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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
) (Independent Spent Fuel
) Storage Installation

) ASLBP No. 97-732-02-ISFSI

) April 1, 2002

**MEMORANDUM IN OPPOSITION TO APPLICANT’S MOTION TO STRIKE
PORTIONS OF STATE OF UTAH’S PREFILED TESTIMONY OF DR.
MARVIN RESNIKOFF REGARDING UTAH CONTENTION K/
CONFEDERATED TRIBES CONTENTION B.**

INTRODUCTION

PFS has filed Applicant’s Motion to Strike Portions of State Of Utah’s Prefiled Testimony of Dr. Marvin Resnikoff Regarding Utah Contention K/ Confederated Tribes Contention B (“Motion”). Applicant’s Motion is without merit and should be denied as fully explained in the following Memorandum.

DISCUSSION

A. Motion to strike Dr. Resnikoff’s testimony as irrelevant and beyond scope of Utah K.

State witness Dr. Resnikoff testifies that “An F-16 engine traveling at an average speed of 420 knots will breach the side of a Holtec HI-STORM 100 cask.” Resnikoff Testimony at 22. Dr. Resnikoff further states that “at a distance of 100 m from the impact location, the committed dose equivalents due to inhalation range from 70 rems to 3.300 rems due to the release of cesium and CRUD.” Id. at 26, 27. PFS argues that such portions of Dr. Resnikoff’s testimony which are related to the potential consequences of aircraft

crashes should be stricken as “not probative and irrelevant to determining the probability of such a crash occurring.”

The consequences of crashes, however, are necessarily within the scope of Contention Utah K, in addition to the calculation of impact probability. The Board has previously rejected the assertion that testimony regarding consequences is outside the scope of this contention:

In this regard, we do not accept the staff’s assertion that the State’s argument regarding consequences is outside the scope of this contention. See Staff Motion to Strike Response at 1 n. 1. As the discussion of the applicable benchmark standard in the PFS summary disposition motion suggests, in this context the State’s challenge to the adequacy of the PFS discussion of credible accidents necessarily encompasses the bases upon which those accidents are asserted to be credible.

LBP-01-19, 53 NRC 416 (2001), slip op., at 21, n. 5.

The State notes that four PFS witnesses address the subject of consequences in their prefiled testimony, and the eight-page testimony of PFS witness Jeffrey Johns is devoted entirely to this subject.¹ Further, the 15-page PFS Hearing Exhibit Z is devoted entirely to consequences of a crash impact. PFS suggests no reason why PFS alone should be able to address consequences of an impact.

Secondly, PFS notes that Dr. Resnikoff has included the calculated impact probability of a general aviation crash in determining the cumulative impact probability. PFS claims this is improper because the Board ruled that the general aviation hazard was negligible. More precisely, the Board stated that the PFS material factual statements were

¹Testimony 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 (“PFS panel testimony”), at 110, 111; Testimony of Jeffrey Johns on Aircraft Crash Hazards at the PFSF - Contention Utah K/Confederated Tribes B (entire testimony limited to this subject).

not disputed and “[w]e thus grant the PFS motion for summary disposition with respect to general aviation.”² The three material statements of fact submitted by PFS in support of general aviation did not mention an impact probability but averred only that “the hazard to the PFSF facility from general aviation impacts is negligible,” i.e., small in degree.³ In fact, the declaration of PFS witnesses in supporting summary disposition urged the calculated impact probability of 5.25 E-7 for general aviation.⁴ PFS, therefore, did not claim as a material fact that the impact probability was zero, but rather claimed as a material fact that the hazard from impact (as opposed to the probability of impact) was “negligible,” an assertion that could be made consistently with both the calculated impact probability of 5.25 E-7 and the PFS witness assertions that spent fuel casks would withstand an impact from general aviation aircraft.⁵

The probability of an impact from general aviation is necessary in determining the cumulative probability. PFS has submitted prefiled witness testimony which now claims the probability of impact from general aviation is $<1 \times 10^{-8}$ and uses that value to determine cumulative impact probability.⁶ If the Board had previously ruled on the impact probability for general aviation, PFS would presumably be using the value so determined rather than

²LBP-01-19, 53 NRC 416 (2001), slip op. at 28.

