

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

OAK RIDGE ENVIRONMENTAL)
PEACE ALLIANCE,)
)
NUCLEAR WATCH OF NEW MEXICO,)
)
NATURAL RESOURCES DEFENSE COUNCIL,)
)
RALPH HUTCHISON,)
)
ED SULLIVAN,)
)
JACK CARL HOEFER,)
)
LINDA EWALD,)
)
)
Plaintiffs,)

Civil Case No. 1:17-cv-01446-RJL

v.)

JAMES RICHARD PERRY, SECRETARY,)
UNITED STATES DEPARTMENT OF)
ENERGY, and)
)
FRANK G. KLOTZ, ADMINISTRATOR,)
NATIONAL NUCLEAR SAFETY)
ADMINISTRATION)
)
Defendants)

**PLAINTIFF’S OPPOSITION TO DEFENDANTS’ MOTION TO TRANSFER CASE TO
THE EASTERN DISTRICT OF TENNESSEE**

INTRODUCTION

Although this case has important implications for the safety and reliability of the nation’s nuclear weapons program, it is a garden-variety action under the Administrative Procedure Act (“APA”), 5 U.S.C. § 706, in which Plaintiffs have not sought any preliminary injunctive relief, and which Plaintiffs expect to resolve on the basis of an administrative record and cross-motions

for summary judgment. Plaintiffs have challenged a decision regarding a defense nuclear facility of national importance—a decision made in Washington, D.C. by a federal agency, the National Nuclear Security Administration (“NNSA”), for failure to properly consider information that originated from other federal agencies also located in the Washington, D.C. area. Nevertheless, despite Plaintiffs’ reasonable choice to file this case in Washington, D.C., Defendants have moved to transfer this case to the Eastern District of Tennessee, misleadingly characterizing this case as a “local dispute.” However, Plaintiffs filed this case in Washington, D.C. for clear, common-sense reasons, discussed in further detail below:

1. The decision at issue was made in the District of Columbia;
2. The information that Plaintiffs allege Defendants unlawfully failed to consider originated in or near the District of Columbia;
3. The important issues raised in this litigation—i.e. issues regarding the safety of the nation’s nuclear weapons program—are issues of overriding national significance and interest, which counsels in favor of litigating these matters in the District of Columbia;
4. Claims under the APA regarding the nation’s defense nuclear facilities have been regularly litigated in the District of Columbia;
5. Defendants are located in the District of Columbia, and thus the District of Columbia is Defendants’ home forum;
6. Plaintiffs’ counsel are located in the District of Columbia, greatly reducing the non-profit Plaintiffs’ costs of litigating this case if it remains in the District of Columbia;
7. Because this is an administrative record case that will be resolved on purely legal grounds without the introduction of evidence or the need for witness testimony, there will be no

inconvenience to any witnesses or any obstacle to obtaining relevant evidence if the case is litigated in the District of Columbia;

8. This Court regularly resolves administrative record cases involving challenges under the National Environmental Policy Act (“NEPA”) and the APA, including such challenges regarding defense nuclear facilities located around the nation.

In short, Defendants cannot carry their burden to overcome the strong presumption in favor of Plaintiffs’ choice of forum because the relevant transfer factors justify hearing this case in the District of Columbia. Accordingly, Plaintiffs respectfully request that the Court deny Defendants’ transparent forum shopping in their Motion to Transfer.

BACKGROUND

Plaintiffs have challenged the adequacy of the environmental review under NEPA and the APA for a new design for the NNSA’s Uranium Production Facility (“UPF”) at the Y-12 National Security Complex (“Y-12”). The Y-12 Complex, located in Oak Ridge, Tennessee, was originally built as a key part of the Manhattan Project, and was expanded during the Cold War, two endeavors of unquestionable national significance. Compl. ¶¶ 32–36. Today, the Y-12 Complex continues to be critically important on a national scale as one of the principal facilities at which the United States manufactures, processes, and stores highly enriched uranium for use in nuclear weaponry. *Id.* ¶ 33. Indeed, the government’s own transfer motion emphasizes the national significance of the Y-12 Complex by noting that “[e]very weapon in the U.S. Nuclear stockpile has components manufactured, maintained or ultimately dismantled at the Y-12 Complex.” ECF No. 7-1, at 2. In short, the Y-12 Complex’s history and ongoing operations have clear national significance.

However, despite the Y-12 Complex's unquestionable national importance, the site is highly contaminated and reliant on obsolete and dilapidated buildings. Most of the buildings at Y-12 are over forty years old; more than 70 percent of the floor space at Y-12 was built before 1950 as part of the Manhattan project. Compl. ¶ 34. According to the NNSA, "[m]ission-critical operations are scattered across multiple 40- to 60-year-old facilities," which are "oversized, contain technologically obsolete equipment of low reliability, and require excessive maintenance to maintain minimum capability." *Id.* The older buildings at Y-12, which the NNSA has described as "old, oversized, and inefficient," do not meet modern building codes or modern fire codes and are at significant risk in the event of a natural disaster such as an earthquake. *Id.* Indeed, the Defense Nuclear Facilities Safety Board, which Congress charged with reporting on the safety and status of the nation's defense nuclear facilities, *see* 42 U.S.C. § 2286a, has stated that these deficiencies are "safety significant" and that in the event of a major earthquake would likely face "progressive collapse," which would cause "criticality accidents"—i.e. uncontrolled nuclear reactions—with "significant radiological consequences" including "potentially serious public consequences." *Id.* ¶¶ 65–66, 108–109. The Y-12 Complex is also highly contaminated with nuclear and toxic materials; the entire Complex has been listed as a Superfund site since 1989 but has never been entirely cleaned up. *Id.* ¶ 36. Indeed, many of the obsolete buildings at Y-12 themselves pose serious waste disposal problems, because, according to the NNSA, they "are costly to maintain and have no inherent value for future missions." *Id.* ¶¶ 37–38.

Facing the serious degradation of this facility of indisputable national import, the NNSA has determined that "[i]n order to remain safe, secure, and effective, the U.S. nuclear stockpile must be supported by a modern physical infrastructure." *Id.* ¶ 40. As such, in 2011 the NNSA decided to construct a modern UPF contained in a single building, which would have been built

to modern building and seismic standards, to support the nation's nuclear weapons program. *Id.* ¶ 43–46. However, the agency soon encountered significant cost overruns and increasingly intense oversight from Congress. *Id.* ¶¶ 51–54. Facing close scrutiny from Washington, the agency instead decided to build several new buildings and to continue to rely on several older, structurally problematic buildings for important aspects of the Complex's national security mission. *Id.* ¶¶ 55–58.

This case concerns the NNSA's failure to consider critical information when deciding not to build a single new UPF facility but instead to continue to rely on old buildings with clear structural vulnerabilities. Defendant Frank Klotz, whose office is located in the District of Columbia, made this decision in a 2016 Amended Record of Decision. 81 Fed. Reg. 45,138, (July 12, 2016). The information that Plaintiffs allege the NNSA unlawfully failed to address also originated in the District of Columbia, when several federal agencies in this area issued warnings that the NNSA failed to take into account when making the decision at issue. *E.g.* Pls. Ex. A (letter from DNFSB in Washington, D.C. to NNSA). Thus, the DNFSB warned the NNSA that an earthquake could cause existing facilities to collapse, causing nuclear accidents and the release of radiological materials. *Id.*; Compl. ¶¶ 63–74. The United States Geological Survey ("USGS")¹ warned the NNSA that such an earthquake was more likely than previously believed. Compl. ¶¶ 59–62. And the Department of Energy's Inspector General ("IG") warned the NNSA that the agency's "[d]elays in the cleanup and disposition of contaminated excess facilities expose the Department, its employees and the public to ever-increasing levels of risk." *Id.* ¶¶ 75–78. When making the decision that Plaintiffs challenge, the NNSA failed to expressly consider

¹ The USGS report was issued from the agency's headquarters in Reston, Virginia, a suburb of Washington, D.C.

any of these very serious warnings. *Id.* ¶¶ 79–94. In short, this case concerns a decision made by one federal agency in Washington, D.C. that failed to properly take into consideration information furnished by other federal agencies located in the Washington, D.C. area, regarding a matter that bears on the safety and security of the nation’s nuclear weapons program

STATUTORY AND REGULATORY FRAMEWORK

28 U.S.C. § 1404(a) provides the Court discretion to transfer a case to another forum in another district, or division within a district, of the federal judiciary:

For the convenience of the parties and witnesses, in the interest of justice, a district court may transfer any civil action to any other district or division where it might have been brought.

The section is intended to be a “federal house keeping measure” for the just and efficient resolution of claims within a unified federal judiciary system. *Piper Aircraft Co. v. Reyno*, 454 U.S. 235, 255 (1982). “The idea behind § 1404(a) is that where a ‘civil action’ to vindicate a wrong—however brought in a court—presents issues . . . that make one District Court *more convenient* than another, the trial judge can . . . transfer the whole action to the more convenient court.” *Con’t Grain Co. v. The FBL-585*, 364 U.S. 19, 26 (1960) (emphasis added).

Courts analyze factors relating to the “private” and “public” interests in having a case resolved in a particular forum. These include: (1) Plaintiffs’ choice of forum; (2) Defendants’ choice of forum; (3) the convenience of the parties; (4) the convenience of the witnesses; (5) the ease of access to proof; (6) where the claims arose; (7) the transferee court’s familiarity with the law; (8) the relative congestion of the transferor and transferee courts’ calendars; and (9) the interest in deciding purely local controversies in the locality. *See, e.g., Greater Yellowstone Coal*, 180 F. Supp. 2d at 127-28. Not all of these factors receive equal weight as “there is ordinarily a strong presumption in favor of the plaintiff’s choice of forum, which may be

overcome only when the private and public interest factors clearly point toward trial in the alternative forum.” *Piper Aircraft*, 454 U.S. at 255. Thus, as the D.C. Circuit has made clear, a district court should “accord[] [plaintiff’s] forum choice substantial weight” in evaluating a transfer motion. *In re Scott*, 709 F.2d 717, 720 (D.C. Cir. 1983); *see also Sierra Club v. Van Antwerp*, 523 F. Supp. 2d 5, 11 (D.D.C. 2007) (“[A] court may not transfer a case ‘from a plaintiff’s chosen forum simply because another forum, in the court’s view, may be superior to that chosen by the plaintiff.’” (quoting *Pain v. United Techs. Corp.*, 637 F.2d 775, 783 (D.C. Cir. 1980))).

It is the Defendants’ burden, as the moving party, to establish that transfer is appropriate in light of these considerations. *See, e.g., Fund For Animals v. Norton*, 352 F. Supp. 2d 1, 2 (D.D.C. 2005) (citing cases). Denial of a transfer request is appropriate where the government’s motion “appears to be a calculated attempt to force [the plaintiff] to pursue its APA claims in federal court in [another jurisdiction], despite the fact that [the plaintiff] has selected the instant forum,” especially because “it ‘is hardly inconvenient for [an agency] to litigate in the District [of Columbia], where [it is] headquartered.’” *Coal River Mountain Watch v. U.S. Dep’t of the Interior*, 146 F. Supp. 3d 17, 19-20, 31 (D.D.C. 2015).

ARGUMENT

This case should proceed in the District of Columbia. It is the forum where Plaintiffs chose to file for entirely legitimate reasons; the forum where the named Defendants and their agency headquarters are located; the forum where Plaintiffs’ counsel are located and where it is therefore most affordable for the non-profit Plaintiffs to pursue this litigation; a forum which routinely resolves this sort of administrative record case brought against federal agencies; the forum in which the challenged decision was made; the forum in which the information that

Plaintiffs allege Defendants failed to consider originated; and the most appropriate forum for a case concerning the nationally important issue of the safety of the United States nuclear weapons program. Because these important factors weigh heavily in favor of litigating this matter in the District of Columbia, and Defendants have proffered no offsetting reasons why any party's interest would be served through transfer under the circumstances here, Defendants cannot carry their burden of establishing that transfer is justified.

I. DEFENDANTS CONCEDE THAT THE DISTRICT OF COLUMBIA IS A PROPER FORUM FOR THIS LITIGATION.

Although the government argues that this case could have been brought in the Eastern District of Tennessee, ECF No. 7-1, at 6—a point that Plaintiffs do not dispute—Defendants conspicuously do not—and cannot—argue that the District of Columbia is somehow an improper forum to litigate this case. Instead, Defendants “admit that venue is permissible in the District of Columbia.” ECF No. 8 ¶ 2.

