

ORAL ARGUMENT SCHEDULED FOR APRIL 24, 2007

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Nos. 05-1419, 05-1420, and 06-1087

OHNGO GAUDADEH DEVIA, and
STATE OF UTAH,
Petitioners,

v.

U.S. NUCLEAR REGULATORY COMMISSION
and the UNITED STATES OF AMERICA,
Respondents.

ON PETITIONS TO REVIEW ORDERS OF AND LICENSE ISSUED BY THE
U.S. NUCLEAR REGULATORY COMMISSION

FINAL REPLY BRIEF FOR PETITIONER STATE OF UTAH

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* - Authorities on which we chiefly rely are marked with asterisks.

This case is about public safety and health, and about uncertainty. To license PFS to place 4000 ten-ton casks of deadly nuclear waste above ground, under heavily traveled military flight paths, NRC had to decide how to assess various uncertainties, ranging from inputs for its quantitative assessment of the risk of radiation release, to uncertainties about DOE's operational plans for the permanent repository at Yucca Mountain, to uncertainties about terrorism. Defense in depth, a form of conservatism, is the philosophy that *should* have guided NRC in accounting for uncertainty. The defense-in-depth philosophy "requires . . . substantial safety margins." *Firstenergy*, 58 N.R.C. 151, 160 (2003). As NRC itself stated in NUREG-0800: "The defense-in-depth philosophy has been and continues to be an effective way to account for uncertainties in equipment and human performance. In some cases, risk analysis can help quantify the range of uncertainty; however, there will likely remain areas of large uncertainty or areas not covered by the risk analysis. . . . [A]ppropriate traditional defense-in-depth considerations should also be used to account for uncertainties." NUREG-0800 Ch. 19, § III.2.1.1 (JA1690). NUREG-0800 "involves the selection of conservative input values" to ensure public safety. JA372.

Utah's opening brief documented NRC's many departures from a philosophy of conservatism in the face of uncertainty. To call NRC to account for those uncertainties is not to take a convenient litigating position, nor is it to push conservatism

for conservatism's sake. It is to demand that NRC adhere to its own stated regulatory philosophy, and protect public health and safety. NRC has not done so.

SUMMARY OF ARGUMENT

When NRC decided how likely an event must be to be "credible," it purported to compare the *consequences* of an accident at an ISFSI to those at two other types of nuclear facilities: reactors (where an event is credible if its probability is approximately 1×10^{-7}) and the planned GROA at Yucca Mountain (where an event is credible if its probability is approximately 1×10^{-6}). The only evidence of the radiological effects showed the ISFSI would have much higher radiation levels than the GROA. Nevertheless, NRC reached the conclusion ISFSIs are more like the GROA than reactors based on an incomplete comparison of the different facilities. But the ISFSI would have more radiation than the GROA, and physical features at the GROA – namely a massive wall enclosing the cask systems – would reduce the consequences of an accident substantially below those of an outdoor ISFSI. As a result, the record does not support NRC's conclusion that GROAs are comparable to ISFSIs.

NRC also overlooked whether damage to the overpack surrounding the canister would cause loss of shielding and allow radiation to be released through the slim

canister walls. It was non-conservative, and contrary to the applicable regulations, *see* 10 C.F.R. § 72.106(b), for NRC to ignore this risk.

The Licensing Board concluded, repeatedly, that the probability of canister penetration was a “close” call. NRC’s guideline states an event is credible if its probability is “approximately” or “about” 10^{-6} . NUREG-0800 §§ 2.2.3-3 (JA1009), 3.5.1.6-2 to -3 (JA1019-20). NRC did not specify how proximate a calculated probability must be to 1×10^{-6} to be credible. It was arbitrary for NRC not to apply any reasoned approach (such as an order-of-magnitude approach, as suggested by one of NRC’s Commissioners in dissent).

NRC omitted from its calculations the probability that a cruise missile would crash into the facility. The probability of a missile strike may not have been credible on its own, but it was high enough that it could have brought the cumulative calculated probability higher than “approximately” 10^{-6} . Omitting this component of the cumulative probability was error.

NRC also acted non-conservatively by rejecting the Department of Energy’s Standard for evaluating the effects of plane crashes. NRC held the Standard inapplicable to measuring the effects of plane crashes on canisters, even though DOE had used the Standard to evaluate the same scenario. NRC instead relied on PFS’s non-conservative “coupon test,” which posited that steel can withstand approximately

36 times more strain than the DOE Standard allows. *Compare* NRC Br. 20 (observing that DOE Standard assumes steel can withstand 2.5% strain) *with* NRC Br. 19 (PFS advocated, and Board assumed, 90% strain).

NRC did not evaluate important components of the environmental effects of PFS's plan. Even though NRC now admits DOE's current policies suggest it will not accept PFS's canisters, the Commission dismissed the possibility – which its own Licensing Board viewed as deserving further analysis – that DOE's refusal to accept PFS's canisters will lead to a dysfunctional nuclear waste policy.

Finally, NRC did not assess the consequences of a terrorist attack. The agency's explanation for doing so – a “proximate cause” theory – was not the basis for its decision, and is wrong on the merits.

