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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

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

July 23, 2001

**STATE OF UTAH'S REPLY BRIEF TO THE APPLICANT'S AND STAFF'S
BRIEFS ON THE QUESTION CERTIFIED IN LBP-01-19: THE
REGULATORY STANDARD FOR AIRCRAFT CRASH HAZARDS AT
THE PFS SITE - CONTENTION UTAH K (CREDIBLE ACCIDENTS)**

Pursuant to the Commission's order, CLI-01-15, the State of Utah hereby files its Reply to the Applicant's and NRC Staff's July 13, 2001, briefs on the question of whether the appropriate probability standard for aircraft crash incidents at the PFS independent spent fuel storage installation ("ISFSI") site should be 10^{-7} or 10^{-6} per year. Filed concurrently is the State's opposition to Nuclear Energy Institute's ("NEI") brief concerning the regulatory standard for aircraft crash hazards at the PFS site.¹

I. A 10^{-7} Standard is Applicable Because PFS's Aircraft Crash Risk Calculation is Not Conservative.

The Staff argues that the less protective 10^{-6} aircraft crash hazard standard is applicable because NUREG-0800, "§ 2.2.3 recognizes that accuracy is sometimes lacking in the information used to estimate probabilities . . . and it therefore allows an acceptance criterion of 10^{-6} , if reasonable qualitative arguments establish that the actual probability

¹ The question placed before the Commission arises only because the Applicant fails to meet the accepted standard in NUREG-0800 of 10^{-7} per year, developed specifically for risks due to aircraft crashes, and the Applicant, the Staff, and now NEI, subsequently argue for a less protective standard.

would be lower.” Staff Brief at 10 (*citing* NUREG-0800 § 2.2.3). The Staff relies on a number of NRC cases to support the use of the less protective standard in this case.² *Id.* at 10-12. The Staff fails to show the cases it cites contradict the position advocated by the State. The decisions in these cases either required a conservative probability estimate below the 10^{-7} per year standard or are founded on case-specific circumstances not present here, which ultimately resulted in a substantial margin of safety that would allow acceptance of the less protective 10^{-6} standard.

First, the Staff cites to Consumers Power Co. (Big Rock Point Nuclear Power Plant), LBP-84-32, 20 NRC 601 (1984), *aff’d*, ALAB-795, 21 NRC 1 (1985). The Big Rock Point Board originally started with a 10^{-7} standard and then found that 10^{-6} was an acceptable standard, “when combined with reasonable qualitative arguments” only after it reviewed site specific data presented in an adjudicatory hearing and determined that the realistic cumulative probability of aircraft crashes at the plant using conservative data was 6.1×10^{-10} per year. *Id.* at 645-647. Additionally, prior to the decision in Big Rock, the Board considered that the military flight path of concern was moved further from the plant site, thus further reducing the actual risk of an aircraft crash. *Id.* at 647. A similar decision in this case is premature inasmuch as the Board has yet to hold hearings to consider site-specific data, including the conservatism of the data (or lack thereof), or to determine the realistic

² The aircraft crash risks at the facilities in the cases cited by Staff are not comparable to those encountered by the PFS facility. For example, none of the nuclear facility addressed in the cited cases are located under an active military operating area used for low and medium altitude training in which over 5,700 single engine military fighter aircraft overfly the PFS site each year. See State Response to PFS’s Motion for Summary Disposition of Utah Contention K and Confederated Tribes B (“State Response to Second Motion”), Horstman Dec. at ¶¶ 11 and 25 (January 30, 2001).

cumulative probability of aircraft crashes. See LBP-01-19 at 54.

Next, the Staff cites Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 2), ALAB-692, 16 NRC 921, 947 (1982) for its holding that “the probability of a heavy aircraft crash into the facility, that causes a release of radioactive materials . . . was less than 1×10^{-7} , and such an event need not be included in the design basis of the facility . . .” Staff Brief at 12, n. 20. The Staff also relies on Offshore Power Systems (Manufacturing License for Floating Nuclear Power Plants), LBP-82-49, 15 NRC 1658, 1713 (1982) for its finding that a 10^{-7} aircraft crash probability standard was adequate. Additionally the Staff cites the holding in Boston Edison Co. (Pilgrim Nuclear Power Station, Unit 2), LBP-81-3, 13 NRC 103, 148-50, 208 (1981) that an aircraft crash probability of 10^{-7} was too low to be credible. Staff’s Brief at 12, n. 20. Three Mile Island (initially), Floating Nuclear (at 1713), and Pilgrim (at 148) relied on Regulatory Guide 1.70, Rev. 2 (NUREG-75/094, Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants, § 2.2.3.1). NUREG 75/094 was superseded by NUREG-0800, including the required 10^{-7} standard, as the applicable guideline developed for aircraft crashes. Three Mile Island at 923, n. 3. Rather than supporting the Staff’s position, Three Mile Island, Floating Nuclear, and Pilgrim all support the State’s position that the Commission requires the Applicant to meet the NUREG-0800 standard of 10^{-7} .

