

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

In the Matter of:

Docket No. 72-22-ISFSI

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

ASLBP No. 97-732-02-ISFSI

March 25, 2002

STATE OF UTAH'S MOTION IN LIMINE TO EXCLUDE
APPLICANT'S PREFILED DIRECT TESTIMONY OF
JAMES L. COLE, JR., WAYNE O. JEFFERSON, JR., AND RONALD E. FLY

The State of Utah moves the Board to strike the Applicant's prefiled direct testimony, relating to Utah K, of James L. Cole, Jr., Wayne O. Jefferson, Jr., and Ronald E. Fly or to enter alternative orders consistent with this motion. This motion is based on the following grounds: the testimony is improperly presented in panel form; the testimony does not identify which witness has personally sponsored the 142 substantive answers contained in the testimony; each witness is not a qualified expert for the subject matter of every question; each witness does not have a foundational basis for every answer; the testimony contains expert opinions of unidentified persons; and the testimony is based on unreliable methodology.

FACTUAL BACKGROUND

1. On February 19, 2002, Applicant filed the Testimony of James L. Cole, Jr., Wayne O. Jefferson, Jr., and Ronald E. Fly on Aircraft Crash Hazards at the PFSF - Contention Utah K/Confederated Tribes B ("panel testimony").
2. Witness Fly has experience as an F-16 pilot and experience flying in the Utah Test and Training Range ("UTTR") airspace above the proposed PFS site; witnesses Cole and Jefferson do not have such experience, although many answers purport to opine on the circumstances of F-16

pilots flying in the UTTR airspace. See panel testimony, Answers 3, 7, 11, 15, 19, 23.

3. Witness Cole has been assisting PFS in this matter since late 1998, but witness Fly did not begin assisting PFS until one year later, after Cole had attended four meetings with Air Force officials where he purportedly received information which is cited as the basis for several answers given not only by Cole, but also by Fly who obviously does not have the same basis for his answer as Cole. Id. A7, A23, A81 and n. 42, A38.

4. Witness Jefferson did not begin assisting PFS until “mid-1999” and, like witness Fly, did not attend the meetings with Air Force officials attended by Cole, nor did Jefferson take part in “a series of conversations” with Air Force officials in late 1998 and the first part of 1999. All three panel members cite the meetings attended by Cole as the basis for several answers although Jefferson obviously does not have the same basis for his answer as does Cole. Id. A15; PFS’ Prefiled Exh. O (Revised Addendum, *Aircraft Crash Impact Hazard at the PFS Facility* (July 20, 2001), n.7 at 2.

5. Witness Fly did not “get involved” with the methodology, did not do the statistical analysis, did not do the probability calculations and did not gather data, such as accident statistics, and did not do the research for traffic at Michael Army Airfield. Fly Deposition Transcript (“Tr.”) (December 12, 2000) at 52-54. The panel testimony is replete with joint answers including “we requested accident reports” (A119); “we calculated crash impact probabilities” and “we solicited and received information from the Air Force, Hill AFB and Michael Army Air Field including accident reports” (A28); “[w]e calculated the probability” (A40); “we calculated the annual crash probability” (A46); “[w]e originally obtained data from Hill AFB” (A48); “[w]e were initially advised” (citing telephone conversation with Cole only) (A50); and “[as] a sensitivity analysis excursion, we have examined” (A52).

6. Except for the first 24 questions concerning the witnesses’ names and qualifications, the

remaining 142 questions and answers are neither directed to a specific panel member nor do the answers identify the panel witness making the answer.

ARGUMENT

I. The Applicant has improperly offered the testimony of three witnesses in the panel format rather than providing their individual testimony.

As this Licensing Board has stated, the panel format of proffered testimony is not acceptable absent clear and compelling reasons:

The parties are reminded that all proffered written testimony should be in Question and Answer form and should be read in that form at the evidentiary hearing. It is also requested that witnesses testify individually rather than in panels, unless there is some clear and compelling reason for using the panel format. This enables the Licensing Board to better apply the usual tests of the credibility of witnesses and the weight to be given their testimony by such factors as demeanor and appearance on the witness stand, freedom from bias or partisanship, objectivity, and the like.

Safety Light Corp. (Bloomsbury Site Decontamination), 1991 WL 307322 (N.R.C.), 3 (1991).