II. THE TRANSFER FACTORS WEIGH HEAVILY IN FAVOR OF RESOLVING PLAINTIFFS' CLAIMS IN THE DISTRICT OF COLUMBIA.

A. The Government Greatly Overstates The “Local” Nature of this Nationally Significant Case.

The government's transfer motion relies most heavily on the purported local interest in resolving this ostensibly “local dispute” in Tennessee. ECF No. 7-1, at 7–11. However, the government greatly overstates the “local” nature of this case while downplaying or ignoring the significant ties that this case has to the District of Columbia and the issues of clear national significance in this case. Thus, Defendants emphasize that the Y-12 Complex is located in Oak Ridge, Tennessee and that NNSA staff in Tennessee prepared NEPA documents and drafts of the relevant decision documents—which were ultimately signed in Washington, D.C. Similarly,

Defendants argue that this case concerns environmental impacts such as nuclear or toxic contamination that would be isolated to Tennessee.²

The government's attempts to minimize the scale of the issues in this case ignores the grave risks that the NNSA is taking with regard to the security of the nations' nuclear weapons program. In fact, the environmental consequences if, as the Defense Nuclear Facilities Safety Board and others have warned, an earthquake causes structural collapse of Y-12 facilities and release of nuclear and toxic materials would rank among the worst nuclear disasters in the nation's history and would indisputably have severe consequences for the U.S. nuclear weapons program. *See* Compl. ¶¶ 84–92 (noting that the Y-12 facility's vulnerable existing buildings, which do not meet modern safety standards, are “mission critical”); *see also* ECF No. 7-2 ¶ 2 noting that Y-12's facilities “play a critical role in securing our nation and the world”).

Moreover, while the resulting nuclear and toxic contamination would impact an area with a 50-mile radius, including the entire city of Knoxville, Tennessee, the consequences to the U.S. nuclear weapons program would be felt across the entire nation. As Defendants state, “[e]very weapon in the U.S. Nuclear stockpile has components manufactured, maintained or ultimately

² Defendants attempt to emphasize the involvement of local federal officials by erroneously asserting that “Plaintiffs challenge NNSA’s determination in an April 16, 2016 ‘Supplement Analysis’ that it did not need to prepare a new or supplemental Environmental Impact Statement.” ECF No. 71, at 3. However, this determination was actually made in the Amended Record of Decision (“AROD”), which was signed in Washington, D.C. *See* 81 Fed. Reg. 45,138, 45,140 (July 12, 2016) (formally determining that “the existing 2011 ROD for the Y-12 SWEIS can be amended, and no further NEPA documentation is required to implement the proposed action at Y-12.”). Indeed, Plaintiffs *must* challenge the AROD, since that document reflects the culmination of the agency’s decision-making process and is thus the final agency action subject to challenge under the APA. Thus, the involvement of federal officials in Tennessee does not support transfer. *See Wilderness Soc’y v. Babbitt*, 104 F. Supp. 2d 10, 13 (D.D.C. 2000) (acknowledging that where “the disputed FEIS was drafted in” the transferee district, but the ROD was signed “here in [D.C.] and at least some policy review occurred” here, “the outcome of this factor is”—at best—“inconclusive”).

dismantled at the Y-12 Complex.” ECF No. 7-1 at 2. Moreover, the Y-12 Complex also supports the Navy’s nuclear fuel needs and supports the United States’ participation in global nuclear non-proliferation efforts, including dismantling of nuclear weapons components and storage of highly enriched uranium. *See* ECF No. 7-2 ¶ 2 (“Y-12’s nuclear proliferation programs play a critical role in securing our nation and the world.”). Thus, the consequences of the inadequate review claimed by Plaintiffs would not be limited to Tennessee but would have a significant impact on the nation’s nuclear weapons program, military preparedness, and U.S. participation in global nuclear non-proliferation programs. Accordingly, far from being the “local” dispute that Defendants portray, this case has clear national significance that strongly supports retaining this case in the District of Columbia. *See Wilderness Soc’y v. Babbitt*, 104 F. Supp. 2d 10, 13 (D.D.C. 2000) (denying transfer where the subject of the dispute had “consistently been treated as a national resource”).

Although the government attempts to downplay this case’s nexus to Washington, D.C. and relies on *Otter v. Salazar*, 718 F. Supp. 2d 62 (D.D.C. 2010), and *Shawnee Tribe v. United States*, 298 F. Supp. 2d 21 (D.D.C. 2002), those cases are quite distinct from the case at bar and do not support the government’s position. *Shawnee Tribe* concerned the disposal of a military base in Kansas, to which the Tribe believed it was entitled under a treaty with the United States; this Court found that “the most persuasive factor favoring transfer” was that the case presented both truly local land use planning issues about whether and how the property would be developed to benefit a nearby metropolitan center, as well as complex legal issues that this Court found would benefit from the relative expertise of local courts familiar with such issues. 298 F. Supp. at 26–27. Similarly, in both *Shawnee Tribe* and *Otter*, the other district courts to which this

Court transferred those cases had already exercised jurisdiction over closely related issues. *Id.* at 27; *Otter*, 718 F. Supp. 2d at 63.

No such factors are present here. This case does not present issues about the disposal of federal property in which local governments have an interest, does not present legal issues about which other courts have greater expertise, and Defendants do not argue that any similar case regarding the design of the Y-12 facility has ever been litigated in the Eastern District of Tennessee. *See Otay Mesa Property L.P. v. U.S. Dep't of Interior*, 584 F. Supp. 2d 122, 126 (D.D.C. 2008) (providing that where a “controversy involves an issue of federal environmental law . . . that is subject to judicial review under the APA” and where “no local or state property laws are involved[,] [t]his factor weighs against transfer.”).

Indeed, this case not only involves an issue of unquestioned national security significance, but it presents far greater ties to the District of Columbia than any precedent cited by Defendants, which only provide ample reason for this case to proceed in this Court. Not only were the original 2011 decision to construct the UPF as a single new building and the revised 2016 decision to instead continue using older, vulnerable buildings both signed in Washington, D.C., but the information that Plaintiffs allege Defendants failed to consider also originated in Washington, D.C. As explained, Plaintiffs’ claim relies heavily on a series of letters and reports from the Defense Nuclear Facilities Safety Board and from the Department of Energy’s Inspector General, which Plaintiffs allege Defendants unlawfully failed to consider. All of these documents were sent from federal agency offices in Washington, D.C. *See* Pls. Exs. A, B. Similarly, Plaintiffs allege that Defendants failed to adequately consider a 2014 set of seismic maps from the USGS, which is also located in this area. *See* USGS, Documentation for the 2014 Update of the United States National Seismic Hazard Maps, *available at*

<https://pubs.usgs.gov/of/2014/1091/>. Moreover, the DNFSB’s office on Washington, D.C. has continued to provide input directly to Defendant Frank Klotz in Washington, D.C., as reflected in a series of letters sent this year. *See* Pls. Exs. C, D (letters from DNFSB in Washington, D.C. to Defendant Klotz in Washington, D.C.). Thus, this case concerns the failure of a federal agency in Washington, D.C. to consider the input of other federal agencies also located in Washington, D.C. Accordingly, contrary to Defendants’ attempt to portray this as a controversy “local” to Tennessee, this case clearly has both national significance and clear ties to the District of Columbia.³

B. Plaintiffs’ Choice of Forum Is Entitled To Deference.

Plaintiff’s choice of forum clearly supports maintaining this case in Washington, D.C. As the Supreme Court explained in *Piper Aircraft*, “there is ordinarily a strong presumption in favor of the plaintiff’s choice of forum, which may be overcome only when the private and public interest factors clearly point toward trial in the alternative forum.” 454 U.S. at 255.

As described above, there are many compelling reasons why Plaintiffs chose to file this case in Washington, D.C.: the challenged decision was made in the District of Columbia; the information that Plaintiffs allege Defendants failed to consider originated in the District of Columbia; Plaintiffs’ counsel and all named Defendants are located in the District of Columbia;

³ Defendants’ depiction of the involvement of D.C.-based officials is notably silent as to their degree of participation *during* the drafting of the documents at issue. Although Defendants acknowledge that “NNSA Headquarters in Washington, D.C. provides guidance to the NNSA field office in Oak Ridge,” they vaguely assert that they received “limited input from Headquarters” without specifying any details about the involvement of Headquarters *during* the drafting process. ECF No. 7-2 ¶¶ 13–14. Similarly, Defendants assert that the field office made “no substantive changes” *after* sending formal drafts of decision documents to Headquarters, but are notably silent as to the degree to which D.C.-based officials provided information or guidance *during* the drafting process. *Id.* It is likely that the administrative record will confirm significant input from NNSA Headquarters in Washington, D.C.

and this case concerns the safety of the nation's nuclear weapons program, a nationally significant issue most suitable for litigation in the nation's capital.

Defendants attempt to downplay, or entirely ignore, these significant ties to the District of Columbia to argue that the proper deference to Plaintiffs' choice of forum should receive diminished weight because of a "limited factual nexus" between the District and the subject of this lawsuit. However, as discussed above, contrary to the government's argument that the District of Columbia has a limited factual nexus to this litigation, in reality this case concerns issues of clear national significance, and decisions made and information provided in Washington, D.C., which are properly the focus of litigation in the District of Columbia. Accordingly, there is no sound reason for this Court to find that Plaintiffs' choice of forum should receive any diminished weight. Instead, this Court should find that the first transfer factor weighs heavily in Plaintiffs' favor in light of all the important reasons supporting Plaintiffs' common-sense decision to file this case of national significance in the nation's capital.

C. The District of Columbia is the Most Convenient Forum for Plaintiffs and Their Counsel and Poses No Inconvenience to Defendants.

Although the government largely ignores the issue of the convenience of the parties, the District of Columbia is clearly the most convenient forum in which to litigate this case. Plaintiffs are non-profit organizations and individual citizens with limited financial resources and are represented by public interest attorneys with experience litigating this type of issue in this Court and whose law firm is located in Washington, D.C. If this matter is litigated in this Court, it will certainly be more affordable for Plaintiffs. *See In re AT&T Access Charge Litigation*, No. 05-1360, 2005 WL 3274561, at *4 (D.D.C. Nov. 16, 2005) (“[W]here convenience of counsel bears directly on the cost of litigation, it becomes a factor to consider.”); *see also Green v. Footlocker Retail, Inc.*, No. 04-1875, 2005 WL 1330686 (D.D.C.2005). Similarly, because

Defendants are located in Washington, D.C., and their lead counsel is located in Colorado and must thus incur travel expenses whether this case is litigated in the District or in Tennessee, litigating this case in the District of Columbia will cause no inconvenience for Defendants.⁴

D. Congestion in the Eastern District of Tennessee Weighs Against Transfer.

An additional factor that bears on whether to transfer is the relative congestion of the courts. *See Greater Yellowstone Coal.*, 180 F. Supp. 2d at 128. This consideration clearly weighs against transfer here. According to the United States District Courts' National Judicial Caseload Profile, as of June 30, 2017, the District Court for the District of Columbia has 3,985 pending cases spread between 15 judges, which yields an average of 266 pending cases per judge. *See Table N/A—U.S. District Courts Combined Civil and Criminal Federal Court Management Statistics (June 30, 2017)*, ADMIN. OFFICE OF THE U.S. COURTS (2017), http://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0630.2017.pdf/. In contrast, the District Court for the Eastern District of Tennessee has 2,419 cases spread between 5 judges, yielding an average of 484 pending cases per judge. *Id.* This disparate caseload has significant consequences for the amount of time it takes for a case to reach resolution. In the District of Columbia, civil cases tend to take 6.9 months from filing to disposition, whereas civil cases in the Eastern District of Tennessee tend to take 12.7 months—nearly twice as long. *Id.*

⁴ The government makes much of some of the Plaintiffs' residence in Oak Ridge and Knoxville, Tennessee, ECF No. 7-1, at 13–14, but the government's own cited authority makes clear that “[c]ases decided under Section 1404(a) . . . have laid much less emphasis on the residence factor.” *Kafack v. Primerica Life Ins. Co.*, 934 F. Supp. 3, 7 (D.D.C. 1996); *see also* ECF No. 7-1 at 10 n. 2 (citing *Kafack* for this proposition). Furthermore, where, as here, one plaintiff maintains an office in the District of Columbia, that organization's “residency is sufficient to tip the balance in favor of th[e] [c]ourt's strong presumption in favor of venue in this District.” *Van Antwerp*, 523 F. Supp. at 11-12; *see also* ECF No. 1 at 1, 44 (Plaintiff NRDC's address is in the District of Columbia).

Accordingly, the factor of the relative congestion of the courts clearly weighs in favor of this case proceeding in the District of Columbia.

E. Neither the Convenience of Witnesses Nor Access to Proof Favors Transfer Because This Is an Administrative Record Review Case.