The Staff also cites Florida Power and Light Co. (St. Lucie Nuclear Power Plant, Unit No. 2) ALAB-603, 12 NRC 30, 45 (1980) and Public Service Electric and Gas Co. (Hope Creek Generating Station, Units 1 and 2), LBP-78-15, 7 NRC 642, 696-99 (1978) for the proposition that conservatively calculated probabilities of 10^{-6} are acceptable. Staff’s

Brief at 7. These two cases are not directly on point for aircraft crash hazards. The design basis standard accepted by the St. Lucie Appeal Board did not relate to aircraft crashes but to the probability of a power failure. St. Lucie at 45. Similarly, the issue considered by the Hope Creek licensing board did not concern aircraft crashes but flammable gas. See Hope Creek at 642. Both decisions occurred prior to the Commission establishing the NUREG-0800 aircraft crash standard in July 1981. In establishing an appropriate standard, the Appeal Board in St. Lucie relied up the NUREG 75/087, Standard Review Plan for Nuclear Power Plants. St. Lucie at 45 and n. 53. NUREG 75/087 was superceded by NUREG-0800, including the 10^{-7} standard for aircraft crashes. See Three Mile Island, at 923, n. 3. Additionally, in making their findings, both the St. Lucie and the Hope Creek Boards relied on the “conservatism” of the calculations. Moreover, the Commission’s *sua sponte* review of the St. Lucie decision held that the probability threshold adopted by the St. Lucie Board was a site-specific threshold and not a “generic numerical threshold to be used for future consideration of accident sequences.”³ Florida Power & Light Co., (St. Lucie Nuclear Power Plant, Unit No. 2), CLI-81-12, 13 NRC 838, 843 (June 1981).

In the PFS case, the Board did not find the Applicant’s calculations were conservative and ordered the aircraft crash calculations subject to further proceedings. LBP-01-19 at 52, n. 14. Although the State still urges the Commission to find that the 10^{-7} standard is the relevant standard in this case, if the Commission finds the less protective

³Note, the Commission in St. Lucie, also stated that “the pendency of the safety goal matter should not inhibit the boards from examining closely any accident sequence which in their judgment poses an unacceptable risk to the public health and safety.” St. Lucie, 13 NRC at 843.

standard of 10^{-6} is a viable option, then the aircraft crash probability standard is premature. See State Brief at 10-12 (*contending* that summary disposition was in error because relevant material facts are in dispute).

The Staff also relies on Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 & 2), LBP-81-24, 14 NRC 175, 219 (1981) because the Perry Board rejected a contention on the grounds that the intervenor failed to allege facts that would result in exceeding a 10^{-6} probability of an aircraft crash. Staff Brief at 12, n. 20. However, the Board in Perry did not consider whether a 10^{-6} standard was protective. Perry at 219. The Perry Board accepted the Staff's 10^{-6} standard and did not rule on its merits because the intervenor failed to challenge the standard in its contention. Id. Thus, the ruling in Perry does not support granting the less protective 10^{-6} standard.

In sum, the cases cited by the Staff do not support finding the less protective 10^{-6} per year standard, at least at this time. Furthermore, as the Staff notes, locations which fail to satisfy the NUREG-0800, § 3.5.1.6 screening criteria must conduct a site-specific assessment. Staff at 12, n. 21 (citing NUREG-0800 § 3.5.1.6). The aircraft crash probability is presumed below 10^{-7} if the screening criteria are satisfied. NUREG-0800 at 3.5.1.6-2. PFS cannot satisfy the screening criteria and must conduct a site-specific detailed analysis. See Staff Brief at 12, n. 21. The Board denied summary disposition on significant portions of PFS's site-specific detailed aircraft crash analysis, subject to an upcoming hearing.⁴ LBP-01-

⁴ The Board denied summary disposition with respect to "F-16s transiting Skull Valley, including jettisoned ordnance," air-to-air combat training on the UTTR, aircraft flying on IR-420 to Michael Army Airfield, and the cumulative hazard from aircraft and ordnance. LBP-01-19 at 54.

at 54. Hence, whether PFS's realistic probability is in fact below 10^{-7} has yet to be determined. See, State Brief at 10-12 urging the Commission, in the alternative to a finding that 10^{-7} is the appropriate standard, to find as premature whether a 10^{-6} standard is applicable at the PFS site.