None of the 142 substantive questions in the panel testimony indicate to whom the question is directed, and none of the answers indicate which witness or witnesses are responding.

The witnesses have different qualifications and have undertaken distinct roles with respect to the aircraft crash analysis.¹ The analysis primarily concerns the calculation of crash probabilities based on the characteristics of F-16 missions flown through the Utah Test and Training Range airspace under which the proposed PFS site is located. Of the three panel witnesses, only Fly has piloted F-16s on missions through the UTTR airspace and only Fly has been stationed at Hill AFB where such missions originate. Witness Fly, however, states that he did not gather data, did not become involved with methodology, and did not do probability calculations nor statistical analysis.

As a result, the joint answers of the panel testimony are often contrary to the express

¹ *Aircraft Crash Impact Hazard at the Private Fuel Storage Facility*, Rev. 4, August 10, 2000 ("Crash Report"), and Addenda thereto (January 19, 2001 and July 20, 2001)

statements previously given by individual witnesses in this proceeding. Without exhausting the incidents where this is apparent, the following examples are typical:

Fly Tr., at 52, 54:

Things I did not do: Any of the - like the Kimura et al. methodology, I didn't get involved with that. Calculation of the impact area, I didn't do those types of things. So the statistical analysis was done by others. . . I did not do the calculations with - that drives this number to this, you know, and you wind up with this probability. I did not do the probability calculations.

Panel testimony:

Q26. Where is your assessment documented?

A26. Our assessment is set forth in a formal report, identified as [Crash Report and Revised Addendum]. . .

Q27. In short, what did you determine regarding the aircraft crash hazard to the PFSF?

A27. We found . . . a probability of an accident of less than $4.17 \text{ E-}7$ per year.

Q28. How did you determine that probability?

A28. We generally followed the procedures of . . . DOE STD 3014-96 and . . . NUREG 0800. We calculated crash impact probabilities for each of the aviation activities . . .

Thus, unless the panel testimony is stricken, voir dire or cross-examination of each witness will be required on each question to first ascertain the portion of the answer, if any, that each witness claims to have personally sponsored. Obviously, no meaningful cross-examination can be conducted of a panel member who merely bases his answer on the assertion or work of a co-member of the panel. After the sponsoring witness of a relevant statement is determined, further cross examination can then be conducted to elicit the qualifications and other requirements relating to that panel member's ability to answer or opine as to that specific statement. This process will be exceedingly time consuming and confusing to all participants. Rulings on the

admissibility of particular statements by a particular witness will be difficult to address because each panel member claims the full answer to each of 142 questions as his own. Some answers are as lengthy as one full page.

The Board has recognized the necessity of knowing the identity of the witness sponsoring specific statements in prefiled testimony. The time consuming task of ascertaining which witness has sponsored an answer or portion thereof should not be undertaken at the hearing to the detriment of the Board and parties, but should be clear from the prefiled testimony itself:

. . . the Board began the practice of ascertaining of each witness in a panel which portions of the prefiled testimony that witness personally sponsored. This information should be set forth in prefiled testimony.

Carolina Power and Light Company (Shearon Harris Nuclear Power Plant, Units, 1, 2, 3, and 4), LBP-79-19, 10 N.R.C. 37, 107 (1979). The State is unable to conclude at this time the extent to which the panel testimony is objectionable due to lack of expert qualifications, foundation, hearsay or other infirmities. If allowed in its present form, the separation of the panel testimony into individual answers will have to be done at the hearing and motions then made accordingly. The panel testimony of Applicant should be stricken or in the alternative, Applicant should be ordered to amend the panel testimony no later than five days prior to the hearing, by identifying the answer or portions thereof personally sponsored or claimed by a specific witness.

II. PFS's prefiled testimony contains inadmissible hearsay which should be stricken.

Although hearsay may be admitted in NRC adjudicative proceedings, "Only relevant, material, and reliable evidence which is not unduly repetitious will be admitted." 10 CFR § 2.743(c). Further, "[e]xpert testimony in hearsay form from someone unknown is most unreliable." Tennessee Valley Authority (Hartsville Nuclear Power Plant Units 1A, 2A, 1B and 2B), ALAB-367, 5 NRC 92, 121 (1977). Contrary to these standards, the prefiled testimony of

Applicant states:

Q132. How many aircraft use the Moser Recovery Route?