Even if the Court accepts NRC's arguments that it acted conservatively on various peripheral issues, NRC cites no instance in the seven points discussed above in which it even assessed whether or concluded that its methods and results were conservative. This approach conflicts with NUREG-0800's commitment to defense in depth and conservative input values. JA372.

The Court should not defer to NRC on these issues. NRC did not address the underlying problems in a meaningful way or evaluate whether its inputs and analysis

were appropriately conservative. The case should be remanded for NRC to evaluate these issues to ensure the protection of public safety.

ARGUMENT

I. A RADIATION RELEASE FROM AN AIRCRASH IS CREDIBLE.

A. NRC Erred in Setting the Standard Because Unrebutted Evidence Showed That the Consequences of an Accident at an ISFSI Would Greatly Exceed Those at the GROA.

NRC had to decide initially *how* conservative to be in protecting against accidents. NRC set the credible-accident threshold at 1×10^{-6} (the standard for the Yucca Mountain GROA), rather than 1×10^{-7} (the standard for nuclear reactors) or an in-between standard. Utah challenges that decision (Br. 18-22). NRC claims, inaccurately, that it “examine[d] the risks associated with” the GROA and reactors to see “which is most comparable to the proposed ISFSI.” JA230. Accidents at reactors would typically generate more radiation than those at ISFSIs. But the problem has another half: Even if reactors are more dangerous than ISFSIs, it is invalid to surmise that ISFSIs are comparable to the GROA.

There was no empirical evidence before NRC to suggest the radiation levels for ISFSIs and the GROA were the same.¹ The only empirical evidence before NRC

¹ NRC’s brief asserts that “radiological consequences of an accident at a GROA . . . would be similar to those at an ISFSI,” NRC Br. 65 n.22, but cites *nothing*

– which was unrebutted – showed the consequences of an accident at the GROA to be minimal compared to one at the ISFSI.

Utah’s expert, Dr. Resnikoff, measured whether radiation levels at the ISFSI would be higher than at the GROA. The results were alarming. At the GROA, DOE had estimated the radioactivity level at the boundary from an accident to be 2.1 rems. JA1299. At the PFS site, by contrast, individual consequences at the site boundary “range from 70 to 3,300 rems.” Resnikoff Decl. ¶ 72 (JA1316).

NRC concedes that Resnikoff’s declaration, *if true*, would show that the consequences of an ISFSI accident are greater than at a GROA. NRC Br. 59-60. That concession is noteworthy because *PFS did not challenge the accuracy of Resnikoff’s conclusion*. JA224.² The only evidence before the Board showed that an accident at the ISFSI would be far more consequential than an accident at the GROA, which contradicts the claim that NRC looked at which facility had risks “most comparable to the proposed ISFSI.” JA230.

for that assertion. The record is bare of supporting evidence.

² PFS moved to strike Resnikoff’s testimony as irrelevant to the application of the 1×10^{-6} standard, but did not challenge his dosage calculations or conclusions. See JA1346-49. PFS essentially argued other ISFSIs might have lower dosage levels. PFS, however, submitted no testimony that Resnikoff’s calculations were unrepresentative. As the Board denied PFS’s motion to strike, JA224, Resnikoff’s testimony about radiation levels was before the Board.

Nor did the Board – NRC’s factfinder – cite any problems with Resnikoff’s methodology. It declined to consider his calculations because Resnikoff calculated radiation levels only at PFS’s ISFSI, rather than showing that his calculations applied to other ISFSIs. JA205. Had Resnikoff’s dosage testimony been given weight, the Board agreed “additional litigation would be warranted on this point.” *Id.* Instead of acquiring actual data before making such a key decision, the Board certified the issue to the Commission, in part, because “based on its current submissions PFS cannot meet this [10⁻⁷] standard relative to the cumulative hazard from aircraft accidents and jettisoned ordnance.” *Id.*

On review, the Commission implicitly recognized the Board’s error in disregarding Resnikoff’s testimony, so it ruled, *sua sponte*, that the declaration was not probative. The Commission’s explanation was buried in a footnote at the end of its decision: “[Resnikoff’s] affidavit does not explain the input assumptions used to determine the dose, nor does it discuss the physical differences between a reactor and the GROA.” JA236. The conclusion cannot be sustained.³

First, Resnikoff explained his methodology. To include just a short excerpt:

³ PFS references Resnikoff’s calculations from the separate seismic phase of the case. PFS Br. 11 n.8. NRC’s treatment of that unrelated testimony does not explain its arbitrary decision to ignore Resnikoff’s evaluation of the consequences of an accident.

Employing the computer code HOTSPOT (Homann, SG, "HOTSPOT Health Physics Codes for the PC," Lawrence Livermore National Laboratory, UCRL-MA-106315, March 1994), I calculated the downwind exposures due to a puff release from the HI-STORM cask. The program assumes a Gaussian distribution, 1mm AMAD. I further assume a deposition velocity of 1 cm/sec, a wind speed of 4 m/s and Pasquill Stability Category D meteorological conditions. These are the most likely meteorological conditions in Skull Valley.

Resnikoff ¶ 71 (JA1316). He attached to his declaration separate exhibits providing his backup data and assumptions. JA1326-35.