Because this case will be resolved on cross-motions for summary judgment based on an administrative record, this factor does not support the government's motion to transfer. *See Ravulapalli v. Napolitano*, 773 F. Supp. 2d 41, 56 (D.D.C. 2011) (“The remainder of the private interest factors are of limited value in this case because Plaintiffs' claims are primarily legal in nature and likely to be based solely on the administrative record and resolved on summary judgment.”). Thus, “the convenience of witnesses and access to proof [are] irrelevant to the issue of transfer of venue” in this case. *Van Antwerp*, 523 F. Supp. 2d at 12.⁵

F. Courts in the District of Columbia Regularly Resolve This Type of Claim.

The factor of courts' relative familiarity with governing case law does not support transferring this case, as there is no evidence that the transferee court has any greater experience with the relevant issues. Indeed, the District Court for the District of Columbia routinely hears cases under the APA and NEPA, which concern matters that transpire all around the nation. More specifically, cases involving the nation's defense nuclear facilities are routinely litigated in the District of Columbia. *See, e.g., Beyond Nuclear v. U.S. Dept. of Energy*, 233 F. Supp. 3d 40 (D.D.C. 2017) (concerning NEPA compliance for decision to transport nuclear materials to defense nuclear facility in South Carolina); *Foote v. Chu*, 928 F. Supp. 2d 96 (D.D.C. 2013) (concerning alleged discrimination in hiring for an NNSA facility in New Mexico); *El Paso*

⁵ In the highly unlikely event that “such testimony in fact becomes necessary, defendants can at that time file another . . . motion to transfer venue setting forth justifications for transfer including whether the convenience of the parties and witnesses weigh in favor of transfer.” *Van Antwerp*, 523 F. Supp. 2d at 12

Natural Gas Co. v. U.S., 774 F. Supp. 2d 40 (D.D.C. 2011) (involving an APA claim about contamination from mining uranium in Nevada for use in nuclear weapons); *Nuclear Energy Institute, Inc. v. Env'tl. Protection Agency*, 373 F.3d 1251 (D.C. Cir. 2004) (involving NEPA claims regarding proposed nuclear waste disposal facility in Arizona); *LeBeouf, Lamb, Green, & MacRae, LLP v. Abraham*, 205 F.R.D. 13 (D.D.C. 2001) (concerning APA claim about employment of contractors for proposed nuclear waste facility in Arizona); *Oil, Chemical and Atomic Workers Intern. Union, AFL-CIO v. Richardson*, 214 F.3d 1379 (D.C. Cir. 2000) (concerning a NEPA challenge to a decommissioning project at defense nuclear facility in Oak Ridge, Tennessee). Accordingly, there can be no doubt that, in light of the fact that the District of Columbia regularly resolves the types of claims in this case—and regularly resolves claims involving defense nuclear facilities around the nation—that this factor does not support the government's transfer motion.

G. Defendants' Choice of Forum Does Not Tip In Favor of Transfer.

Defendants erroneously argue that their choice of forum should receive weight because the environmental effects of the collapse of Y-12 facilities would most directly affect Tennessee lands and residents and because the case ostensibly arose in Tennessee. However, as described above, Defendants conveniently ignore the fact that the collapse of portions of this nationally significant facility would have highly significant impacts on the nation's nuclear weapons program, the nation's military preparedness, and the nation's participation in global nuclear non-proliferation programs. Similarly, Defendants conveniently ignore the fact that this case arose when a decision was made by a federal agency in Washington, D.C. without considering important information furnished by other federal agencies in the Washington, D.C. area. Thus, contrary to Defendants' arguments, their choice of forum is not entitled to any significant weight

in the Court's analysis of the transfer factors, and certainly cannot tip the balance in favor of transfer where other, weightier transfer factors militate against transfer, as described above.

CONCLUSION

This nationally significant case about risks that a D.C.-based federal agency is taking with regard to a defense nuclear facility of unquestionable national significance should proceed in Washington, D.C. Plaintiffs respectfully request that this Court deny Defendants' transparent forum shopping in their motion to transfer.

Respectfully submitted

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Exhibit A

2015 Report from Defense Nuclear Facilities Safety Board

Jessie H. Roberson, Vice Chairman

Sean Sullivan

Daniel J. Santos

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



February 4, 2015

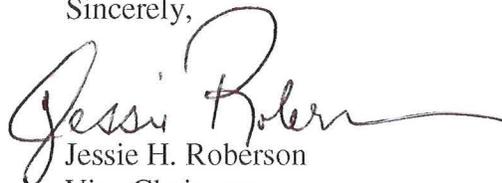
Mr. Steven C. Erhart
Manager, NNSA Production Office
U.S. Department of Energy
P.O. Box 2050, Mail Stop 8009
Oak Ridge, Tennessee 37831

Dear Mr. Erhart:

The enclosed report is provided for your information and use as the National Nuclear Security Administration (NNSA) decides on a path forward for long-term mission work at the Y-12 National Security Complex. Building 9204-2E and the 9215 Complex have known structural performance deficiencies and do not meet modern structural design requirements. These deficiencies result in an increased potential for structural collapse and release of radiological material following certain seismic events. NNSA accepted this risk for near-term mission work with the intent of replacing the capabilities in these facilities with the planned Uranium Processing Facility (UPF). However, following an evaluation of alternative approaches for the UPF project in early 2014, NNSA removed the capabilities of Building 9204-2E and the 9215 Complex from the UPF project scope.

The Defense Nuclear Facilities Safety Board's staff has reviewed the structural performance of Building 9204-2E and the 9215 Complex to refine our understanding of the facilities' deficiencies. The report of this review is enclosed for your information and use as you and your staff re-evaluate these facilities for possible lifetime extension and mission capability additions.

Sincerely,


Jessie H. Roberson
Vice Chairman

Enclosure

c: Ms. Madelyn Creedon
Mr. Joe Olencz

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

November 14, 2014

MEMORANDUM FOR: S. A. Stokes, Technical Director

COPIES: Board Members

FROM: D. Andersen and B. Caleca

SUBJECT: Structural Evaluations of the 9215 Complex and Building 9204-2E at the Y-12 National Security Complex

This report documents a review by members of the Defense Nuclear Facilities Safety Board's (Board) staff of structural calculations for natural phenomena hazards (NPH) at the 9215 Complex and Building 9204-2E at the Y-12 National Security Complex (Y-12). The review focused on the structural calculations and drawings to identify gaps between these facilities' designs and modern seismic design practices.

Background. The National Nuclear Security Administration (NNSA) and Babcock & Wilcox Technical Services Y-12, LLC (B&W)¹, as part of an overall aging management strategy, conducted Facility Risk Reviews (FRRs) in 2007 and 2012 to assess the overall condition of Building 9204-2E and the 9215 Complex. The primary objective of the FRRs was to identify the highest priority repairs and facility modifications that would be necessary to ensure continued safe operations in these facilities until their capabilities could be redeployed in the Uranium Processing Facility (UPF). The 2012 FRRs assumed operations would continue in both facilities until at least 2030. Recent issues with the UPF project's cost and schedule caused NNSA to evaluate alternatives to its overall enriched uranium infrastructure replacement strategy. As a result, NNSA is changing its approach to rely on the deployment of new capabilities in Building 9204-2E and the 9215 Complex to support transition out of Building 9212, which is the highest hazard nuclear facility at Y-12 and is in poorer condition than Building 9204-2E or the 9215 Complex. The newly selected approach also caused the timetable for transitioning operations out of the 9215 Complex and Building 9204-2E to slip to an undetermined date. As such, site personnel have stated their intent to re-evaluate the FRR conclusions in the context of extended lifetime and additional mission capabilities for these facilities. This effort is scheduled for completion in the middle of calendar year 2015.

Deficiencies in Structural Ductility for Building 9204-2E and the 9215 Complex.
When structural components deform in a ductile manner, they typically reduce the overall demands on the structure and, if properly designed, concentrate structural damage in preferred ways and enhance structural reliability. Modern codes and standards for building design account

¹ Consolidated Nuclear Security, LLC (CNS) took over as the Y-12 contractor on July 1, 2014.

for ductility and allow for reductions in elastic demands by accounting for the inelastic energy absorption capability of a structural system. Department of Energy (DOE) Standard 1020-2002, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*, discusses the importance of ductile design to meet expected performance goals.

The designs of the 9215 Complex and Building 9204-2E do not include the ductile design concepts that are used in modern structural design, and thus lack seismic margin to collapse compared to a contemporary structure designed to the same demands. This weakness was acknowledged by B&W engineers, who used full elastic demands to qualify non-ductile structural components. Should seismic demands exceed the elastic capacities of certain structural members, undesirable failure modes may be triggered such as column or joint failures that can rapidly lead to progressive collapse.

9215 Complex Structures. The 9215 Complex consists of Buildings 9215, 9998, 9215A, 9811-2, 9996, and A-2 Wing of Building 9212. Because A-2 Wing is part of Building 9212, and Building 9996 neighbors Building 9212, they are not part of the scope of this review. In addition, because Building 9215A² and Building 9811-2³ are minor structures, they were also excluded from this review. In its review of the 9215 Complex, the review team focused on the three main structures: Building 9215 M Wing, Building 9215 O and P wings, and Building 9998. These buildings were constructed in the 1950s.

Lateral stiffness for Buildings 9215 and 9998 is provided by steel bracing members, mostly made of single- and double-angle steel braces, plus architectural masonry hollow clay tile (HCT) infilled walls. The masonry walls are not credited for structural strength, but their stiffness is considered in the seismic analysis and changes the structural response of the building. During a design basis earthquake (DBE), many of these infill walls would be severely damaged; however, some would survive and continue to contribute to the lateral stiffness of the building. B&W performed extensive testing and analysis to demonstrate the survivability of these walls in response to seismic events for different wall configurations, penetrations, and offsets from the framing systems [1].

Structural Performance of the 9215 Complex. In the latest structural evaluation for the 9215 Complex, performed in 2005 [2], B&W analysts used a site-specific seismic spectrum along with a 50% reduction in the return period of the seismic hazard to calculate seismic demands. Both the site-specific analysis and return period reduction are allowed in DOE Standard 1020-2002 for existing Performance Category (PC)-2 structures. The spectrum was then additionally reduced by an R factor to account for inelastic behavior in the structure consistent with DOE standards for PC-2 facilities. The motivation for re-performing the structural analysis in 2005 was that the site-specific hazard response spectrum was lower than the code-based hazard spectrum used in the 2002 analysis of the 9215 Complex. The new spectrum, developed from the 2003 Probabilistic Seismic Hazard Analysis, resulted in reduced demands for the frequencies of interest for this structure (below 9 Hz).

² Building 9215A is a maintenance annex constructed of unreinforced masonry on the east side of Building 9215.

³ Building 9811-2 is a tanker truck bay covered by steel siding on the west side of Building 9215.

The analyses performed for the 9215 Complex were limited to linear elastic methods. To account for the behavior of masonry infill walls, 10% damping was selected based on research performed on infill-type structures, and an R factor of 3 was selected. Because R factors are based on 5% damped structural response, an adjusted R factor of 2.4 was used in conjunction with 10% damping for the response spectrum analysis of the structure; this approach is consistent with the intent of American Society of Civil Engineers (ASCE) code provisions for design. Based on B&W's analysis, the demands on the 9215 complex structural elements exceeded capacities in a number of locations, making the structure unable to meet PC-2 demands for an existing facility. According to the analysis, the extent of overstressed structural elements in the 9215 Complex includes, but is not limited to, the following:

- Several undersized braced frame connections.
- Several axially overstressed columns.
- Several axially overstressed vertical braced frame members.
- Loss of infilled HCT walls from in-plane and out-of-plane motions.
- A subgrade concrete wall that resists soil pressures.

The 9215 Complex structures are credited in the safety analysis as safety-significant. The 2005 analysis estimates that under a site-specific earthquake of approximately 0.12g peak ground acceleration, significantly below the PC-2 existing facility seismic demand, the 9215 Complex structures will have reached a damage state where progressive collapse of the structure is likely, damaging or destroying many if not all areas of the structure as a result. The safety analysis accepts this performance in the short term by formally crediting the structure to survive a 100-year return period earthquake (with an estimated site-specific demand of 0.05g), making structural collapse of the facility an unlikely, rather than anticipated hazard.

Review Team Concerns with the Structural Performance of the 9215 Complex. In addition to the aforementioned deficiencies where elements are overstressed by the PC-2 existing facility seismic demand, there are a number of non-ductile features within the structure that limit the ability of the 9215 Complex to withstand large inelastic demands for seismic hazards beyond the PC-2 existing facility seismic demand. Additionally, because the 9215 Complex is made up of several different structures with dissimilar layouts, there is the possibility for undesirable torsional motions due to this irregularity, which can result in unevenly distributed forces during a seismic event.

Bracing Connections—Modern design practices preferentially concentrate nonlinear deformations in braces before the remainder of the structure undergoes nonlinear behavior, i.e., it is desirable that the ultimate stress in tension of a brace is well beyond the yield strength of the member but less than the yield strength of the connection. Gusset plate connections are now designed such that the ultimate axial load of a brace can be transferred through the connection to prevent brittle failure modes such as block shear and bolt shear. Special Concentric Braced Frames (SCBF), which are the only braced frame system permitted under the International Building Code in high-seismic regions in the United States for structures that are high-hazard or high-occupancy, require this type of design approach. If a structure is permitted to be designed as an Ordinary Concentric Braced Frame (OCBF), and the connections cannot be made to

develop the full tension force of a yielding brace, elastic load capacities would be permitted. The lack of lateral system ductility in such a structure would not be considered desirable when compared to best practices such as those outlined by the National Earthquake Hazards Reduction Program.