A132. Based on information from local air traffic controllers, conservatively estimated (we doubled the controllers' estimate), the Moser recovery route is used by less than five percent of the aircraft returning to Hill.

No further information is given as to what the actual "information" was, the identity or number of air traffic controllers giving the information, where the air traffic controllers are employed, nor the basis for the estimates made. To make such an estimate, the controllers would have had to estimate not only the volume of flights on the Moser Recovery Route ("MRR"), but would also have had to estimate the total flights that return to Hill AFB from all routes, without which one could not opine as to the percentage of return flights that travel on the MRR. The fact that the controllers opined that the information was "conservatively estimated" confirms the controllers' belief that the information does not represent the actual volume of traffic on the MRR. Such opinions could clearly be rendered only by experts demonstrating a basis to make estimates of such specific military flight activity and to judge the conservativeness of their estimate.

Furthermore, the "conservative estimate" itself is not even disclosed other than it is a number that after being "doubled" by the panel witnesses, amounted to less than 5 percent. In contrast to this testimony, previous references to the controllers' estimate omitted any reference to the fact that it had been doubled by the panel witnesses.² Because the actual estimate of the controllers has never been disclosed, PFS has been able to describe it as "less than five percent" and as less than five percent after "we doubled the controllers' estimate." Thus, PFS has

² "Based on information from local air traffic controllers, conservatively estimated, the Moser recovery is used by less than five percent of the aircraft returning to Hill." Declaration of James L. Cole, Jr., Wayne O. Jefferson, Jr., and Ronald E. Fly (December 30, 2000), ¶ 46.

"Based on information received from local air traffic controllers, conservatively estimated Moser Recovery would be used by less than 5 percent of the aircraft returning to Hill AFB." Crash Report, at 48a-49.

manipulated the number, apparently to suggest a conservative approach, while continuing to conceal the number itself and prevent its scrutiny.

This hearsay opinion testimony of an undisclosed amount, opined by persons unknown, is most unreliable and should be stricken from all testimony and from the Crash Report.

III. The testimony relating to the calculation of the probability of an aircraft crash at the proposed PFS facility should be stricken since it is based on unreliable methodology.

Only relevant, material, and reliable evidence which is not unduly repetitious will be admitted in an NRC adjudicative proceeding. 10 CFR § 2.743. Since Commission Rules of Practice do not expressly address expert testimony, the Federal Rules of Evidence provide appropriate guidance.³ Federal Rule 702, amended in 2000 in response to Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993), provides (with emphasis added):

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

The ultimate issue addressed by the panel testimony is the probability of an aircraft crash impacting the proposed PSF facility. The Crash Report, claimed by the panel as its assessment of probability, acknowledges the NUREG-0800 methodology formula for calculating that probability: $P = N \times C \times A/W$.⁴ The panel witnesses suggest that they have conformed to this methodology by using a formula "based on NUREG-0800": $P = N \times C \times A/W \times R$, where "R = a factor that accounts for the reduction in crash hazard resulting from the pilot's ability to avoid impacting the

³ See, eg, Duke Power Company (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-669, 15 N.R.C. 453, 475 (1982).

⁴ Crash Report, at 6.

PFS site.” Panel testimony A40. The panel witnesses then assign a value of 14.5% to R , thereby obtaining a crash probability of only 14.5% of the probability calculated under the NUREG-0800 methodology. Id. A45. Thus, the witness panel has reduced the NUREG-0800 probability of impact for F-16s transiting Skull Valley from 2.14×10^{-6} (which alone is twice the threshold standard of 1×10^{-6}) to the probability of 3.11×10^{-7} , which the panel adopts as its testimony (A28).

Employing a reduction factor R to substantially eliminate the NUREG-0800 probability is not a method “based on” NUREG-0800 but a glaring rejection of that methodology. The panel witnesses have invented a new methodology which focuses on quantifying a pilot’s ability to steer a crashing aircraft away from the site under evaluation, a concept not recognized by NUREG-0800. Testimony based on this new methodology is unreliable and should be rejected.

In Daubert, the Supreme Court set forth specific factors for use in assessing whether the methodology employed by an expert is reliable: (1) the knowledge or theory can be and has been tested; (2) the knowledge has been subjected to peer review and publication; (3) the potential rate of error has been examined, and (4) the knowledge is generally accepted by the scientific community. Daubert, 509 U.S. at 593-594.