Second, NRC set the credibility threshold in the course of resolving PFS's summary disposition motion; inferences should have been drawn in favor of the non-movant, Utah. To assume Resnikoff's unrebutted factual assertions were false, on a summary disposition motion, was error.

Third, contrary to the Commission's claims, Resnikoff *did* describe the physical differences between the GROA and ISFSI. Notably, the GROA (but not PFS's ISFSI) provides multiple levels of radiation shielding, including storage of SNF in a building with 5-foot-thick concrete walls. Resnikoff ¶ 14 (JA1298). NRC

has never addressed this evidence.⁴ It claims, incomprehensibly, that this massive barrier will not reduce the consequences of an accident. NRC Br. 60 & n.19.⁵

Thus, the uncontradicted evidence showed that ISFSIs create a radiological risk somewhere in between reactors and the GROA. In the face of uncertainty, NRC rushed to the conclusion that the consequences of accidents at ISFSIs are closer to those at the GROA than at reactors. Commissioner Dicus was correct, in dissent, to call for a “factual determination whether the consequences of a potential accident at an ISFSI are more similar to those of an accident at a GROA.” JA233.

⁴ NRC summarily concludes all of the items Utah has raised relate to the probability of an accident, not its effects. NRC Br. 60 n.19. But, on their face, they relate to effects – a crash into a walled facility will have less radiation consequence than a crash into an open-air facility, a difference in containers will affect how much an accident will damage a cask system (and thus how much shielding will be lost), and a decrease in military readiness would not affect probability but be an outcome of a crash.

⁵ PFS’s effort to refute this evidence – that SNF arriving at the GROA would *temporarily* reside outside the walls (until it was moved inside), PFS Br. 10 n.7 – is a new argument without record support.

B. Everyone Acknowledged That an Accident Will Damage or Destroy the Overpack, But NRC Refused to Assess the Consequences.

Under 10 C.F.R. § 72.106(b), an ISFSI *cannot be licensed* if a “design basis accident” (*i.e.*, one NRC deems “credible”) will cause some radiation to escape the “boundary.” Yet on purely procedural grounds, NRC refused to consider one of the ways radiation can escape from a cask after an air crash – through overpack damage – which everyone agrees would occur. Such a refusal is inconsistent with NRC’s defense-in-depth philosophy that is supposed to guide it toward a conservative approach to uncertainties affecting public health and safety. And NRC’s procedural arguments are wrong.

NRC criticizes Utah for citing (dozens of) “snippets” to show that loss of shielding was part of the second hearing. NRC Br. 69. But NRC cannot refute that it led Utah to conclude (reasonably) that overpack-only damage was within the ambit of the hearing. NRC suggests instead that there was some sort of gestalt understanding that when it referred to “cask penetration” it actually meant “canister perforation,” even though *cask* is not the same as *canister* and *penetration* is not the same as *perforation*. See Utah Br. 30-31. It proclaims that when Utah’s numerous citations are assessed against “the record as a whole” they “do not support Utah’s position.” NRC Br. 69. But NRC cites no instance in which it clarified the scope of

the hearing, nor does it respond to case law requiring it to do so. Utah Br. 28-29; *Public Service Comm'n v. FERC*, 397 F.3d 1004, 1012 (D.C. Cir. 2005) (agency must provide parties “with adequate notice of the issues that would be considered, and ultimately resolved, at that hearing”).

NRC would have the Court believe Utah’s position is an afterthought. NRC Br. 66. To the contrary, in 2003, Utah submitted expert reports on radiation consequences, but the Board later narrowed the scope of the hearing to exclude dose consequences and prevented Utah from introducing its evidence. *See* JA717-20; JA1627. In any event, it was not Utah’s burden to show a release would occur; the burden was on PFS to show that an accident would *not* release radiation. 10 C.F.R. § 72.106(b). Thus, the only thing the Board *permitted* Utah to show at the hearing was that overpack damage would occur, which Utah proved.

When the Board asked what Utah would show if there was an additional hearing, Utah made clear its wish to present evidence that overpack damage would release radiation. NRC does not try to respond to Utah’s proffer; Utah Br. 24, in which Utah reiterated that consequences arose because “there is a greater than one in a million probability that there will be a breach of . . . *the overpack*, the canister, or the fuel cladding.” JA3592 (emphasis added). It added, “*no credible crash may:*

*Breach any confinement system.” Id. (emphasis added).*⁶ Also, Utah’s requested post-hearing findings further reflect its concern with overpack rupture: Utah argued, “If no perforation [of the canister] is predicted” *the Board must still “evaluate whether a release [of radiation] will occur.”* See JA3624 (emphasis added). In many other places, Utah reminded the Board of its concern that the overpack would rupture. JA3625 (arguing that accident showed “full penetration of the overpack outer shell”); JA3629 (“none of the scenarios analyzed show that the overpack . . . is safe from rupture”); JA3644 (criticizing NRC Staff for being “*not concerned whether the overpack outer shell tears or ruptures*”) (original emphasis). Utah also argued that the record left open the possibility that an F16 crash would “result in a breach of the overpack shell” and therefore “result in increases in radiation dose.” JA3712. Utah’s requested findings show that it informed the Board that it worried about loss of shielding.