The current bracing connections of the 9215 Complex largely control the braced frame capacities, with failures in bolt or rivet shear predicted prior to yielding of the brace members in tension. Block shear typically does not control over bolt shear in these connections, but there are a number of cases where block shear capacities are also well below the brace yield capacity. B&W staff identified these features in structural analyses of the 9215 Complex; however, they only identified connections that fail under a PC-2 existing facility seismic load as candidates for retrofitting in the current analysis of record. The site has not performed retrofits because its priorities for facility improvements have been made based on the assumption that the 9215 Complex would be replaced by UPF in the near future. If the site's priorities were to change and NNSA elected to meet the detailing criteria for modern SCBF systems as a risk-reduction initiative, it is likely that every gusset plate of the lateral bracing system would need to be replaced with plates conforming to current code requirements.

Slenderness of Bracing—Slenderness limits on OCBF and SCBF brace members currently in structural steel codes did not exist when the 9215 Complex was constructed. A significant number of braces have slenderness ratios that exceed current code minimums for OCBF and SCBF systems. This could result in brace members that buckle in compression during NPH loadings. It is typical for OCBF systems to have braces with a higher buckling capacity. The slenderness of 9215 Complex braces is thus another design feature that limits its inelastic capacity significantly compared to modern structures of similar elastic strength.

B&W engineers acknowledged this noncompliance with modern codes and standards, and justified not replacing bracing members by considering the braces as tension-only structural components, which would not be credited to resist any compressive loads. The review team believes this is a reasonable approximation of existing brace behavior. Currently, ASCE codes do not allow the primary lateral system of a new structure to be designed using tension-only bracing due to their limited structural ductility. Meeting modern code requirements would require replacing a large number of brace members in the 9215 Complex. In turn, associated brace connections would need to be enlarged to accommodate the larger braces.

Linear Elastic Modeling—To evaluate the structure's component response more accurately than the results from linear elastic models, B&W engineers used a number of intermediate steps to account for incremental failures or nonlinear behavior outside of the linear elastic dynamic analyses. For brace connections and vertical load resisting elements (typically columns), an overstrength factor was used in conjunction with an elastic analysis. Evaluations of the infilled walls required an iterative process to determine the expected building response consistent with the expected number of walls lost.

One of the limitations of the above modeling approach is that it does not capture the most accurate set of structural deficiencies for the 9215 Complex. If NNSA intends to consider retrofits to the structure or re-evaluate it to better quantify and understand the risk of collapse,

more advanced analysis techniques should be pursued to determine building performance and the complete set of areas requiring retrofit. A nonlinear analysis could: capture the effects of connection response, brace overstrength, redistribution of loads after damage, degradation of structural elements with cyclical loads, and the variations of damping in the system; determine which braces might exhibit nonlinear behavior prior to failure; account for asymmetric stiffness and capacity of slender braces; and account for the complex behavior of masonry infilled walls. Additionally, the current In-Structure Response Spectra (ISRS) used to qualify equipment in the 9215 Complex are most likely inappropriate considering the nonlinear behavior of the structure. The ISRS could also be revisited in a new analysis.

Building 9204-2E Structure. Constructed in the late 1960s, Building 9204-2E is a three-story, reinforced concrete moment frame structure. The 1960s-era design for the concrete structure predates modern seismic detailing codes for reinforced concrete moment frames. The building is supported on a basemat foundation, and its first floor is partially submerged below grade. The exterior walls of the structure are predominantly non-structural unreinforced masonry, with the exception of the first floor walls below grade, which are reinforced concrete. The building has several features that are advantageous for seismic performance: the structure has a regular and symmetric layout, resulting in minimal torsion of the building during dynamic loading, and the building column capitals have drop panels that provide additional punching shear strength (i.e., out-of-plane slab strength near the columns). Similar to the 9215 Complex, the structure's frame is infilled by masonry walls, most of which are HCT, but with a few areas where concrete block was used. At one location, siding replaced the masonry infill as a repair to address issues with wall movement due to exposure to the sun. The Building 9204-2E structure is credited in the safety analysis as safety-significant and has been qualified for the PC-2 existing structures seismic demand.

Structural Performance of Building 9204-2E. Although the Building 9204-2E safety basis only requires the facility to be qualified for PC-2 seismic requirements, the latest NPH evaluation performed in 2004 qualified the building to PC-3 existing structure seismic requirements for collapse prevention [3]. Both the PC-2 and PC-3 design criteria are based on the same return period earthquake, though PC-2 designs are allowed to take inelastic reduction factors. For this facility, the use of full elastic demands on critical or non-ductile components in the building structure make PC-2 and PC-3 evaluations nearly identical. The expected damage state of the facility for the existing facility seismic hazard will include damage or loss of some infilled walls and a loss of active or passive confinement as a result of a PC-3 or PC-2 seismic event, but the primary frame structure would be largely intact and undamaged.

The latest B&W seismic analysis utilized a 10% damped spectra, appropriate for a building with masonry infill walls, and a ductility factor of unity, as required for PC-3 analysis. The analysis identified several columns near the x-ray vault of the building that could become overstressed; however, the analysis attributes this prediction to issues arising from modeling thick-walled structural elements. In addition, damage to the connector structure between Buildings 9204-2E and 9204-2 is expected during a DBE, and a number of interior partition walls constructed of unreinforced masonry are at risk of collapse throughout Building 9204-2E. The current analysis for interior partition walls shows many with demand-to-capacity ratios very close to unity, and any uncertainties in the ISRS generated for Building 9204-2E could challenge

these nonstructural features. For interior partition walls with inadequate capacity, updated analyses were performed using ISRS results from building analyses with the seismic demands from the latest Probabilistic Seismic Hazard Assessment as input. Where systems and components do not meet PC-2 criteria, efforts were made to remove or isolate material-at-risk to other areas of the facility [4].

As mentioned above, the area where most column damage is predicted after a seismic event is near the x-ray vault, a monolithic concrete structure with relatively high structural stiffness compared to the rest of the Building 9204-2E structure. Relative motion of the building and the vault may lead to overstressing the short concrete columns in shear in this area. B&W justified the adequacy of these short columns using a shear-friction-based shear capacity with equation 11-25 of American Concrete Institute (ACI) 349-01, *Code Requirements for Nuclear Safety-Related Concrete Structures* [5]. While the model uses an approximate height of four feet for these columns, most of that space is in fact taken up by the concrete floor slab, drop panel, and column capital. Only about six inches of clear height is solely the concrete column. The use of a shear-friction capacity may therefore be defensible for this configuration; however, that is not entirely clear or technically justified in the calculation. B&W performed two separate analyses with and without rotational stiffness for these column elements, and the results greatly affected shear values in columns located in the floor above. Any re-examination of the modeling assumptions used for Building 9204-2E should consider a more refined modeling of this region to better predict shear and moment demands.

Review Team Concerns with the Structural Performance of Building 9204-2E. In addition to the potential for structural damage to some concrete columns near the x-ray vault, the review team found that ductile detailing of the 9204-2E facility is lacking, which prevents the structure from adequately performing during large earthquakes beyond the DBE. For a number of areas, especially on upper floors, columns are not stronger than the ultimate moment strength of the adjacent beams. “Strong column, weak beam” behavior is required in modern concrete moment frame structural systems by ACI codes to prevent plastic hinging in concrete columns prior to beam hinging and to enhance structural ductility of the building system.

Furthermore, beam-column joints in modern buildings have very strict requirements for interior shear reinforcement and prohibit splicing of continuous steel reinforcement in the regions closest to the joint. Building 9204-2E’s beam-column joints have marginal shear reinforcement and in many cases beam longitudinal reinforcement is spliced directly inside the beam-column joints, which would significantly limit the ductility of the connection. In general, Building 9204-2E does not have shear reinforcement in beams and columns as required by ACI codes to develop the full plastic moment strength of these elements or to confine concrete adequately in seismically-detailed moment frames.

Evaluation of Existing Facilities in DOE Standard 1020. Both the 2002 and 2012 revisions of DOE Standard 1020 contain provisions for the evaluation of existing facilities. Over the life of a facility, seismic hazards are updated and may increase over time, or the facility may undergo degradation or have weaknesses identified. The guidance in DOE Standard 1020 provides criteria expected of existing facilities where conformity to modern codes and standards may not always be possible, and can inform NNSA of the risks for continued operation of

existing facilities. DOE Standard 1020-2002 allows a reduction of 50% of the return period for seismic hazards when evaluating existing facilities or systems that are “close to meeting criteria.”

In practice, this allowance led to most existing facilities using the 50% reduction in return period as a starting point of analysis before evaluating the gap between new design performance criteria and existing capacities. Chapter 9 of the latest version of the standard, DOE Standard 1020-2012, clarifies that “close to meeting criteria” implies being within 10% of the needed capacity for a design basis NPH. This revision further restricts reductions in seismic hazard response spectra to no more than 20%. However, the reduction of the return period from 2500 years to 1250 years for the Y-12 site reduces the seismic hazard by significantly more than 20% for most frequencies of interest for these facilities (over 40% in some cases). Many structural members of these facilities that were deemed adequate with a reduced seismic hazard still had demand-to-capacity ratios greater than 0.8, including for brittle failure modes such as punching shear.

It appears that the evaluations for the 9215 Complex and Building 9204-2E are both using what the review team believes is an inappropriate level of hazard reduction, especially in light of the clarifying language of DOE Standard 1020-2012. NNSA accepted⁴ these conditions based on the then-expected limited remaining operational life of these facilities and mission needs. However, recent changes to the scope of the UPF project change this outlook. New concepts are being considered to extend the use of the 9215 Complex and Building 9204-2E by at least twenty years.

Differences in Evaluation Techniques for DOE Standard 1020-2012—The addition of new processing capabilities to Building 9204-2E or the 9215 Complex (e.g., a major modification associated with installation of uranium electrorefining (ER) or direct electrolytic reduction processes) could drive new structural evaluations of these facilities. DOE Standard 1020-2012 states the following regarding major modifications to existing facilities:

For major modifications of existing facilities, the design of SSCs [structures, systems, and components] shall be based on the methods and criteria given in this standard for new facilities with the following caveat. On a case-by-case basis, analyses may be performed to evaluate the need to upgrade existing SSCs (including interfacing SSCs) in accordance with these criteria The analyses shall be submitted to the DOE for approval ... with recommendations and justification for the recommendations.

In a 2013 letter to the NNSA Production Office, B&W indicated that it considers the installation of ER equipment into Building 9215 to be a major modification, but concluded that it would not be in the best interest of NNSA to require significant structural upgrades. B&W supported this conclusion using a risk benefit argument, which is allowed by DOE Standard 1020-2012. B&W’s argument was based on the high cost of structural upgrades, the small risk

⁴ The current revision of the 9215 Complex Safety Evaluation Report states that “the significant impact on production activities, the line item cost, and the limited useful life does not support the PC-2 seismic upgrades for these facilities” [6].

of a significant seismic event during the period of ER operations, and the significant risk reduction of moving this capability out of Building 9212.

While B&W's conclusion does not necessarily reflect the position of the incumbent contractor, the review team believes it is a strong indication of the stance that CNS will take as the ER deployment project progresses, making it unlikely that a major modification determination alone would drive the contractor to re-analyze the structures in question using the latest version of DOE Standard 1020-2012. However, NNSA's recent decision to reduce the scope of the UPF project has rendered invalid some of the current assumptions⁵ associated with the risk of continued operation of these facilities, particularly their remaining operational lifetime. In response to this change, CNS and NNSA are in the process of defining the approach for re-evaluating the facility conditions and risks, and re-prioritizing the risk-mitigation projects needed to continue safe operations for the remaining operational lifetimes of these facilities. The staff review team believes that NNSA and CNS should consider, as part of this re-evaluation, applying the increased seismic loads required by the latest version of DOE Standard 1020 for existing facilities while utilizing more advanced nonlinear analysis techniques, in particular for the 9215 Complex. Such an approach would provide those responsible for re-prioritizing the risk-reduction projects for these facilities a better representation of the risk presented by the 9215 Complex's structural deficiencies.