II. The Part 60 Generic Design Basis Standard is Not Applicable Because in Developing the Standard the Commission Did Not Consider Aircraft Crash Hazards Comparable to Those Potentially Incurred at the PFS Site.

According to PFS, the Commission assessed site-specific risks at Yucca Mountain to provide a "perspective" on the 10^{-6} risk standard. PFS Brief at 10. Additionally, PFS emphasizes that the Commission stated that "variations in repository design [from the Yucca Mountain conceptual designs] or site selection would not likely vary these estimates by more than an order of magnitude [over the Department of Energy ("DOE") dose estimates]." *Id.* (quoting 61 Fed. Reg. at 64,266). Regardless of whether the Commission refers to the DOE risk assessment to show that the site-specific analysis for Yucca Mountain is below the prescribed design basis standard or to give perspective on the Part 60 standard, the ultimate result is the same. The Commission documents its support for the Part 60 standard. In this case, beyond the Commission's passing statements that a MRS and operating facilities at repositories are "comparable," PFS provides no technical support that a 10^{-6} standard design basis standard for the PFS site will adequately protect the public.

Also, whether the Part 60 standard was developed as a generic standard for operating facilities at repositories or as a site-specific standard for Yucca Mountain is irrelevant. Notably, Yucca Mountain is regulated under Part 60, not Part 72. In addition, Yucca Mountain is currently the only candidate repository site. In the event subsequent repository

sites are identified and evaluated, the Commission can re-evaluate the design basis standard currently established in Part 60 to ensure that the other repository designs and sites are encompassed in the standard. In the instant case, the public relies on the Commission to set a protective aircraft crash standard that will bound the site-specific events at the PFS site with an adequate margin of safety. Neither the Applicant nor the Staff has provided site-specific documentation to show that the 10^{-6} standard will in fact bound the aircraft crash hazard at the PFS site.⁵ As a matter of safety, the State urges the Commission to rely on the 10^{-7} standard developed specifically for aircraft crashes.

PFS further contends “the potential events that could occur at a repository surface facility – and that the Commission considered in promulgating the [Part 60] rule -- are no different than those that could occur at the PFS [facility].” PFS Brief at 9-10. As support for this statement, PFS cites to number of DOE documents, the most recent of which is *Crash Hit Frequency Analysis of Aircraft Overflights of the Nevada Test Site (NTS) and the Device Assembly Facility (DAF)*, C.Y. Kimura, D.L. Sanzo, M. Sharirli, December 16, 1998 (hereinafter “Kimura et al”). See PFS Brief at 11.

PFS is incorrect in its reliance on Kimura et al. First, PFS did not raise this issue below and raises it for the first time on appeal. See e.g., In the Matter of Advanced Medical Systems, Inc. (One Factory Row, Geneva, Ohio 44041), CLI-94-6, 39 N.R.C. 285, 302, n. 22 (1994), *aff’d* Advanced Medical Systems, Inc. v. NRC, 61 F.3d 903 (6th Cir. 1995) (table);

⁵ In addition, because the PFS facility is the only ISFSI not located in the proximity of another nuclear facility (e.g., the GE Morris facility is located adjacent to the Dresden nuclear reactor), the public will not have the reassurance that the area was evaluated for aircraft crash hazards under a more protective nuclear facility standard. See State Brief at 8.

Sequoyah Fuels Corp. (Gore, Okla. Site), CLI-97-13, 46 NRC 195, 221 (1997).

Second, although the Commission may have considered the potential for aircraft crashes when it established the Part 60 standard for repositories, PFS has not shown that the cited aircraft crash analyses, the Part 60 generic standard or the Yucca Mountain Standard will protect the public at the proposed PFS location. For example, the surface facilities at Yucca Mountain will be located beneath restricted airspace exclusively controlled by the repository operator - the Department of Energy.⁶ The airspace over the PFS facility is not restricted but designated as a military operating area ("MOA"), the Sevier B MOA. Moreover, PFS will not control the airspace. Most importantly, unlike at the PFS site, military overflight at the Nevada Test Site is prohibited at all times when special nuclear material is present. Kimura et al. at 20. When special nuclear material is not onsite, military aircraft may conduct medium or high altitude overflights at the Nevada Test Site.⁷ Id. at 7. Except for human error in successfully communicating the overflight prohibition when special nuclear materials are present at the Nevada Test Site, the aircraft crash risk is zero. Id. at 20. To account for human error, the potential risk that military overflight is not in fact eliminated when special nuclear material is present at the Nevada Test Site, the aircraft crash

⁶ Kimura et al at 1.