The value assigned to R is a subjective estimate. It purports to be the probability that a pilot in an aircraft which is about to crash, would not be able to steer the crashing aircraft away before ejecting from the aircraft. There is no statistical data kept by the Air Force or other organization on the success rate of F-16 pilots or other pilots in identifying or avoiding specific ground sites in a crash situation.⁵ In the absence of actual data, the panel witnesses have reviewed accident reports and subjectively determined which reports described a situation where they believed the pilot would have been able to control the aircraft for enough time to take avoidance

⁵ State of Utah’s Prefiled Testimony of Colonel Hugh Horstman (U.S.A.F. Ret.) for Contention Utah K/Confederated Tribes B (“Horstman Testimony”), February 19, 2002, A. 64.

action before ejecting. After concluding that enough time was available to take avoidance action, the panel (none of whom have themselves ejected in an emergency) made the subjective conclusion that the pilot in 95% of such circumstances, would have taken successful steps to locate and avoid a ground site such as the PFS facility before ejecting.⁶

There are no studies, published works, or authorities that have previously attempted to quantify the probability that pilots in a crash situation would avoid a ground site, nor has a theory to quantify such a factor been presented for peer review.⁷ No previous NRC licensing proceedings have involved quantifying a pilot's ability to avoid crashing into a ground facility.⁸ And possibly the most telling sign of the unreliable nature of such estimates is the absence of any reference to quantifying a pilot's ability to avoid a crash in the extensive works published by the DOE and NRC on the methodology of aircraft crash probability.⁹ A factor so overwhelming as to substantially eliminate the probability of a crash into a ground facility cannot reasonably be thought to have been overlooked by the authors of the DOE-Std-3014-96 *Accident Analysis For Aircraft Crash into Hazardous Facilities*, October 1996; NUREG-0800 *Standard Review Plan for Nuclear Power Plants*; UCRL-ID-124837, Kimura, et al, Lawrence Livermore National Laboratory, *Data Development Technical Support Document for the Aircraft Crash Risk Analysis Methodology ("A CRAM") Standard*, August 1, 1996; and other authorities. Rather, it is obvious that the proposition of quantifying a pilot's ability to avoid a crash in an emergency situation is so unreliable as to not merit consideration in the published authorities.

⁶ Crash Report, Tab H, at 3.

⁷ Horstman Testimony, A. 64, A. 65.

⁸ State of Utah's Prefiled Testimony of Dr. Marvin Resnikoff for Contention Utah K/Confederated Tribes B ("Resnikoff Testimony"), February 19, 2002, A. 10; NRC Staff's Response to State's Sixteenth Set of Discovery Requests, January 2, 2002, p. 11 (response to Interrogatory 10).

⁹ Resnikoff Testimony, A. 6, A. 10.

The methodology used by the panel witnesses do not meet any of the Daubert factors for reliability. Testimony based on such a totally unfounded and unrecognized method should not be admitted on the assumption it will be scrutinized by cross-examination. The Board is charged with the responsibility of acting as gatekeeper to exclude unreliable expert testimony. Daubert at 592; FRE 702 Advisory Comm. Notes, 2000 Amendments. All testimony relying on the methodology of quantifying a pilot's ability to avoid the proposed PFS site should be stricken as unreliable.

CONCLUSION

The Board should strike the panel testimony of Applicant since it is an improper format and prevents assessment of the qualifications of the individual witnesses. In the alternative, the Board should order the testimony to be amended and refiled not later than five days prior to the hearing, or within sufficient time for the State to review the amended testimony, to prevent lengthy and confusing voir dire and cross examination to ascertain the basis each witness may or may not have to answer each question or portion thereof.

All testimony based on opinions of unidentified "local air traffic controllers" should be stricken on the basis that it is the most unreliable hearsay testimony.

All testimony based on the methodology of quantifying a pilot's ability to avoid the proposed PFS site should be stricken as unreliable.

DATED this 25th day of March, 2002.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S MOTION IN LIMINE TO EXCLUDE APPLICANT'S PREFILED DIRECT TESTIMONY OF JAMES L. COLE, JR., WAYNE O. JEFFERSON, JR., AND RONALD E. FLY was served on the persons listed below by electronic mail (unless otherwise noted) with conforming copies by United States mail first class, this 25th day of March, 2002:

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