Conclusion. NNSA presently plans to operate both the 9215 Complex and Building 9204-2E well beyond what was originally predicted during the early stages of the UPF project. In addition, new processing capabilities are being considered for deployment in these existing facilities. With the remaining operational life of these two buildings now approaching the life assumed for new designs, the review team believes that NNSA should consider performing an updated analysis using more accurate nonlinear modeling techniques while applying the requirements of DOE Standard 1020-2012. The current evaluations of the 9215 Complex and Building 9204-2E do not consider the large extension of their operational lifespans and fail to explicitly acknowledge the impact of the lack of structural ductility on each building's design margin, particularly for the 9215 Complex. Site personnel stated their intent to re-evaluate the facility risk reviews in the context of extended lifetime and additional mission capabilities for these facilities. However, the review team learned that this effort is not scheduled for completion until the middle of calendar year 2015 at the earliest.

⁵ These assumptions are documented in the NNSA Production Office-approved Safety Evaluation Reports for the Safety Analysis Report for the 9215 Complex and the Safety Analysis Report for Building 9204-2E.

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Exhibit B

2015 Report from U.S. Department of Energy Inspector General



U.S. Department of Energy
Office of Inspector General
Office of Audits and Inspections

AUDIT REPORT

The Department of Energy's Management of
High-Risk Excess Facilities

DOE/IG-0931

January 2015



Department of Energy
Washington, DC 20585

January 23, 2015

MEMORANDUM FOR THE SECRETARY

FROM: 
Gregory H. Friedman
Inspector General

SUBJECT: INFORMATION: Audit Report on "The Department of Energy's Management of High-Risk Excess Facilities"

BACKGROUND

Fifty years of nuclear weapons production and energy research during the Manhattan Project and the Cold War resulted in thousands of contaminated facilities. Cleaning up and ultimately disposing of these facilities is the responsibility of the Department of Energy. The Department established the Office of Environmental Management (Environmental Management) in 1989 to manage the remediation of its weapons production legacy. As of November 2013, the Department's overall cleanup efforts were projected to cost more than \$280 billion.

In February 2009, Environmental Management identified 292 excess contaminated facilities that met its transfer criteria and indicated that it would accept the facilities when funding became available. Until transferred to Environmental Management, owning programs are responsible for costs associated with maintaining the facilities in a stable condition. Under the *American Recovery and Reinvestment Act of 2009* (Recovery Act), Environmental Management received funding that allowed it to accelerate deactivation and decommissioning (D&D) activities—such as stabilization measures or demolition—at 58 of these facilities, leaving 234 contaminated excess facilities.

In our prior report *Department of Energy's Management of Unneeded Real Estate* (OAS-L-14-07, April 2014), we noted a number of National Nuclear Security Administration facilities in poor condition that were categorized as excess or in shutdown mode without definitive plans for D&D activities. The degradation within these facilities ranged from failures in critical structural components to high levels of contamination. Additionally, several of these facilities posed significant health and safety risks to Department employees and the public. Given the issues identified in that report, and the risks associated with contaminated facilities, we initiated this audit to determine whether the Department has minimized the risk associated with excess contaminated non-Environmental Management facilities.

RESULTS OF AUDIT

Our review found weaknesses in the Department's effort to address the risks associated with its inventory of contaminated facilities. Specifically:

- As of September 2014, a definitive transfer schedule for the 234 contaminated excess facilities awaiting D&D activities had not been established. Although it projected in

2008 that no transfers were expected to occur before 2017, Environmental Management officials have indicated that the transfer date will actually be pushed out to 2025 at the earliest, possibly extending to 2035. Among these facilities are those contaminated with dangerous elements, such as uranium, mercury, and beryllium, constituents that are known to have leached to soil and groundwater during weather-related events.

- Although program offices had taken some actions utilizing Recovery Act and programmatic funding to mitigate the risks posed by the 234 contaminated excess facilities awaiting transfer to Environmental Management, many of these facilities continue to deteriorate and pose increasing risks to mission, workers, the public and the environment.
- Since 2009, program offices had identified at least 140 additional excess contaminated facilities, over and above the 234 already identified, which will need to be addressed by Environmental Management in the future.

According to Department officials, budget realities, including resource constraints and the unstable nature of the budget process, were key to the delays in advancing the D&D program. However, we noted that the Department had not developed a corporate approach for the cleanup and disposition of excess contaminated facilities. Such an approach would assist the Department in addressing high-risk facilities within the vagaries of the annual budget process. In particular, the Department had not implemented a strategic, integrated approach that focused its limited Environmental Management cleanup and mission program budgetary resources on reducing the risk posed by contaminated excess facilities across the complex. Rather, Environmental Management and the various program offices focused their respective budgetary resources based on individual program priorities instead of on the highest risk facilities across the Department. Environmental Management and program offices told us, and we recognize, that they face significant funding constraints as they strive to satisfy the myriad of related mission and regulatory requirements.

Delays in the cleanup and disposition of contaminated excess facilities expose the Department, its employees and the public to ever-increasing levels of risk. While surveillance and maintenance is intended to control these risks, delays in decommissioning and demolition also lead to escalating disposition costs. Further, deferral of tackling these liabilities in a timely manner may affect ongoing mission work, as well as plans to expand and accommodate new missions that are needed to meet energy and national security objectives. Given budget and transfer time line uncertainties identified during this review, as well as the risks posed to health, safety, and the environment, we made recommendations designed to assist the Department in addressing its universe of excess contaminated facilities.

MANAGEMENT RESPONSE

Management concurred with our findings and recommendations and proposed corrective actions to address the issues identified in this report. We consider management's comments and planned corrective actions to be responsive to our findings and recommendations.

Management's comments are included in Appendix 4.

cc: Deputy Secretary
Under Secretary for Nuclear Security
Deputy Under Secretary for Management and Performance
Under Secretary for Science and Energy
Chief of Staff

AUDIT REPORT ON THE DEPARTMENT OF ENERGY'S MANAGEMENT OF HIGH-RISK EXCESS FACILITIES

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THE DEPARTMENT OF ENERGY'S MANAGEMENT OF HIGH-RISK EXCESS FACILITIES

BACKGROUND

Fifty years of nuclear weapons production and energy research in the United States during the Manhattan Project and Cold War generated large amounts of radioactive wastes, spent nuclear fuel, excess plutonium and uranium, thousands of contaminated facilities, and contaminated soil and groundwater. Cleaning up and ultimately disposing of these wastes is the responsibility of the Department of Energy (Department). To oversee the cleanup, the Department established the Office of Environmental Management (Environmental Management) in 1989 to manage the remediation of its environmental legacy. As of November 2013, the Department's overall cleanup efforts were projected to cost more than \$280 billion.

As part of its core responsibilities of cleaning up the Department's environmental legacy, Environmental Management was also assigned responsibility for disposing of excess contaminated facilities and materials owned by other program offices. However, in 2001, with support from the Department's Under Secretary, Environmental Management declared that it would no longer accept additional facilities from other mission programs due to increases in workload, emerging issues, and budgetary constraints, a decision which created a backlog of excess contaminated facilities and materials requiring cleanup. In August 2006, the Department's Deputy Secretary directed Environmental Management to address these additional environmental liabilities, to execute the work, and to incorporate these liabilities into its program plans. As a result, in December 2007, Environmental Management invited the Offices of Science and Nuclear Energy, as well as the National Nuclear Security Administration (NNSA), to nominate excess facilities, wastes and materials for possible transfer to Environmental Management.

Between May and August 2008, Environmental Management conducted walkdowns of more than 300 nominated facilities to determine whether they met transfer criteria, to identify significant project risks and project liabilities, and to develop recommended conditions for transfer. For a facility to be accepted by Environmental Management, it had to be surplus to the Department's mission needs and be "mission contaminated"—having chemical or radioactive contamination, or both, resulting from mission operations. Additionally, the walkdowns identified facility conditions and materials with a greater-than-normal degree of project risk and liability for deactivation and decommissioning (D&D) by Environmental Management.¹ Based on its evaluations, Environmental Management prioritized the acceptance of facilities across the complex for the purpose of providing a basis for requesting necessary budget authority. Prioritization of facilities recommended for transfer was based on factors related to the hazard, risk and regulatory drivers.

In February 2009, Environmental Management issued memorandums to NNSA and the Offices of Science and Nuclear Energy that identified 292 excess contaminated facilities that met its transfer criteria and indicated that it would accept the facilities at a future date when funding

¹Deactivation is the process of placing a contaminated, excess facility in a stable condition to minimize existing risks to workers, the public and the environment. Decommissioning takes a facility to its ultimate end-state through decontamination and dismantlement.

became available. Until funded, the current mission programs were to retain ownership and were responsible for costs associated with maintaining the facilities in a stable condition while awaiting transfer. Under the *American Recovery and Reinvestment Act of 2009* (Recovery Act), Environmental Management received funding that allowed it to complete demolition of 58 of the facilities, leaving 234 contaminated excess facilities to be decommissioned and demolished.

In our prior report *Department of Energy's Management of Unneeded Real Estate* (OAS-L-14-07, April 2014), we noted that a number of NNSA facilities in poor condition were categorized as excess or in shutdown mode without definitive plans for D&D activities. The degradation within these facilities ranged from failures in critical structural components to high levels of contamination. Additionally, several of these facilities posed significant health and safety risks to Department employees and the public. Given the issues identified in that report, and the risks associated with contaminated facilities, we initiated this audit to determine whether the Department has minimized the risk associated with excess contaminated facilities.

EXCESS HIGH-RISK FACILITIES

According to Department officials, issues related to the transfers of non-Environmental Management facilities occurred because of constraints and instability within the Department's budget. However, we noted that the Department had not developed a corporate approach for the cleanup and disposition of excess contaminated facilities. Such an approach would assist the Department in addressing high-risk facilities within the vagaries of the annual budget process. Specifically, we noted the following:

- As of September 2014, a definitive transfer schedule for the 234 contaminated excess facilities awaiting D&D had not been established, other than Environmental Management's 2008 projection, which indicated that no facilities transfers were expected before 2017. Among these facilities are those contaminated with dangerous elements, such as uranium, mercury, and beryllium, constituents that are known to have leached to soil and groundwater during weather-related events.
- Although program offices had taken some actions utilizing Recovery Act and programmatic funding to mitigate the risks posed by the 234 contaminated excess facilities awaiting transfer to Environmental Management, many of these facilities continue to deteriorate and pose increasing risks to mission, workers, the public and the environment.
- Since 2009, program offices had identified at least 140 additional excess mission-contaminated facilities, beyond the 234 already identified, which will need to be addressed by Environmental Management.

The Department had not developed a strategic, integrated approach that focused limited budgetary resources on a risk basis. Program officials with Environmental Management and various program offices identified significant funding constraints and requirements to meet myriad mission and regulatory requirements as impediments to fully addressing D&D needs.

Environmental Management's Schedule

Environmental Management had not established a definitive schedule for the transfer and D&D of the 234 excess contaminated facilities that were identified in 2008. Although it projected in 2008 that no transfers were expected to occur before 2017, Environmental Management officials have indicated that the transfer date will actually be pushed out to 2025 at the earliest, possibly extending to 2035.

Many of the 234 excess contaminated facilities continue to degrade and pose significant risks to workers and surrounding communities. Almost 50 percent of these facilities are more than 50 years old and are becoming dangerous. Several of the facilities are in such disrepair that maintenance and nonessential utilities are limited or discontinued, and access by workers has been prohibited. The longer these facilities remain unaddressed, the further they degrade, and the more dangerous and costly they are to maintain or disposition.

Program Office Risk Mitigation

Program offices have taken some actions to mitigate the risk posed to workers and surrounding communities by excess contaminated facilities. For instance, we found that the offices have spent more than \$380 million in operating and maintenance costs for the 234 facilities since they were evaluated in 2008. Additionally, Recovery Act funding was used to accelerate cleanup efforts for 13 of these facilities. Despite efforts to mitigate risks, significant vulnerabilities remain. According to recent site assessments, additional risk mitigation measures are needed to ensure the protection of workers, the public, environment, and mission. The following sites are examples.

9201-05 Alpha 5 Facility

The 9201-05 Alpha 5 Facility (Alpha 5 Facility) at the Y-12 National Security Complex (Y-12) has been described by NNSA as "the worst of the worst." This facility was built in 1944 and supported a number of missions that used materials such as uranium, mercury and beryllium. Since it ceased operations in 2005, this highly contaminated facility has experienced significant degradation. In particular, during a 2008 Environmental Management assessment, it was noted that the facility had substantial flooding, exterior piping and associated supports were corroding, and reinforced concrete roof panels had deteriorated. The assessment concluded that the combination of the large facility size, rapidly deteriorating conditions, and vast quantity of items requiring disposition made this facility one of the greatest liabilities in the Department's complex. Further compounding the issue, the facility houses a hub of utilities that serves operational production facilities at the site, which could affect national security mission work as further degradation occurs. Since this facility was evaluated in 2008, the site has spent more than \$24 million in operating and maintenance costs.

