic Event," Technical Report No. 01141-TR-000, Revision 0 (Dec. 11, 2001) ("Altran Report"), Utah Exhibit 122, at 16 and 20; emphasis added.

⁸ The Staff notes that a more precise statement of the fuel burn-up rate and cooling time limits under the HI-STORM 100 CoC, and the Applicant's calculation of the average burnup rate and cooling times for fuel to be stored at the PFS Facility, are set forth in the Staff's Consolidated SER (Staff Exhibit C), at 7-2 to 7-3.

CONCLUSION

For the reasons set forth above, the Staff respectfully submits that the exhibits and portions of testimony identified herein should be excluded from evidence in the litigation of Unified Contention Utah L/QQ.

Respectfully submitted,

/RA/

Sherwin E. Turk Martin J. O'Neill Counsel for NRC Staff

Dated at Rockville, Maryland this 15th day of April, 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)))

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S MOTION IN LIMINE TO EXCLUDE CERTAIN EXHIBITS AND PORTIONS OF THE PREFILED TESTIMONY OF DR. MARVIN RESNIKOFF CONCERNING UNIFIED CONTENTION UTAH L/QQ (GEOTECHNICAL)," 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 15th day of April, 2002:

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