NRC argues it would be unfair to require PFS to prepare for a supplemental hearing about the radiological consequences of overpack damage. NRC Br. 68. Yet, even now, PFS *admits* that the overpack was a “sacrificial lamb” that would be

⁶ PFS suggested that Utah’s offer of proof was concerned only with excessive doses arising from *canister* “breach.” PFS Br. 13 n.14. PFS overlooks that Utah specified that it was concerned with the “potential for breach of *any confinement system.*” JA3593 (emphasis added).

seriously damaged or destroyed in the event of an accident. PFS Br.14 n.15. Everyone agrees that an accident will cause loss of shielding; the question is whether that loss will release enough radiation to cause a boundary event, which NRC has not yet evaluated. As a result, *none* of the hearing's findings would need to be disturbed. A new, non-duplicative hearing could assess the unresolved issue whether overpack failure would release impermissible levels of radiation – the central safety question of whether radiation will escape the ISFSI and reach Utah's citizens. *See* 10 C.F.R. § 72.106(b).

PFS (but not NRC) claims that Utah referred to a release of “radioactive *material*.” PFS Br. 12. It reasons that, because *material* can be released only if perforation occurs, Utah must have been concerned only with canister perforation. Radiological material, of course, would escape in the event of canister perforation. This was the scenario that most (but not exclusively) concerned Utah. But PFS timidly concedes that the Board and Utah both referred elsewhere to “radiological release” (rather than release of radioactive *material*). PFS Br. 13. To evade this obvious problem, PFS feigns that a radiological “release” can occur only if the canister is perforated. *Id.* The Board's own statements belie PFS's dubious claim. *See* JA384 (“an applicant must show that if a credible accident were to occur, the consequences would not result in the *release of radioactivity* [rather than ‘radioactive

material'] that would cause *doses* in excess of' applicable regulations) (emphasis added).

Finally, NRC suggests it has already concluded that losing shielding would not release radiation. NRC did conclude there would be no release if an earthquake knocked over cask systems. NRC Br. 70 & n.26. But this comparison is misleading. The base of a tipped-over cask system would have approximately 9.5" of steel *and* 17" of concrete to block radiation. See JA1615. A canister is only ½" thick. The two scenarios are dissimilar.

C. NRC's Brief Helps Prove That It Applied The Credibility Test Arbitrarily.

NRC does not define *exact* probability thresholds. Rather, NUREG-0800 sets the threshold as "*approximately* 10^{-7} " and "*less than about* 10^{-7} ." See Utah Br. 33. Because of NRC's determination that ISFSIs are more like a GROA than like reactors, the relevant threshold is *approximately* 10^{-6} rather than *approximately* 10^{-7} , but it is still approximate. The questions then arise: (1) Is a number *close to* 1×10^{-6} a failing or a passing number; and (2) how close must the calculated probability be to *approximate* 10^{-6} ?

In this case, Utah contends the Board-calculated probability of canister perforation – 0.86×10^{-6} or, as NRC and PFS would have it, 0.74×10^{-6} – is approxi-

mately 1×10^{-6} , and NRC and PFS contend it is not. Yet NRC and PFS offer *nothing but assertion* to suggest that 0.99 would be close to 1, but that 0.86 and 0.74 are not. This pure arbitrariness creates uncertainty whether an accident's probability is about 10^{-6} .

There are non-arbitrary ways to decide whether one number is or is not close to another number, but none of them appears in NRC's or PFS's briefs or the decisions below. One non-arbitrary technique, for example, is to round to the nearest order of magnitude. NRC and PFS resist that technique, because the PFS project would *fail* under that approach.

Amicus curiae Nevada argued persuasively that the order-of-magnitude approach makes sense given the impossibility of calculating probabilities exactly. Nevada Br. 9. And even NRC admits that “[n]o one, least of all NRC, contended that ‘pinpoint estimates’ of the F16 crash probability were either possible or necessary.” NRC Br. 75 n.29. But NRC rejects the order-of-magnitude approach, too. NRC Br. 74.

By applying *no* discernible standard, NRC's policy is arbitrary. NRC's brief argues that 0.737×10^{-6} is not “even particularly close” to 1×10^{-6} . *Id.* at 71. NRC's litigation posture, however, clashes with its factual finding that the calculated probability is “only slightly less than one in a million.” JA787. The Board also found that

“the F-16 accidental crash challenge presents a close case.” JA791; *see also* JA796 (“outcome is a close one”); JA771 (“probability was close to the designated threshold”).

Rather than defend its own standardless approach, NRC claims Utah previously disputed that an order-of-magnitude approach should apply. NRC Br. 73-74. That argument is misleading. After the first hearing, the Board found a 4.29×10^{-6} chance of an aircrash. PFS argued that the order-of-magnitude approach would allow NRC to round down 4.29×10^{-6} and conclude that an accident was not credible. Utah disagreed: Even if 4.29×10^{-6} were erroneously and non-conservatively rounded to 1×10^{-6} ,^{FN7} that number *is* deemed credible. Utah therefore rejected PFS’s order-of-magnitude approach. It is very different, however, to round up. Differentiating the two is not a litigation tactic, as NRC suggests, NRC Br. 74, but logic: according to NUREG-0800, an event *is* credible if its probability is approximately 1×10^{-6} .