To accelerate the cleanup effort, Environmental Management provided Recovery Act funding to NNSA to remove a portion of the legacy waste from the Alpha 5 Facility. However, since cleanup efforts were performed, officials informed us that the facility has degraded at an increasingly alarming rate. In particular, a 2014 NNSA site assessment indicated that roof

degradation continues to be widespread throughout the facility with varying levels of severity. This has resulted in significant water intrusion and the spread of radiological and toxicological contamination. Additionally, the assessment identified the potential for an explosion or reaction associated with remaining contaminants and personnel safety issues related to the degraded condition as high-risk areas. Overall, the assessment concluded that this facility presents a high risk to the workers and environment and should not be accepted. The assessment noted that demolition remains the only viable risk accepted standard. Further, it noted that funding will need to be diverted from mission work to prevent the realization of imminent risks and mitigate the consequences of realized risk events.

The following photos compare the Alpha 5 Facility post-Recovery Act cleanup efforts in 2011 to conditions in 2013:



Alpha 5 Facility, post-Recovery Act cleanup effort. (2011)



Facility condition and degradation, including standing water and contaminated equipment. (2013)



Alpha 5 Facility post-Recovery Act cleanup effort. (2011)



Advanced degradation due to roof failures and water intrusion. (2013)

B251 Heavy Element Facility

The B251 Heavy Element Facility at the Lawrence Livermore National Laboratory (LLNL) is described as the most problematic nonmission essential facility at the site. This facility was built in 1956 and was involved in activities associated with underground nuclear testing, as well as research on the nuclear and chemical behavior of heavy elements. Primary isotopes utilized included radioactive materials such as americium, curium, plutonium and radium. All operations of the facility ceased in 1995, and the hazard classification was reduced to radiological in 2005 due to removal of materials. Although the hazard classification was reduced, significant contamination remains in the facility. This building was ranked by Environmental Management, based on its walkdowns conducted in 2008, as one of the top five facilities for priority transfer. Since this facility was evaluated in 2008, the site has spent about \$2.5 million operating and maintenance funds in an effort to stabilize the facility.

Assessments conducted in 2014 by the site indicated that, as a result of the age of the facility and degradation, high-risk areas included catastrophic roof failure above highly contaminated areas; water leakage resulting in electrical fires; water intrusion leading to ground contamination; and contaminated, roof-mounted filtration systems. According to the site's assessment, this facility was identified as presenting an imminent risk to mission, workers, the public and the environment.

The following photos illustrate current roof conditions at the B251 Heavy Element Facility:



Example of standing water on roof.



Improvised roof cap.

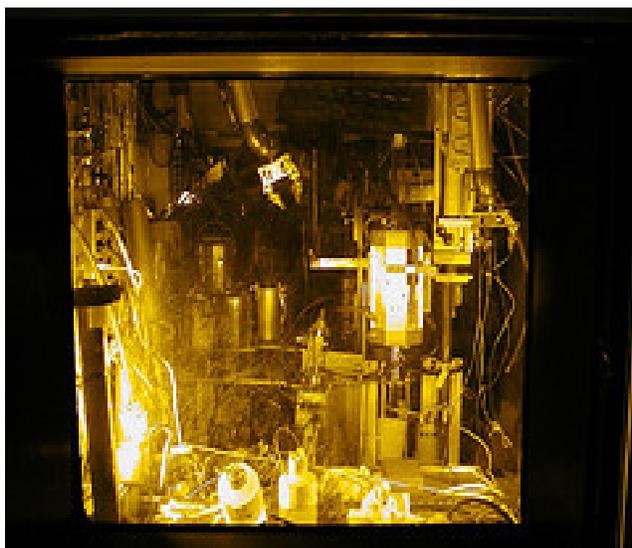
Alpha Gamma Hot Cell Facility

The Alpha Gamma Hot Cell Facility (AGHCF), building 212, is located at the Argonne National Laboratory and has been in operation since 1963. Until programmatic operations ceased in 2007, its operations focused on the examination of irradiated materials, such as plutonium-bearing fuel elements. During the course of operations, a significant volume of transuranic waste accumulated inside the facility. Environmental Management conducted a walkdown of the facility in 2008 and, based on its observations, concluded that from a risk and challenge

viewpoint, clean out of the AGHCF at Argonne National Laboratory should be the top priority among all the reviewed facilities, materials and wastes. Since this facility was evaluated in 2008, the site has spent more than \$19 million in operating and maintenance costs.

According to program officials, some cleanup activities were conducted with Recovery Act funding provided by Environmental Management; however, contamination still remains. In addition, age-related deterioration is prevalent throughout the building and provides for maintenance and operations challenges. Program officials indicated that a recent building condition assessment identified risks associated with the poor condition of the roof; structural deficiencies, to include interior/exterior walls and beams; water intrusion; and electrical equipment. As noted by officials, age-related deterioration and risk areas experienced by the facility can lead to the spread of contamination and issues with maintaining adequate confinement of radiation. Officials indicated that, given the history and the type of work of the AGHCF, aged facility deterioration can lead to loss of control of contamination. In the AGHCF case, a breach could lead to the spread of remote handled hot particle contamination. Officials concluded that this risk will remain until the AGHCF is cleaned out and decontaminated or demolished.

The following photos compare the AGHCF pre-Recovery Act cleanup efforts to conditions in 2013, demonstrating that contaminants are still present in the facility:



Pre-Recovery Act cleanup (August 2009)



Post-Recovery Act cleanup (August 2013)

TA-3-0016 Ion Beam Facility

The TA-3-0016 Ion Beam Facility at Los Alamos National Laboratory (LANL) was built in 1953 to support essential post-World War II scientific research. The facility, which is contaminated with tritium and mixed waste, is over 60 years old and has been vacant for nearly 20 years. In 2001, the facility was assessed by Environmental Management and was recommended for transfer, pending certain cleanup activities. While the 2008 walkdown report showed that these activities had been completed, a recent assessment conducted by the site noted that the structure continues to be the site's highest ranked facility proposed for disposition as a result of ongoing

risk factors. In particular, the radiological facility resides within the most populated technical area at LANL and large components of the facility have tritium contamination that cannot be addressed until the building is taken down. Additionally, the spread of contamination in the event of a wildfire has been identified as a risk at the LANL site as the facility is located in close proximity to a rugged wooded canyon. Since this facility was evaluated in 2008, the site has spent more than \$2.6 million in operating and maintenance costs.

The following photos demonstrate the size of the Ion Beam Facility as well as its close proximity to the wooded canyon and the site's most populated technical area:



Roof maintenance is difficult due to the height of the tower at the Ion Beam Facility.



Illustrates the Ion Beam Facility's proximity to the wooded canyon and the site's most populated technical area.

Additional Facilities for Transfer

Since 2009, program offices had identified at least 140 additional excess mission contaminated facilities, beyond the 234 already identified, that met the criteria for transfer and will need to be addressed by Environmental Management. Of particular concern, we noted that three facilities were identified by LLNL, in a 2014 assessment, as presenting an imminent risk to mission, workers, the public and the environment.

One of the facilities, the B280 Pool Type Reactor, was constructed between 1956 and 1957 to support radiation research. This radioactive and beryllium-contaminated facility ceased operations in 1980 and was approved for demolition in 2007. Since that time, cracks in the reactor shield were observed by site officials in 2010. Following the discovery, the site commissioned an Independent Structural Condition Assessment in 2011, which concluded that the risks associated with the reactor structure included a potential breach of the structure or associated piping that could result in a release of contamination. The report also noted that the reactor shield's design did not meet code due to less than minimum reinforcement, which could further exacerbate the problem. Risks associated with cracking in the shield were reaffirmed in the 2014 site assessment, which indicated that, based on the structural assessment, there was no leading cause or cost-effective stabilization plan for the cracks in the cement reactor shield.

The following photos show examples of cracks in the reactor shielding in the B280 Pool Type Reactor:



For the other two facilities, risks related to roof failures above highly contaminated areas, the potential for release of contaminants from roof-mounted filtration systems, and inaccessible contaminated areas. This is concerning because these facilities are contaminated with materials such as uranium, tritium, beryllium, or a combination of these.

Current Approach Not Fully Successful

The issues we identified occurred because the Department had not developed a corporate approach for cleanup and disposition of excess contaminated facilities. While Environmental Management and the various mission program offices face significant funding constraints in meeting myriad mission and regulatory requirements, the Department had not implemented an approach that focused limited Environmental Management cleanup and mission program budgetary resources on reducing the risk posed by contaminated excess facilities across the complex. Rather, Environmental Management and the various program offices have focused their respective budgetary resources on individual program risks and priorities instead of on the highest risk that exists on a Department-wide basis. Specifically, the Department had not developed a strategic, integrated plan that schedules D&D of excess contaminated facilities and allocates Environmental Management and mission program funding to risk reduction until the D&D is completed.

According to Environmental Management officials, they had been unable to effectively plan for the transfer and D&D of facilities because of its increased workload and budget uncertainties. Additionally, Environmental Management's cleanup work is governed by regulatory agreements and compliance with these agreements is a major cost driver. If the program fails to meet an enforceable regulatory milestone, the Department can be fined. Furthermore, Environmental Management's workload has been affected by unanticipated events. These factors all affect Environmental Management's budget and ultimately affects its ability to provide program offices with a definitive time frame for accepting transfers. In the absence of an Environmental

Management plan for the D&D of these non-Environmental Management facilities, program officials told us that they have been unable to effectively plan for the maintenance and deactivation of excess facilities due to the uncertainty about the length of time they will be required to maintain the facilities. Because Environmental Management has indicated that the date for accepting transfers from other programs will be pushed out from 2017 to 2025 at the earliest, programs must decide whether to accept the risks associated with the facilities until Environmental Management receives additional funding, request additional funding from Congress or take funds away from mission work. As indicated earlier, because programs retain ownership and are responsible for costs associated with maintaining facilities in a stable condition while awaiting transfer, funding decisions regarding the level of maintenance vary depending on transfer time lines.

We concluded that a corporate approach to identifying and scheduling facilities for transfer to Environmental Management for D&D that is integrated with the allocation of Environmental Management and mission program funding for risk reduction is necessary to ensure the effective expenditure of limited budgetary resources and mitigation of risk to the extent practical. In fact, the need for the Department to implement a corporate approach to its environmental remediation approach was previously identified. Specifically, our report *Disposition of the Department's Excess Facilities* (DOE/IG-0550, April 2002) found that the performance of the Department's program to dispose of excess facilities was not fully satisfactory. In particular, we noted that the Department had not fully considered mission requirements, risk reduction, and costs when prioritizing facility disposition activities. Overall, the Department was unable to effectively prioritize facility disposition because it lacked a corporate approach and program offices had not designated sufficient funding for disposition activities.

Management Challenges

In our report *Management Challenges at the Department of Energy* (DOE/IG-0858, November 2011), we suggested that the Department revise its remediation strategy to fund only high-risk activities that threaten health and safety or further environmental degradation. To ensure that risk drives the funding choices, we suggested that the Department should retain a respected outside group, such as the National Academy of Sciences, to rank and rate, on a complex-wide risk/priority basis, the Department's remediation requirements. In response to our report, Congress, through the *National Defense Authorization Act for Fiscal Year 2013*, directed the Assistant Secretary for Environmental Management to provide a briefing to the House Committee on Armed Services on prioritization of environmental cleanup efforts at the Department. The briefing was to include a description of how the Department prioritized cleanup efforts as well as the costs, benefits and challenges of transitioning to the complex-wide risk basis. Environmental Management officials have been unable to provide us with information as to whether this briefing occurred.

Subsequently, in our report *Management Challenges at the Department of Energy Fiscal Year 2013* (DOE/IG-0874, October 2012), we reiterated the series of operational efficiency and cost reduction initiatives offered for management's consideration in our previous year's report, including the need for the Department to reprioritize its environmental remediation efforts. To ensure that our recommendation was fully implemented, Congress, through the *2014 Energy and*

Water Development Appropriations Bill, directed the Department to implement our recommendation regarding reprioritization of cleanup efforts and to provide a report outlining risks at each legacy cleanup site to the Committees on Appropriations of the House of Representatives and the Senate within 1 year following enactment of this Act. According to Environmental Management officials, it has initiated efforts to address this request for excess facilities that have already been transferred to it for D&D.

In our opinion, a current analysis and report providing critical information on contaminated non-Environmental Management excess facilities would be useful to policy makers for decisions regarding the path forward for addressing these facilities. In conjunction with the 2014 Congressionally requested report on the Department's legacy cleanup sites previously mentioned, a comprehensive report on excess contaminated non-Environmental Management facilities could include a Department-wide inventory of excess facilities, the nature of contamination and other safety hazards at each facility, the severity of risk posed to employees and the public, the prioritization for D&D activities, and the estimated costs for D&D activities as well as required maintenance necessary until D&D activities could be scheduled.