³PFS Statement of Material Facts in support of motion for summary disposition of Utah K (November 9, 2001), at 11.

⁴“Accordingly, the average annual crash impact probability for general aviation is 5.25 E-7.” Id., at 23.

⁵“Despite the calculated impact probability, however, the crash impact hazard to the PFSF from general aviation is, as a practical matter, zero because the spent fuel storage casks would be able to withstand the crash impact of the general aviation aircraft that might be found in Skull Valley.” Id.

⁶PFS panel testimony, at 110.

$<1 \times 10^{-8}$, an estimate first offered by PFS in the Revised Addendum to the Crash Report⁷, July 20, 2001, two months after the Board's Memorandum and Order on summary disposition.⁸

Like PFS, the State has prefiled witness testimony wherein a calculated probability of impact for general aviation is used to determine cumulative impact probability. More specifically, State witness, Dr. Resnikoff, has used the probability of impact for general aviation claimed by PFS in its Crash Report, 2.36×10^{-7} .⁹

The claim that portions of Dr. Resnikoff's testimony should be stricken is without merit.

B. Motion to Strike the Testimony of Dr. Resnikoff as Unreliable.

PFS contends that Dr. Resnikoff's testimony was "dismissed" and found "unreliable" by the Commission in its Order determining the applicable threshold probability for design basis events to be 1×10^{-6} . The Commission's sole reference to Dr. Resnikoff is in footnote 42 where the Commission notes that Dr. Resnikoff's declaration (citing paragraph 16) is not sufficiently probative to raise an issue of material fact *as to the issue of whether to adopt the threshold design probability for reactors or for a GROA*.¹⁰ Contrary to the claim of PFS, the declaration was not "dismissed" nor found to be "unreliable" nor does either of those words even appear in footnote 42.

⁷ *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).

⁸ LBP-01-19, 53 NRC 416 (2001) (entered May 31, 2001).

⁹ Crash Report, at 87.

¹⁰ CLI-01-22, 2001, ___ NRC ___, slip op., at 14.

Further, paragraph 16 cited by the Commission, as well as all paragraphs from 10 through 18 which addressed the “Applicable Probability Standard” are not contained in the current prefiled testimony of Dr. Resnikoff.

PFS asserts that the testimony of Dr. Resnikoff “does not explain all of the input data and assumptions underpinning [his] analysis,” and that “the methodology and principles used by Dr. Resnikoff remain obscure.” PFS, however, does not point to a single instance where a needed assumption is claimed to be lacking or identify any part of the analysis that is claimed to be “obscure.”

PFS further argues that in its Order affirming the Board’s ruling on the threshold probability of 10^{-6} , the Commission also “found that the bounding GROA accident radiation dose consequences were roughly 20 rems.” PFS then asserts that Dr. Resnikoff’s testimony as to committed dose equivalents in the range from 70 to 3,300 rems “makes it reasonable to conclude that Dr. Resnikoff’s testimony is unreliable.” First, the Commission’s Order concerning threshold probability did not make any finding as to bounding accident radiation doses for a GROA. CLI-01-22, slip op. at 2 (“We note that the issue we consider today is only the threshold probability for accidental events. . .”). The only reference by the Commission to radiation doses was a reference to the rules adopted in 1996 establishing dose limits for a GROA. 61 Fed. Reg. 64257 (1996). Dose limits are established to protect the health and safety of workers and the public; they are not calculated radiation doses released due to a particular accidental event.¹¹ The fact that the calculated

¹¹ Id. at 64261 (The Commission believes that these standards [adopting 5 rem dose limit] continue to be appropriate for its licensees and provide adequate protection of worker and public health and safety at a repository.)

radiation release under specific accidental circumstances is substantially higher or lower than a dose limit set for human safety reasons obviously says nothing about the reliability of either.