⁷ Orders of magnitude are measured on logarithmic scales. G. Langkamp & J. Hill, *Quantitative Reasoning and the Environment* 15-16 (2006); http://www.vendian.org/envelope/TemporaryURL/what_is_oom.html (explaining that, because of logarithmic scales, “a number’s order of magnitude is just whatever power of ten is closest. Numbers smaller than 3.162 [*i.e.*, the square root of 10] are closer to 1, and bigger than that, to 10.”). Thus, the 4.29×10^{-6} calculated probability of an aircrash would be rounded *up* to 1×10^{-5} .

D. NRC Offers No Defense of Its Failure to Quantify the Probability of a Cruise Missile Crash.

NRC and PFS say nothing meaningful to preclude a remand for quantification of the probability of a cruise missile strike. To say (accurately or inaccurately) that the probability is “essentially zero” (NRC Br. 80) – a phrase that does not appear in the decisions below – does not differentiate it from the other one-in-a-million-or-less scenarios NRC *did* quantify, especially when a very small probability increase would bring the calculated probability above 1×10^{-6} .

NRC notes that the flight path “will not be ‘any closer than 10 nautical miles from the facility’” and that no cruise missile had “crashed more than one mile from its planned flight path.” NRC Br. 80. The first point is irrelevant because a missile could veer off course, as cruise missiles have done regularly. *See* JA1266 (admitting 16% of cruise missile tests crash off-target). The second point improperly looks at the fairly small data set of missiles that have actually crashed rather than extrapolating to calculate what *could* happen.

NRC might reject Utah’s calculations, but it is not free to disregard the possibility of a missile strike. This is the scenario NUREG-0800 anticipated: “Individually each [component of the cumulative risk] may be judged acceptably low; the

aggregate probability may be judged sufficiently great that additional design features are warranted.” JA1010.

E. NRC Should Have Applied DOE’s Standard.

NRC might have been free to conclude that the DOE Standard was *inadvisable* and adopt a different approach. But it deserves no deference for reaching the incorrect conclusion that the Standard was *inapplicable*. DOE – the creator of the standard – applied the Standard to an almost identical situation. *See* Utah Br. 38-42.

NRC now retreats from its previous reasoning. It suggests, falsely, that it weighed the *merits* of PFS’s “coupon-strip” test against the DOE Standard and decided that the former was better. The Court should not consider this revisionist explanation. “We do not ordinarily consider agency reasoning that ‘appears nowhere in the [agency’s] order.’” *PanAmSat Corp. v. FCC*, 198 F.3d 890, 897 (D.C. Cir. 1999).

In support of its claim that the coupon test was “preferable,” NRC cites vaguely to a nine-page chunk of the Board’s decision, *see* NRC Br. 77-78 (citing JA3888-96). But nowhere in those pages did the Board say the coupon test is preferable to the DOE Standard. After noting that Utah’s proposal to use the DOE Standard “on its face appears meritorious,” JA3891, NRC nevertheless rejected Utah’s argument for three reasons. First, “the standard set forth [in the DOE Standard] is inapplicable, by

its own terms, to ‘pressure vessels,’” which, according to PFS, included the canister. *Id.* Second, “the DOE standard was developed with a clear focus upon ‘structural’ members, which are made of carbon steel, not stainless steel.” *Id.* And third, “the DOE Standard was intended to be used . . . to assess whether or not a particular structural member would fail.” *Id.* Each of those arguments is based on whether the DOE Standard applied to canisters.⁸ NRC therefore concluded that the problem was beyond the scope of the DOE Standard, which it held was “unrelated to determination of the failure of a steel component by tensile rupture, which is at issue here.” JA3892.

As Utah’s opening brief explained, that conclusion was erroneous: DOE applied the Standard to the evaluation of an aircraft crash into a concrete and steel cask

⁸ PFS emphasizes that it *submitted* to NRC methods of calculating strain other than the slow one-directional pulling apart of pristine strips of metal a few inches long (the coupon test). Whatever PFS submitted, NRC *relied* exclusively on the coupon test. See PFS Br. 17 & n.19 (citing party submissions, rather than Board decisions, for proposition that various data “were presented” to the Board). But even NRC recognized the many flaws in the coupon test, including that the steel samples were “measured in quasi-static laboratory conditions . . . on samples which have not been subjected to the variations which might be expected to occur in the manufacturing, construction and assembly process.” JA3890.

system – the situation that was before the Licensing Board.⁹ See JA1437;¹⁰ Davis Report (JA1252-57; JA1513-17). NRC cannot now recast its arguments about the Standard’s *applicability* by pretending that it weighed the *substantive merits* of each approach.

NRC suggests that Utah cannot raise this sub-argument because it did not reference the Yucca Mountain EIS below. NRC Br. 76 n.30. But NRC admits that Utah’s central argument for applying the DOE Standard was that “DOE appeared to have done so.”¹¹ NRC Br. 21. The Yucca Mountain EIS is merely further proof of

⁹ Contrary to PFS’s claim of no cask penetration, PFS Br. 16, the Davis Report concluded that an F16 crash would penetrate approximately 32.3” of concrete, JA1255 (Table), which is thicker than the concrete in PFS’s overpacks.