Path Forward

Due to delays in the cleanup and disposition of contaminated excess facilities, the Department is taking on ever-increasing levels of risk. In particular, the contaminated facilities highlighted above pose significant health and safety risks to employees and the public and continue to deteriorate, increasing the likelihood of a contaminant release. While surveillance and maintenance is intended to control these risks, delays in decommissioning and demolition lead to escalation of these costs, as well as disposition costs. Further, a number of the facilities are located in areas where there is a realized risk of natural disasters. Finally, deferral of tackling these liabilities in a timely manner may affect ongoing mission work, as well as plans to expand and accommodate new missions that are needed to meet energy and national security objectives.

RECOMMENDATIONS

Given budget and transfer time line uncertainties, as well as the risks posed to health, safety, and the environment, we recommend that the Offices of the Under Secretary for Nuclear Security, Under Secretary for Science and Energy, and Under Secretary for Management and Performance, in conjunction with their stakeholders, take the following actions:

1. Develop an analysis and report providing critical information on contaminated Department excess facilities that would be useful to policy makers for decisions regarding the path forward for addressing these facilities.
2. Based on this analysis, reconsider the current approach for disposition of these facilities to ensure the effective expenditure of limited budgetary resources and mitigation of risk to the extent practical.

MANAGEMENT RESPONSE

Management concurred with the report's recommendations. The Office of the Under Secretary of Management and Performance indicated that it plans to coordinate with the Principal Deputy Administrator for the National Nuclear Security Administration and the Deputy Under Secretary for Science and Energy to sponsor an analysis and report on the Department's contaminated excess facilities, and it intends to evaluate alternatives for the disposition of excess facilities based on this analysis. A working group is planned to be established in January 2015 that will develop milestones for the analysis.

AUDITOR COMMENTS

The Department's planned corrective actions are responsive to our recommendations.

Management's comments are included in Appendix 4.

APPENDIX 1**OFFICE OF ENVIRONMENTAL MANAGEMENT TIME LINE**

| Date | Milestone |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1989 | Office of Environmental Management (Environmental Management) was created to manage the remediation of the Department's environmental legacy, as well as deactivation and disposition of excess contaminated facilities across the complex. |
| 2001 | Assistant Secretary of Environmental Management declared that each Department Program Office including the National Nuclear Security Administration (NNSA) would be responsible for disposition of their excess facilities, wastes, and materials. |
| August 2006 | Deputy Secretary of Energy issued a memorandum mandating that Environmental Management would again hold ultimate responsibility for the Department's excess environmental liabilities. |
| December 2007 | Assistant Secretary of Environmental Management issued an invitation to Department Program Offices and NNSA to propose facilities, wastes, and materials for transfer to Environmental Management for final disposition. |
| January to February 2008 | The Offices of Nuclear Energy (Nuclear Energy) and Science (Science) as well as NNSA submitted transfer candidates. |
| May to August 2008 | Environmental Management conducted walkdown reviews to evaluate acceptability of proposed transfers and generate list of facilities recommended for acceptance. |
| December 2008 to February 2009 | Environmental Management conducted negotiations with NNSA, Nuclear Energy, and Science on the evaluated excess liabilities. In February 2009, the Assistant Secretary of Environmental Management issued memorandums formally documenting facilities, materials and wastes that Environmental Management would agree to accept from NNSA, Nuclear Energy, and Science when funding became available. |
| February 2009 | Congress approved the American Recovery and Reinvestment Act of 2009 (Recovery Act). Environmental Management received \$6 billion in funding. Some Recovery Act funding allowed Environmental Management to cleanup a number of excess liabilities identified in the February 2009 memorandums. |
| FY 2017 | Anticipated start for transferring remaining excess facilities from Nuclear Energy, NNSA, and Science to Environmental Management for final disposition. However, Environmental Management officials have indicated that, due to its increased workload and budget uncertainties, the transfer date has been pushed out to 2025 at the earliest and possibly extending to 2035. |

OBJECTIVE, SCOPE AND METHODOLOGY

Objective

To determine whether the Department of Energy (Department) has minimized the risk associated with excess contaminated facilities.

Scope

We conducted this audit between April 2014 and January 2015. The audit was performed as a continuation of our previously issued report titled, *Department of Energy's Management of Unneeded Real Estate* (OAS-L-14-07, April 2014). The audit was conducted under the Office of Inspector General Project Number A14PT029.

Methodology

To accomplish the audit objective, we:

- Reviewed applicable Federal and Departmental regulations related to the disposition of excess facilities;
- Reviewed Office of Environmental Management (Environmental Management) planning documents and assessment reports related to the audit area;
- Analyzed information related to non-Environmental Management excess contaminated facilities; and
- Interviewed Department officials to determine actions taken to identify and/or mitigate risks associated with excess facilities.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Accordingly, we assessed internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. We assessed performance measures in accordance with the *GPR Modernization Act of 2010* and concluded that the Department had established performance measures related to the audit area. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. Finally, we did not rely on computer-processed data to achieve our audit objective and, therefore, did not conduct a full reliability assessment of computer-processed data.

Management waived an exit conference.

PRIOR REPORTS

- Audit Report on [*Department of Energy's Management of Unneeded Real Estate*](#) (OAS-L-14-07, April 2014). The audit determined that the Department of Energy (Department) had a number of controls in place to manage the disposition of Department-owned real estate properties. However, the report identified a number of National Nuclear Security Administration facilities in poor condition that were categorized as excess or in shutdown mode without definitive plans for deactivation and decommissioning activities. The degradation within these facilities ranged from failures in critical structural components to high levels of contamination. Additionally, several of these facilities posed significant health and safety risks to Department employees and/or the public.
- Audit Report on [*The Department of Energy's Office of Environmental Management's Budget Allocation Process*](#) (OAS-L-12-03, March 2012). The audit found that the Office of Environmental Management had implemented a risk-based process to manage and plan for declining budget allocations that incorporated the myriad factors that must be considered in making difficult budgetary decisions. The report noted that although the Office of Environmental Management's current annual budget planning process appeared to be adequate to address the nearly 5 percent decline in budget allocations tested, more extensive reductions could put future regulatory and agreement milestones at risk.
- Special Report on [*Management Challenges at the Department of Energy*](#) (DOE/IG-0858, November 2011). This report suggested that the Department revise its remediation strategy to fund only high-risk activities that threaten health and safety or further environmental degradation. To ensure that risk drives the funding choices, we suggested that the Department should retain a respected outside group, such as the National Academy of Sciences, to rank and rate, on a complex-wide risk/priority basis, the Department's remediation requirements.
- Audit Report on [*Disposition of the Department's Excess Facilities*](#) (DOE/IG-0550, April 2002). The audit found that the performance of the Department's program to dispose of excess facilities was not fully satisfactory. In particular, we noted that the Department had not fully considered mission requirements, risk reduction and costs when prioritizing facility disposition activities.

MANAGEMENT COMMENTS



Department of Energy

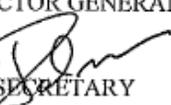
Washington, DC 20585

December 19, 2014

MEMORANDUM FOR RICKEY R. HASS

DEPUTY INSPECTOR GENERAL
FOR AUDITS AND INSPECTIONS
OFFICE OF INSPECTOR GENERAL

FROM:

DAVID M. KLAUS 
DEPUTY UNDER SECRETARY
FOR MANAGEMENT AND PERFORMANCE

SUBJECT:

Department of Energy Management Response to Inspector
General Draft Audit Report on *"The Department of Energy's
Management of High-Risk Excess Facilities"*

The Department of Energy (DOE) respects the findings and recommendations of the Inspector General (IG) in its subject report and agrees with the two primary recommendations as stated below:

1. Develop an analysis and report providing critical information on contaminated Department excess facilities that would be useful to policy makers for decisions regarding the path forward for addressing these facilities.
2. Based on this analysis, reconsider the current approach for disposition of these facilities to ensure the effective expenditure of limited budgetary resources and mitigation of risk to the extent practical.

The Deputy Under Secretary for Management and Performance, in cooperation with the Principal Deputy Administrator for the National Nuclear Security Administration (NNSA) and the Deputy Under Secretary for Science and Energy, will sponsor the preparation of the recommended analysis and report. The analysis will leverage teams and processes from two recent reviews: the National Laboratory Operations Board assessment of the active general purpose infrastructure at the National Laboratories and plants and NNSA's most recent annual review of its high-risk excess facilities.

The Department, through the National Laboratory Operations Board, will charter a working group by January 2015; the working group will establish deadlines for the analysis and the completion of the report.

As part of the report resulting from Recommendation #1, alternatives for the disposition of these excess facilities will be evaluated.



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Office of Inspector General (IG-12)
Department of Energy
Washington, DC 20585

If you want to discuss this report or your comments with a member of the Office of Inspector General staff, please contact our office at (202) 253-2162.

Exhibit C

May 2017 Letter from Defense Nuclear Facilities Safety Board

Sean Sullivan, Chairman
Bruce Hamilton, Vice Chairman
Jessie H. Roberson
Daniel J. Santos
Joyce L. Connery

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



May 11, 2017

The Honorable Frank G. Klotz
Administrator
National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Administrator Klotz:

The annual reporting requirement regarding the safety of Y-12's 9212 Complex established by our March 13, 2007, letter to the NNSA Administrator is terminated. The Y-12 extended life program and associated safety strategy mitigates the risks associated with aging infrastructure. The program has many positive aspects that may be worth replicating at other defense nuclear sites.

The attached staff report is provided for your information and use.

Sincerely,

A handwritten signature in black ink, appearing to read "Sean Sullivan", written over a white background.

Sean Sullivan
Chairman

Enclosure

c: Mr. Joe Olencz

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

March 16, 2017

MEMORANDUM FOR: S. A. Stokes, Technical Director

COPIES: Board Members

FROM: R. Oberreuter

SUBJECT: Y-12 National Security Complex Extended Life Program Safety Strategy

Members of the Defense Nuclear Facilities Safety Board's (Board) staff conducted a review of the safety strategy [1] for the Y-12 National Security Complex (Y-12) extended life program (ELP) for Building 9204-2E and the 9215 Complex. The staff team conducted the on-site review November 9–10, 2016. The staff team discussed additional lines of inquiry with Consolidated Nuclear Security, LLC (CNS) and National Nuclear Security Administration (NNSA) Production Office (NPO) personnel via teleconference on November 30, 2016, and January 18, 2017.

The Board's staff review team found the initiatives taken by CNS and NPO in documenting key safety basis-related assumptions, decisions, and scheduled activities to be a positive step. As a living document, the ELP safety strategy will continue to evolve to provide additional specificity and refinement regarding the planned evolution of the 9215 Complex and Building 9204-2E safety bases. In its review of the safety strategy, the staff team identified the following areas as requiring further development: facility structures, nuclear criticality safety, and confinement.

Background. In 2014, NNSA reduced the planned operational scope of the Uranium Processing Facility (UPF) project [2]. As a result, certain uranium processing operations, such as component fabrication, assembly, disassembly, and surveillance, will remain in the existing 9215 Complex and Building 9204-2E for at least 25 more years (through 2040 for the 9215 Complex and beyond 2040 for Building 9204-2E).

On January 28, 2016, CNS issued a report with recommendations [3] for extending the operational lives of the 9215 Complex and Building 9204-2E, built in the 1950s and late 1960s respectively. The report recommended performing requirements gap analyses in parallel with continuing risk reduction initiatives intended to reduce material at risk (MAR) inventories to near "just-in-time" levels. In these gap analyses, CNS investigated gaps between the current capabilities of the facilities and modern requirements, and recommended closing gaps in the areas of safety basis (including confinement), natural phenomena hazards design, fire protection,

and electrical systems. NPO and the Y-12 contractors historically had accepted these gaps, in part, because the facilities were assumed to have limited operational lives and would eventually be replaced by UPF.

NPO directed CNS to “develop a safety strategy for NPO approval which identifies the scope, priority, and actions required to execute the proposed risk reductions and resolve any gaps in meeting applicable requirements captured in the ELP Report” on April 14, 2016 [4], and on June 30, 2016, CNS issued the safety strategy. On August 31, 2016, the NNSA Chief of Defense Nuclear Safety issued a memo to the NPO Assistant Manager for Nuclear Safety and Engineering containing advice regarding approval of the ELP safety strategy [5]. NPO sent a letter to CNS approving the ELP safety strategy on September 1, 2016, [6].

Department of Energy Requirements. Department of Energy (DOE) Order 420.1C, *Facility Safety*, contains programmatic requirements (e.g., nuclear criticality safety) that are applicable to all DOE nuclear facilities, as well as facility requirements (e.g., nuclear safety design criteria) applicable to new facilities and major modifications to existing facilities. The safety strategy states that while the existing safety bases for the ELP facilities “were prepared consistent with” the previous revision of the order, DOE Order 420.1B, CNS used the *programmatic* requirements from DOE Order 420.1C, along with its associated guides and standards, to identify key regulatory gaps to address in the ELP. The safety strategy also compares the capabilities of Building 9204-2E and the 9215 Complex with certain DOE Order 420.1C *facility* requirements. The CNS safety strategy [1] identified the following notable gaps to DOE Order 420.1C requirements:

Safety Controls—“Safety-SSCs [structures, systems, and components] and safety software must be designed to perform their safety functions when called upon” (DOE Order 420.1C, Attachment 2, Chapter I, section 3.b(6)). The 9215 Complex facility structure cannot withstand certain design basis events commensurate with its safety-significant designation.