Finally, PFS asserts that based on “everyday experience,” Dr. Resnikoff’s testimony should be stricken as unreliable. PFS reasons that a cask is 200 times more massive than an inert bomb, and “based on basic principles of physics” the acceleration felt by the cask would be one two-hundredth of the deceleration felt by the bomb, a principle not recognized by Dr. Resnikoff. No reference to any authority is made for this claimed oversight. Actually, the kinetic energy of an incoming bomb goes as $\frac{1}{2} mv^2$ and the resultant velocity and accelerations of the cask would go as the square of the mass, and would not have a resulting acceleration of one two-hundredth as everyday experience may suggest. Also, the relative masses are actually two tons for an MK-84 bomb and 135 tons for a HI-STORM cask. PFS has offered no more than an attempted cross-examination of Dr. Resnikoff on the details of his calculations. PFS will have a full opportunity to explore Dr. Resnikoff’s calculations at the hearing.

C. Motion to strike Dr. Resnikoff’s testimony as beyond a design basis accident.

PFS moves to strike the testimony of Dr. Resnikoff as it relates to the penetration of a spent fuel storage cask and the accompanying release of radiation, claiming the consequences of an aircraft impact are irrelevant to calculating the probability of a design basis accident. This claim ignores the very meaning of design bases:

“design bases” should be understood in relation to that range of events, including external natural or man-induced events, that is taken into account in the design, and, in particular, in relation to conditions that could result in radiological consequences beyond specified limits.

61 Fed. Reg. 64257, 64262-3 (1996).

The consequences of aircraft crashes are necessarily within the scope of Contention Utah K in addition to the calculation of impact probability. The Board has previously rejected the assertion that testimony regarding consequences is outside the scope of this contention:

In this regard, we do not accept the staff's assertion that the State's argument regarding consequences is outside the scope of this contention. See Staff Motion to Strike Response at 1 n. 1. As the discussion of the applicable benchmark standard in the PFS summary disposition motion suggests, in this context the State's challenge to the adequacy of the PFS discussion of credible accidents necessarily encompasses the bases upon which those accidents are asserted to be credible.

LBP-01-19, 53 NRC 416 (2001), slip op., at 21, n. 5.

For purposes of its summary disposition motion, PFS assumed that an aircraft strike would, in fact, cause a radioactive release. It was only due to this assumption of radiological consequences that the Board noted that Dr. Resnikoff's testimony regarding the consequences of a strike was of little relevance:

we note that, given the PFS assumption that an aircraft or associated ordnance strike will cause a radioactive release . . . Dr. Resnikoff's assertions about ordnance penetration... appear to have little relevance . . .

Id., at 37, n. 9. The suggestion of PFS that the testimony of Dr. Resnikoff regarding consequences was found to be outside the scope of Contention Utah K is simply false.

The State notes that the PFS motion to strike testimony relating to consequences is silent on the fact that four PFS witnesses address the subject of consequences in their prefiled testimony, and the eight- page testimony of PFS witness Jeffrey Johns is devoted

entirely to this subject.¹² Further, the 15-page PFS Exhibit Z is devoted entirely to consequences of a crash impact. PFS suggests no reason why PFS witnesses alone should be permitted to testify to the consequences of aircraft or ordnance impact.

The State further notes that the consequences of impact directly relate to the conservatisms claimed by PFS, as to which, the Board has invited further evidence:

For those portions of this contention that remain for litigation, so long as they are relevant to our assessment of whether the PFS has adequately considered the effects upon its proposed facility of credible accidents caused by external events, the impact of such “conservatisms,” or the lack thereof, are items that the parties may continue to pursue.

LBP-01-19, slip op. at 52, n. 14.

The testimony of Dr. Resnikoff concerning consequences of impact are within the scope of Contention Utah K and, therefore, relevant.

D. Motion to strike Dr. Resnikoff testimony as contradicting prior Board ruling.

PFS again argues that because it was granted summary disposition on its material statement that “the hazard to the PFSF from general aviation impacts is negligible,” Dr. Resnikoff has improperly testified to an impact probability for general aviation. The fact that the hazard to the PFSF may be negligible, *i.e.*, small in degree, does not address the probability of an impact occurring, and Dr. Resnikoff’s testimony does not, therefore, contradict the Board’s Order.