¹⁰ A government report such as the Yucca Mountain EIS is subject to judicial notice. *Pueblo of Sandia v. United States*, 50 F.3d 856, 861 n.6 (10th Cir. 1995). The Yucca Mountain EIS is easily authenticated and is available on an official DOE website, http://www.ocrwm.doe.gov/documents/feis_a/index.htm.

¹¹ Utah showed that the Standard, by its terms, applies to canisters. See, e.g., JA3831-36. The Standard “is applicable to all facilities containing significant quantities of radioactive . . . materials” and applies to items constructed like a canister such as “tanks” and other shell structures made from plates. JA1048; JA1057. It also applies to “structures, systems and components [SSCs]” of the target facility, JA1048; see also 10 C.F.R. § 72.3. ***PFS and NRC both concede that the canisters are SSCs (to which the DOE Standard applies).*** See, e.g., JA2031-32 (listing canister as an SSC); JA1519 (Table). Because the Standard applies to canisters, PFS cannot conclude that the only issue here is “localized failures” to which the relevant portion of the DOE Standard is inapplicable. PFS Br. 16 & n.17.

that conclusion. “Once a federal claim is properly presented, a party can make any argument in support of that claim; parties are not limited to the precise arguments they made below.” *Harris Trust & Savings Bank v. Solomon Smith Barney, Inc.*, 530 U.S. 238, 245 n.2 (2000) (citation and quotation omitted). In any event, the Yucca Mountain expert report *was* in the record, and PFS introduced it. *See* JA1513-17. Utah’s argument is properly before the Court.

NRC never even asked whether the coupon test was conservative. By contrast, the DOE Standard, “[w]hen applied as a complete approach, . . . will result in a technically justified, *conservative* analysis of the risk posed by releases resulting from aircraft crash.” JA1046 (emphasis added).

F. NRC’s Approach Was Not, on Balance, Conservative.

NRC claims that Utah advocates conservatism for conservatism’s sake. NRC Br. 82. Utah advocates conservatism for safety’s sake: Utah’s citizens will be harmed if an accident occurs. Utah cited numerous close calls in which the record was ambiguous and NRC selected the less safe input. Utah Br. 42-45. Changing even a single input could have raised the calculated probability above the credibility threshold – which shows how near the calculated probability was to “credible.” It does not matter whether an input here or there is conservative: NRC underestimated the probability of an accident by, among other factors, rejecting the DOE Standard

for PFS's "coupon test," using an arbitrary 10-year subset of F16 crash data, and using crash data from takeoffs and landings even though no takeoffs or landings occur near the ISFSI. Its approach was antithetical to NUREG-0800's thesis that "its proper use involves the selection of conservative input values," a thesis that is "fully consistent with a fundamental principle of safety assessment." JA372.

II. NRC NOW ADMITS GRAVE UNCERTAINTY ABOUT WHETHER DOE WILL ACCEPT PFS'S CANISTERS, WHICH REQUIRES NRC TO ASSESS THE CONSEQUENCES OF THE UNCERTAINTY.

To NRC's credit, its brief admits that there has been an "apparent change in DOE's current general thinking." NRC Br. 102. NRC argues, however, "it is far from clear . . . that DOE will, ultimately, refuse to allow direct shipment of canisters from PFS to a permanent repository." *Id.* That misstates Utah's argument. The point is not that DOE has clarified its plans and refused to accept PFS's canisters, but that the uncertainty in DOE's plans necessitates further analysis. Utah Br. 54-55.

NRC is content to assume that everything will work out fine: "Additional study and consideration of its standardization proposal, therefore, *could well* lead DOE to relax it and allow acceptance of multi-purpose canisters." NRC Br. 103 (emphasis added). But NRC admits DOE's current plan could cause great complications: "An outright refusal to accept multi-purpose canisters like those to be used at PFS would *greatly complicate matters at decommissioned nuclear plants* that

already store spent fuel at onsite ISFSIs but lack repackaging facilities.” *Id.* at 102 (emphasis added). Utah agrees: If DOE sticks to its apparent plan, at the least, SNF will have to take multiple additional trips across the nation. It would also have to be repackaged after being shipped back from the ISFSI to the reactor that produced it.

But even this scenario assumes that each plant can repackage its own waste, and there is no record to support that Pollyannaish view. In practice, many reactors would have to pay other reactors to repackage their waste. NRC dismissed this point as merely an economic argument. NRC Br. 105. Not so: If SNF repackaging is gridlocked because only a handful of plants can repackage waste, SNF could stay in Utah for substantially longer than authorized under PFS’s license. Additionally, a logjam in repackaging could drag out greatly the process of loading up the Yucca Mountain facility. The problem with PFS’s plan is the *uncertainty*. The risk that DOE’s refusal to accept PFS’s waste will create a dysfunctional national nuclear waste program is real enough that NRC should have evaluated the issue.

Rather than evaluate the potential problems of a dysfunctional national nuclear waste policy, NRC repeats, like a mantra, that there is a “high standard for reopening” the record. NRC Br. 41, 99, n.38; 102; 103. But the only part of the applicable burden Utah was held not to have met is identical to the summary judgment standard.