Nuclear Criticality Safety—“Criticality safety evaluations must show that entire processes involving fissionable materials will remain subcritical under normal and credible abnormal conditions, including those initiated by design basis events” (DOE Order 420.1C, Attachment 2, Chapter III, section 3.f). Criticality safety evaluations for both Building 9204-2E and 9215 Complex processes cannot demonstrate that processes remain subcritical following certain design basis events.

Confinement—“Hazard category 1, 2, and 3 nuclear facilities with uncontained radioactive materials...must have the means to confine the uncontained radioactive materials to minimize their potential release in facility effluents during normal operations and during and following accidents, up to and including design basis accidents (DBAs)...An active confinement ventilation system [is] the preferred design approach for nuclear facilities with potential for radiological release. Alternate confinement approaches may be acceptable if a technical evaluation demonstrates that the alternate confinement approach results in very high assurance of the confinement of radioactive materials” (DOE Order 420.1C, Attachment 2, Chapter I, section 3.b(3)). Neither Building 9204-2E nor the 9215 Complex have active confinement ventilation

systems, and CNS has not performed analyses to demonstrate the facility structures can provide high assurance of confinement of radioactive materials.

Staff Team Review. The Board’s staff review team found the initiative taken by CNS and NPO in documenting key safety basis-related assumptions, decisions, and scheduled activities to be a positive step. As a living document, the ELP safety strategy will continue to evolve to provide additional specificity and refinement regarding the planned evolution of the 9215 Complex and Building 9204-2E safety bases. In its review of the safety strategy, the staff team identified the following areas as requiring further development: facility structures, nuclear criticality safety, and confinement.

Facility Structures—The 9215 Complex facility structure cannot withstand certain design basis events commensurate with its safety-significant designation as discussed in the safety strategy [1]. This is contrary to DOE Order 420.1C (as well as DOE Order 420.1B), which requires safety controls “be designed to perform their safety functions when called upon.” In the safety strategy, CNS proposed to perform structural reanalysis of Building 9204-2E and, if necessary, upgrade the facility to meet seismic design category (SDC)-2 requirements commensurate with a new safety-significant facility structure. At that time, per the safety strategy, CNS would only consider identifying practicable upgrades to the 9215 Complex and would not attempt to demonstrate that it could meet SDC-2 performance requirements.¹

Subsequent to issuing the safety strategy, CNS enlisted a panel of structural engineering experts to walk down the ELP facilities and provide recommendations for future analyses and upgrades. The expert panel recommended reanalysis of both the 9215 Complex and Building 9204-2E, and suggested that it may be possible to upgrade both facilities to meet SDC-2 requirements. During the staff’s on-site review of the safety strategy, CNS personnel indicated that they intended to pursue the path recommended by the expert panel. The staff team is encouraged by this change in approach. Combined with near-term actions to aggressively reduce facility MAR, the approach represents an appropriate strategy to address this requirements gap. The staff team suggested CNS add discussion of the reanalysis and potential upgrades to the next safety strategy revision to codify the path forward. The staff team plans to review these efforts as they progress. The outcome of the reanalysis and potential upgrades could have significant bearing on resolving additional requirements gaps.

Nuclear Criticality Safety—DOE Order 420.1C, Attachment 2, Chapter 3, states: “Criticality safety evaluations must show that entire processes involving fissionable materials will remain subcritical under normal and credible abnormal conditions, including those initiated by design basis events.” This programmatic requirement applies to both existing facilities and new facilities. The safety strategy indicates that nuclear criticality safety analyses are unable to demonstrate that processes remain subcritical following certain design basis events in both the 9215 Complex and Building 9204-2E. During the review, the staff team learned that the design basis events of concern are those for which the post-event configuration of the facility structures would be unknown. These events include natural phenomena events, aircraft impacts, and large

¹ CNS viewed Building 9204-2E as the more structurally sound of the two facilities and therefore a likelier candidate to bring into compliance with modern structural requirements, whereas CNS viewed the 9215 Complex as being either impossible or very costly to bring into compliance.

fires that overwhelm the fire suppression systems and cause significant structural damage. CNS has not conducted quantitative analyses of Building 9204-2E and the 9215 Complex to predict the structural configuration following such events. CNS criticality safety analysts therefore assume that nuclear materials could be affected in such a way as to make criticality accidents credible.

In the safety strategy approved by NPO on September 1, 2016, CNS recommends that NNSA continue to accept this regulatory gap. The staff team questioned this decision given that DOE Order 420.1C requires processes be evaluated to ensure subcriticality following credible design basis events. During a follow-up teleconference with CNS and NPO personnel, CNS personnel indicated that following the planned structural evaluations that are part of the ELP, CNS analysts will use the updated quantitative analyses to determine specific criticality safety vulnerabilities and identify potential compensatory measures. These criticality safety analyses are anticipated to begin in the 2020 timeframe. CNS personnel intend to update the ELP safety strategy to reflect this path forward and submit it to NPO for approval.

When the staff team asked if CNS or NPO were considering near-term compensatory actions, CNS personnel pointed to ongoing MAR reduction activities as providing a reduction in overall facility hazard. While the staff team acknowledges that reducing MAR reduces hazards, it does not fundamentally address the need to demonstrate that processes remain subcritical following design basis events. Overall, the staff team agrees with the approach proposed by CNS: short of deinventorying the facilities, the direct path toward improving the post-design basis criticality safety of Building 9204-2E and the 9215 Complex will involve pursuing natural phenomena analyses, structural analyses, criticality vulnerability studies, and targeted upgrades. The sequential nature of these activities makes the anticipated 2020 timeframe for updated criticality safety analyses reasonable. The staff team finds that updating the safety strategy to reflect this revised approach would represent a significant improvement in CNS and NPO's path forward for addressing the potential for post-design-basis event criticalities in these facilities. The staff team will evaluate the long term acceptability of this strategy once CNS has completed the analyses and identified intended structural upgrades.

Confinement Ventilation—Neither Building 9204-2E nor the 9215 Complex have active confinement ventilation systems, and both facilities would face loss of passive confinement capability following certain design basis events as discussed in the safety strategy [1]. In the safety strategy, CNS proposed re-performing confinement technical evaluations (originally performed in response to Board Recommendation 2004-2, *Active Confinement Systems*) using planned just-in-time material inventories and updated facility lifetimes. However, the means by which CNS will demonstrate that the facilities maintain confinement following design basis events remained unclear.

During the review, the staff team learned that CNS intends to use revisions to the Recommendation 2004-2 confinement technical evaluations as the vehicle for determining whether and/or how the ELP facilities provide very high assurance of confinement. The staff team plans to review the technical evaluations when they are available. The staff team notes, however, that the success of this approach is largely contingent on demonstrating the facilities'

structures are able to survive design basis events and, if an active confinement capability is not added, demonstrating the structures can provide a passive confinement function.

Conclusion. The Board's staff review team is encouraged by the initiative taken by CNS and NPO in documenting key safety basis-related assumptions, decisions, and scheduled activities. As a living document, the ELP safety strategy will continue to evolve to provide additional specificity and refinement regarding the planned evolution of the 9215 Complex and Building 9204-2E safety bases. The staff team believes that CNS and NPO should continue to pursue reanalysis and upgrade of the ELP facility structures, as well as improved strategies for addressing post-design basis event criticality scenarios and providing confinement of radioactive materials.

References

- [1] Consolidated Nuclear Security, LLC, *Safety Strategy for the Extended Life Program, Buildings 9204-2E and 9215*, June 2016.
- [2] UPF Red Team, *Final Report of the Committee to Recommend Alternatives to the Uranium Processing Facility Plan in Meeting the Nation's Enriched Uranium Strategy*, April 15, 2014.
- [3] Consolidated Nuclear Security, LLC, *Extended Life Program Buildings 9204-2E and 9215*, January 2016.
- [4] Beausoleil, G.L., Manager, National Nuclear Security Administration Production Office, Letter to W.C. Tindal, Vice President and Y-12 Site Manager, Consolidated Nuclear Security, LLC, April 14, 2016.
- [5] Roberson, J.L., Chief of Defense Nuclear Safety, National Nuclear Security Administration, Memorandum to K.A. Hoar, Assistant Manager of Nuclear Safety and Engineering, National Nuclear Security Administration Production Office, August 31, 2016.
- [6] Ivey, K.D., Safety Basis Approval Authority, and C. McFall, Associate Deputy Manager for Operations Y-12, National Nuclear Security Administration Production Office, Letter to A.S. Boser, Director Y-12 Engineering, Consolidated Nuclear Security, LLC, September 1, 2016.

Exhibit D

June 2017 Letter from Defense Nuclear Facilities Safety Board

Sean Sullivan, Chairman
Bruce Hamilton, Vice Chairman
Jessie H. Roberson
Daniel J. Santos
Joyce L. Connery

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



June 26, 2017

The Honorable Frank G. Klotz
Administrator
National Nuclear Security Administration
U.S. Department of Energy
100 Independence Avenue, SW
Washington, DC 20585-0701

Dear Administrator Klotz:

The Defense Nuclear Facilities Safety Board (Board) has been reviewing the design of the Uranium Processing Facility (UPF), and in particular, the safety strategies being employed. Members of the Board's staff conducted a review of the Preliminary Safety Design Report as the project prepares to enter final design. This letter constitutes our project letter at this phase of design.

The enclosure describes opportunities for improvement related to the UPF safety strategy for fire protection. We will continue to follow the National Nuclear Security Administration's efforts to integrate safety into the design as the UPF project proceeds through design and construction.

Sincerely,

A handwritten signature in black ink, appearing to read "Sean Sullivan", written over a light blue horizontal line.

Sean Sullivan
Chairman

Enclosure

c: Mr. Joe Olencz

Enclosure

The Uranium Processing Facility (UPF) Preliminary Safety Design Report and Preliminary Fire Hazards Analysis contain the latest project safety strategy. Review by members of the Board's staff found weaknesses in the revised fire safety strategy resulting from the elimination of thermal barriers and deficiencies in compliance with industry codes and standards. The staff review team identified the following three opportunities for improvement:

Fire Suppression System (FSS) Safety Classification—The UPF FSS is not classified as a safety system, but the UPF design relies on it to prevent accidents with the highest unmitigated consequences. These accidents include a large facility fire and a nuclear criticality accident that follows a design basis seismic event. The project's original strategy included thermal barriers to prevent a criticality accident by protecting fissile material from a post-seismic fire. The project has since eliminated most thermal barriers from the UPF design, thereby increasing the importance of the FSS in preventing a criticality accident. The Board's staff team believes that, given the FSS's increased contribution to the safety posture of the facility, it would be prudent to designate the FSS as safety-significant. Upgrading the FSS to a safety-significant designation would require the FSS to be designed, procured, and maintained in accordance with American Society of Mechanical Engineers NQA-1, *Quality Assurance Requirements for Nuclear Facility Applications*, and would require surveillance of this system to be conducted under Technical Safety Requirements. This increased rigor will increase confidence that the FSS can perform its required safety functions during and following design basis accidents.

FSS Diesel Pumps Limit State Designation—The UPF FSS pumps are credited as seismic design category (SDC)-2, limit state B. According to American Nuclear Society Standard 2.26-2004, *Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design*, a limit state B designation will not guarantee functionality of deformation-sensitive equipment, such as a fire pump, after the design basis seismic event (SDC-2). Thus, functionality of the FSS after the design basis seismic event cannot be guaranteed. During the review by the Board's staff team, project personnel stated that although the FSS pumps are designated limit state B, the project would test them to the more stringent limit state D requirements. However, the Board's staff team reviewed the UPF project pump testing specification, which invokes commercial testing requirements, and found that the pumps would only be tested to SDC-2, limit state B, loading levels. Testing these pumps to limit state D as suggested by UPF project personnel would improve confidence in their ability to perform their safety function.

Combustible Glovebox Windows—Gloveboxes that will contain material-at-risk (MAR) serve as the primary confinement boundary for UPF and are designed in accordance with DOE Order 420.1C, *Facility Safety*. The DOE Order requires applying industry consensus standards to the design and fabrication of gloveboxes. National Fire Protection Association 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*, and American Glovebox Society G010, *Standard of Practice for Glovebox Fire Protection*, require the use of

non-combustible glovebox windows. However, the UPF project plans to use a combustible material without demonstrating fire performance equivalent to non-combustible materials. In addition, the currently specified material for glovebox windows could melt when exposed to fire, resulting in a breached primary confinement. Either using a non-combustible window material or demonstrating that the material selected by the UPF project provides equivalent performance would improve the reliability of the facility's primary confinement for MAR.