In its Memorandum and Order, the Board stated that the PFS material factual statements were not disputed and “[w]e thus grant the PFS motion for summary disposition

¹²PFS panel testimony; Johns testimony.

with regard to general aviation.”¹³ The three material statements of fact submitted by PFS in support of general aviation did not mention an impact probability but averred only that “the hazard to the PFSF facility from general aviation impacts is negligible,” i.e., small in degree.¹⁴ In fact, the declaration of PFS witnesses in support of summary disposition urged the calculated impact probability of 5.25 E-7 for general aviation.¹⁵ PFS, therefore, did not claim as a material fact that the impact probability was zero, but rather claimed as a material fact that the hazard from impacts (as opposed to the probability of impact) was “negligible,” an assertion that could be made consistently with both the calculated impact probability of 5.25 E-7 and the PFS witness assertions that spent fuel casks would withstand an impact from general aviation aircraft.¹⁶

The probability for an impact from general aviation is necessary in determining the cumulative impact probability. PFS has submitted prefiled witness testimony which now claims the probability of impact from general aviation is $< 1 \times 10^{-8}$ and uses that value to determine cumulative impact probability.¹⁷ If the Board had previously ruled on the impact probability for general aviation, PFS would presumably be using the value so determined rather than $< 1 \times 10^{-8}$, an estimate which PFS first used in the Revised Addendum to the

¹³LBP-01-19, 53 NRC 416 (2001), slip op. at 50.

¹⁴PFS Statement of Material Facts in support of motion for summary disposition of Utah K, at 11.

¹⁵“Accordingly, the average annual crash impact probability for general aviation is 5.25 E-7.” Id., at 23.

¹⁶“Despite the calculated impact probability, however, the crash impact hazard to the PFSF from general aviation is, as a practical matter, zero because the spent fuel storage casks would be able to withstand the crash impact of the general aviation aircraft that might be found in Skull Valley” . Id.

¹⁷PFS panel testimony, at 110.

Crash Report, July 20, 2001, two months after the Board's Memorandum and Order on summary disposition.¹⁸

Like PFS, the State's prefiled witness testimony contains a calculated probability of impact for general aviation used to determine cumulative impact probability. More specifically, State witness, Dr. Resnikoff, has used the probability of impact for general aviation claimed by PFS in its Crash Report, 2.36×10^{-7} .¹⁹

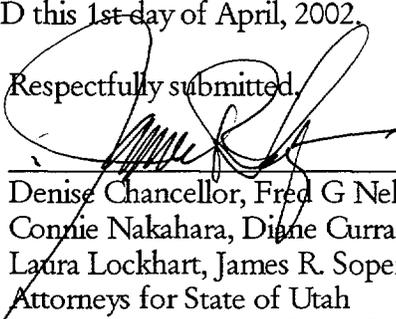
The motion to strike Dr. Resnikoff's testimony regarding the probability of impact from a general aviation crash should, accordingly, be denied.

CONCLUSION

For the foregoing reasons, the State of Utah respectfully requests that the Board deny the Applicant's Motion to strike portions of Dr. Resnikoff's testimony.

DATED this 1st day of April, 2002.

Respectfully submitted,



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¹⁸LBP-01-19, 53 NRC 416 (2001) (entered May 31, 2001).

¹⁹Crash Report, at 87.

CERTIFICATE OF SERVICE

I hereby certify that a copy of MEMORANDUM IN OPPOSITION TO APPLICANT'S MOTION TO STRIKE PORTIONS OF STATE OF UTAH'S PREFILED TESTIMONY OF DR. MARVIN RESNIK OFF REGARDING UTAH CONTENTION K/ CONFEDERATED TRIBES CONTENTION B was served on the persons listed below by electronic mail (unless otherwise noted) with conforming copies by United States mail first class, this 1st day of April, 2002:

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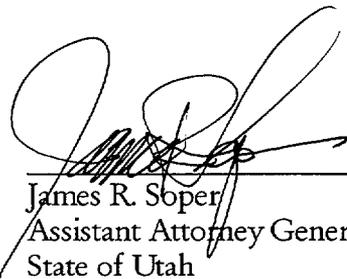
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