See Utah Br. 12, 46-53. NRC fails to refute Utah's slew of evidence showing that its contention satisfied that burden.

NRC represents that, if DOE will not accept PFS's canisters, that decision will merely "lead[] to additional environmental impacts that the FEIS has already effectively accounted for and analyzed." NRC Br. 103. That claim is inaccurate. NRC suggests that repackaging would occur regardless of whether PFS built its ISFSI. *Id.* at 100 n.39 & 107 n.41. But, if the ISFSI were built, reactors would package their waste once to ship to the ISFSI, and then have to repackage it when it was shipped back from the ISFSI. Conversely, if waste stayed at the reactors until DOE announced the specifications for the canisters it will accept, SNF would be packaged only once.

Likewise, NRC argues that its calculations assumed that SNF would be traveling from Maine to Utah, so that a second trip across the country (and then back west for deposit at Yucca Mountain) would have minimal impact. But this overlooks the geographic origin of PFS's waste. "The majority of fuel (over 90 percent) would arrive at the PFSF from eastern reactor sites," JA2381, so the Maine-to-Utah trip is not nearly double the length of the average trip. The trip from Maine to Utah to Nevada is not nearly the distance, for example, of traveling from Florida to Utah to Florida to Nevada. The extra distance entails extra risk, unanalyzed in the FEIS.

Also, as noted above, even this rosy scenario pretends that every plant will promptly take back its SNF and repackage it efficiently. But some reactors may have exceeded their storage capacity (and thus be unable to reclaim SNF) by the time DOE clarifies its position. Others might not have space in their spent fuel pool to repackage SNF, which could lead to long delays in repackaging. Others might have been decommissioned by the time Yucca Mountain accepts SNF, such that the waste could be orphaned in Utah. There are many scenarios, *unexamined in the FEIS*, in which DOE's policy could (in NRC's words) "greatly complicate" matters. NRC Br. 102.

To represent that it has already evaluated the troubling scenario of a nuclear waste logjam, NRC cannibalizes its own Board's findings, *id.* at 106, and virtually admits that the Board erred. *Id.* at 108 ("The Board's evidentiary analysis, however, is immaterial to this lawsuit."). NRC abandons the Board for strategic rather than safety reasons. *See* Utah Br. 55 (listing numerous admissions that risk of dysfunctional nuclear waste program would require further NEPA analysis). In 2005, the Board agreed that moving SNF "from originating reactor, cross-country to temporary storage, back cross-country to reactor (or elsewhere) to be 'recontainerized,'" would require NEPA analysis. In the Board's words, "***If NEPA requires anything, it is that alternatives be evaluated, and [the scenario that now appears likely] would seem***

to have little to commend it.” JA826 (emphasis added). But a year later, after Utah presented even stronger evidence, the Commission retreated from the Board’s admonition by pretending that DOE’s policy would not change the environmental assessment meaningfully. The only things that changed were that Utah had presented stronger evidence and NRC believed it was done with the proceedings.

Nevertheless, NRC now claims that “[a]chieving finality in this nearly decade-long proceeding,” NRC Br. 105-06, was more important than addressing the problem that its own Board previously recognized as an important NEPA issue. And, according to the Board itself, “no evidentiary record was ever developed . . . to test the Applicant’s and Staff’s assumptions about the minimal impact of cross-country transportation.” JA826.

III. NRC MUST EVALUATE THE CONSEQUENCES OF A TERRORIST ATTACK.

NRC classified thousands of pages of materials from these proceedings as “Safeguards” because terrorists could use the information to attack PFS’s facility. That fact is inconsistent with its present claim that there is a negligible risk of a terrorist attack. PFS’s ISFSI would be a one-of-a-kind facility at which a large proportion of the nation’s SNF would be stored above ground near military facilities,

presenting a uniquely inviting target for terrorists. The agency should evaluate the consequences of such an attack.

NRC does not even mention *any* of the four arguments on which it based its decision. *See* Utah Br. 57; JA331. Instead, NRC now claims its decision was based on the lack of proximate cause between licensing the ISFSI and a terrorist attack.

Reviewing courts “cannot evaluate the reasonableness of an interpretation the Commission did not set forth.” *Communications and Control, Inc. v. FCC*, 374 F.3d 1329, 1336 (D.C. Cir. 2004). NRC says (Br. 91) Utah overlooks this “core argument,” but the Board never even mentioned the concept, *see* JA238-48. And the Commission noted that *some courts* had applied a proximate cause requirement, but did not do so itself. JA331. The Commission relied on the *foreseeability* of an accident, not a proximate cause theory. *Id.*

In any event, the cases on which NRC relies are inapposite. In *Department of Transportation v. Public Citizen*, 541 U.S. 752 (2004), the Department had no power to prevent the action in question. The Court held, “where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant ‘cause’ of the effect.” *Id.* at 770. Here, NRC controls completely the decision whether to authorize PFS to store 40,000 tons of lethal radioactive waste in the middle of Utah. The opposite result occurs

when the agency has the power “to prevent the activities causing the environmental impact.” *Sierra Club v. Mainella*, 459 F. Supp. 2d 76, 104 (D.D.C. 2006); *see also id.* at 104-05 (“The holding in *Public Citizen* extends only to those situations where an agency has ‘no ability’ because of lack of ‘statutory authority’ to address the impact” or “to take actions that could lessen the environmental impacts of concern to the plaintiffs.”).