⁷ However, DOE still prohibits MOA maneuvers over the Nevada Test Site. Kimura et al. at 4. Conversely, the military conducts MOA maneuvers and low to medium altitude training in the Sevier B MOA over the proposed PFS site. See, State Response to Second Motion, Horstman Dec. at ¶¶ 11, 15.

frequency, assuming 728 overflights per year, conservatively calculated 3×10^{-88} and 3×10^{-99} crashes per year.¹⁰ Accounting for an enormous human error that would allow 728 overflights, the estimated conservative aircraft crash frequencies for Yucca Mountain are almost two and three magnitudes lower than the generic design basis standard established in Part 60.

Third, PFS has not demonstrated that the aircraft crash events at Yucca Mountain will bound those at the PFS site. The design and operations at Yucca Mountain provide additional protections not contemplated at PFS (e.g., spent nuclear fuel will be stored in shipping containers inside a building with three to five foot walls which is not penetrable by a small military aircraft.¹¹ Hence, the public is assured that a radiologic release due to an aircraft crash at Yucca Mountain is unlikely.

The Staff's position is similar to PFS's position. The Staff concludes that a 10^{-6} standard is appropriate for the PFS facility because it "would not remove spent fuel from a canister"; thus, it "presents less risk" than a monitored retrievable storage ("MRS") facility or a geologic repository operations area ("GROA"). Staff Brief at 9. The Staff's point is irrelevant. As described above, the risk of an aircraft crash in the presence of spent nuclear

⁸ Id. at 18.

⁹ Aircraft crash frequency calculated in the Safety Analysis Report. Kimura et al at 18 (*citing Final Safety Analysis Report for the Device Assembly Facility at the Nevada Test Site*, MHL Chew Associates, DAF SAR-001-193-5394C (March 1995)).

¹⁰ Because of the uncertainty in the number of aircraft which could overfly the Nevada Test Site in the absence of any special nuclear material prohibition, aircraft crash frequencies were calculated for a broad range of aircraft (728 to 75,000). Id. at 18-20. Notwithstanding the range of calculations, it is wholly unreasonable to assume that human error would allow 75,000 aircraft to fly over the site.

¹¹ State Response to Second Motion, Resnikoff Dec. at ¶ 14.

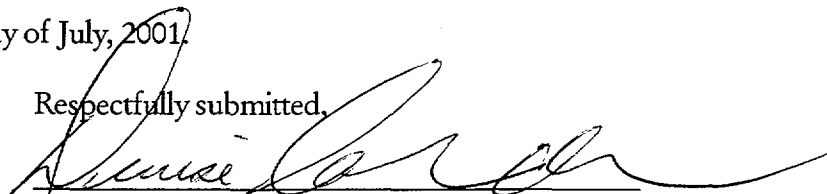
fuel (special nuclear material) at Yucca Mountain is essentially zero, and at Yucca Mountain an aircraft cannot penetrate the waste handling building where spent nuclear fuel is removed from the canister. Furthermore, there are no MRS facilities in existence and none are contemplated at any time in the future. Therefore, the comparison between operations at Yucca Mountain or at a hypothetical MRS is misplaced and the fact that PFS will not remove spent nuclear fuel from a canister does not reduce the risk from an aircraft crash hazard when compared to a MRS or GROA.

CONCLUSION

For the foregoing reasons, the State urges the Commission to reverse the Board's findings and find the appropriate risk standard for aircraft crashes at the PFS site is 10^{-7} . In the alternative, the State requests the Commission to find that a decision on a protective aircraft crash risk standard is not ripe, that relevant material facts remain in dispute, and thus, reverse the Board's grant of summary disposition, and remand the issue to the Board for consideration in an adjudicatory hearing.

DATED this 23rd day of July, 2001.

Respectfully submitted,



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CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S REPLY BRIEF TO THE APPLICANT'S AND STAFF'S BRIEFS ON THE QUESTION CERTIFIED IN LBP-01-19: THE REGULATORY STANDARD FOR AIRCRAFT CRASH HAZARDS AT THE PFS SITE - CONTENTION UTAH K (CREDIBLE ACCIDENTS)) was served on the persons listed below by electronic mail (unless otherwise noted) with conforming copies by United States mail first class, this 23rd day of July, 2001:

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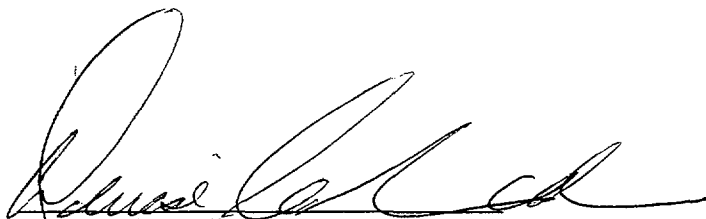
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