The other cases on which NRC relies are also inapplicable, as the Ninth Circuit held in *Diablo*. *See* 449 F.3d 1016. In *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766 (1983), petitioners demanded that the EIS assess the *psychological* effect of reopening Three Mile Island. *Id.* at 773. A terrorist attack has real, tangible environmental effects, as the deaths, fires, and air pollution following the September 11 attacks make horrifically clear.

In *Glass Packaging Institute v. Regan*, 737 F.2d 1083 (D.C. Cir. 1984), this Court decried the attempt to expand “environmental impact” to include “ingestion of criminally adulterated food.” *Id.* at 1091. Tampering with bottles would affect the individuals who consumed a tainted bottle, not the environment. A terrorist attack on the ISFSI, however, could cause significant harm to the environment. It could distribute radiation widely, taint water supplies, and harm nearby federal lands.

In any event, the proximate cause standard is inapplicable, because the risk of terrorism goes to the “no-action” and cost-benefit analyses in the FEIS, to which *Public Citizen*’s proximate cause test does not apply. *See, e.g., Save Our Cumberland Mountains v. Kempthorne*, 453 F.3d 334, 345-46 (6th Cir. 2006) (declining to apply *Public Citizen* to NEPA’s “no-action” assessment). Thus, even *if* there were no proximate cause between NRC’s decision and the terrorist target, the EIS would still need to evaluate terrorism in its “no-action” and cost-benefit analysis.

Also, importantly, there is no basis to conclude that the ISFSI is not a proximate cause of a terror attack.¹² Utah did not have an opportunity to build a record on this fact-specific issue and did not have the opportunity below to address this argument. The terrorism risk in Skull Valley would not exist without the ISFSI, and the proximate cause test is satisfied when there is “some direct relation” between one event and another. *Holmes v. SIPC*, 503 U.S. 258, 268 (1992); *see also Serbin v. Bora Corp.*, 96 F.3d 66, 75 (3d Cir. 1996) (“it is fundamental that there may be more than one proximate cause of an injury”).

¹² The Ninth Circuit’s reasoning in *Diablo* shows that licensing an ISFSI would proximately cause the risk of terrorism. 449 F.3d at 1029. And Utah’s case is even stronger: the Skull Valley ISFSI would be a new target, whereas the *Diablo* ISFSI would adjoin an existing reactor.

Finally, NRC's claim that it is impossible to evaluate terrorism in the EIS because a "meaningful likelihood of probability cannot be assigned" does not respond to the methodologies Utah suggested to calculate the probability of an attack on PFS's ISFSI. Utah Br. 60 (suggesting an actuarial evaluation).

IV. PFS HAS OFFERED NO MEANINGFUL ASSURANCE THAT THIS CASE IS NOT MOOT.

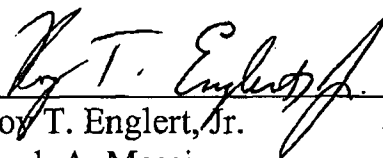
PFS cannot build its facility unless a court reverses the decisions of BLM and BIA that prohibit PFS from transporting its waste across public lands or leasing Reservation land. Only a *successful* PFS challenge to those decisions, which are entitled to substantial deference, would make this case not moot.

Only PFS knows whether it will try to challenge those five-month-old decisions. Yet PFS says only that it is "contemplating seeking judicial review of these decisions" and that a challenge is "under active consideration." PFS Br. 29. If PFS wishes this Court to review NRC's decision on the merits – rather than vacate it as moot, *see* Utah Br. 14 – it should do more than think about bringing the judicial challenge that must be brought, *and succeed*, for NRC's actions to have any effect in the real world.

CONCLUSION

The Court should reverse, remand, and/or vacate the decisions of the NRC and its Licensing Board discussed in this brief. Alternatively, NRC's challenged orders and its issuance of a license to PFS should be vacated as moot.

Respectfully submitted,



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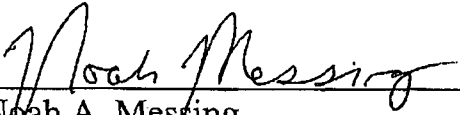
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March 15, 2007

CERTIFICATE OF COMPLIANCE

I certify that this brief complies with the type-volume limitations of Fed. R. App. P. 32(a)(7)(B): It is proportionally spaced, has a typeface of 11 points or more, and contains 6,876 words, excluding the parts of the brief exempted by Fed. R. App. P 32(a)(7)(B)(iii) and Circuit Rule 32(a)(2).

March 15, 2007



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CERTIFICATE OF SERVICE

I hereby certify that on March 15, 2007, two copies of the sealed versions of the Final Brief For Petitioner State of Utah and Final Reply Brief For Petitioner State of Utah for Case Nos. 05-1419, 05-1420 and 06-1087 were served by first class mail upon:

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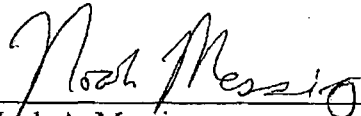
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