UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF)
) Docket No. 72-1051
HOLTEC INTERNATIONAL)
) October 23, 2019
(Consolidated Interim Storage Facility)
Project))

SIERRA CLUB'S MOTION TO FILE A NEW LATE-FILED CONTENTION

Comes now Sierra Club and in support of this Motion to File Late-Filed Contention, states as follows:

1. On September 23, the Nuclear Waste Technical Review Board (NWTRB) issued a report titled *Preparing for Nuclear Waste Transportation*. That report raises new issues that were not addressed in Holtec's Environmental Report (ER). The new information in the report is materially different from information previously available.

2. More specifically, the NWTRB report concludes that transportation of nuclear waste cannot be technically accomplished within the 40-year period of the initial license Holtec is seeking. The waste from high burnup fuel exacerbates this problem. The NWTRB report states that if spent nuclear fuel was repackaged from large casks and canisters into smaller standardized canisters, the SNF from all nuclear power plants could be removed by 2070. If there is no repackaging some of the largest canisters containing the hottest spent nuclear fuel would not be cool enough to meet transportation requirements until 2100. The NWTRB report also cites unresolved issues regarding transportation infrastructure, damage to the waste containers during shipment, and the need for new designs for containers in which the transport the waste. The NWTRB report

comprehensively identifies 18 technical issues affecting all spent nuclear fuel and high level waste and all scenarios.

3. Holtec's ER does not consider the technical issues as presented in the NWTRB report. The ER assures the NRC and the public that transportation of the waste during the first 20 years of operation of the proposed CIS will be safe. Contrary to that assertion, the NWTRB report shows that the technical challenges with transporting the waste will not be adequately addressed within the initial licensing period.

4. The new Contention 30 satisfies the three-prong test in 10 C.F.R. § 2.309(c)(10-(iii), as follows:

(i) The information upon which the filing is based was not previously available. The NWTRB report was issued on September 23, 2019. This was the first authoritative discussion from any source of the technical issues discussed in the report.

(ii) The information upon which the filing is based is materially different than information previously available. The NWTRB report presents an analysis that has not been undertaken prior to the review upon which the report is based. As shown in Contention 30, the information in the NWTRB report is materially different than the information presented in the Holtec ER.

(iii) The filing has been submitted in a timely fashion based on the availability of the subsequent information. Contention 30 is being filed within 30 days of the issuance of the NWTRB report, upon which the Contention is based. This has been held to be a timely filing. *Shaw AREVA MOX Services*, 67 NRC 460 (2008).

WHEREFORE, Sierra Club requests permission, pursuant to 10 C.F.R. § 309(c), to file Contention 30 as a late-filed contention.

ısı Wallace L. Taylor

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CERTIFICATE OF SERVICE

Pursuant to 10 C.F.R. § 2.305, I certify that, on this date, copies of Sierra Club's Motion to File a New Late-Filed Contention, Contention 30, and Attachment were served upon the Electronic Information Exchange (the NRC's E-Filing System) in the above captioned proceeding.

s Wallace L. Taylor

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CONTENTION 30

10 C.F.R. § 72.108 requires that the ER submitted by a license applicant must evaluate the potential impact on the environment of the transportation of the nuclear waste. A report issued by the DOE's Nuclear Waste Technical Review Board (NWTRB) identifies 18 technical issues regarding transportation of nuclear waste. These issues remain unresolved and pose barriers to the implementation of the Holtec CIS project. The issues identified in the NWTRB report are not discussed in Holtec's ER. The ER therefore does not adequately evaluate the environmental impact of the transportation of the nuclear waste from various reactor sites to the proposed CIS facility.

Basis for Contention

Holtec intends to transport spent nuclear fuel and high level radioactive waste, primarily by rail, to the proposed CIS facility in Lea County, New Mexico. The ER, now Revision 6, submitted by Holtec states that 100,000 MTU will be transported to and stored at the CIS facility in the first 20 years after a license is issued. A recent report issued on September 23, 2019, by the DOE's Nuclear Waste Technical Review Board has concluded that there are technical issues that will make the transportation of nuclear waste to the proposed Holtec CIS facility in the 20-year time frame infeasible. The ER is therefore inadequate in discussing and evaluating the environmental impact of the transportation of the nuclear waste being transported to the CIS facility.

Facts Upon Which Petitioner Intends to Rely In Support of This Contention

10 C.F.R. § 72.108 requires that the ER submitted by a license applicant must evaluate the potential impact on the environment of the transportation of the nuclear waste. "The ER should present a detailed and thorough description of each affected resource for evaluation of potential impacts to the environment." *Environmental Review Guidance for Licensing Actions Associated With NMSS Programs*, NUREG-1748, p. 6-1. In this case the ER has not presented a "detailed and thorough description" regarding the environmental impacts of the proposed CIS project. Section 3.9 of the ER discusses transportation issues, but it simply describes the highway and railroad infrastructure that exists or would be needed to transport the waste. It does not describe the time and expense of upgrading the infrastructure as addressed in the NWTRB report. There is no discussion of the technical adequacy of the containers in which the waste would be transported. Section 3.12 of the ER discusses public health and safety issues, but there is no reference in that section to public health and safety related to the transportation of the waste. Public health and safety must be adequately discussed in an ER. NUREG-1748, *supra*, and as previously noted, 10 C.F.R. § 72.108 requires the ER to evaluate the potential impact on the environment of the transportation of the nuclear waste.

Section 4.9 of the ER discusses the environmental impacts related to transportation of the waste. This discussion primarily relies on a modeling exercise conducted using the RADTRAN modeling program. As will be discussed in more detail below, there are technical issues that have not been addressed in the RADTRAN modeling.

A recent report issued on September 23, 2019, by the Nuclear Waste Technical Review Board, *Preparing for Nuclear Waste Transportation* (NWTRB report)(report is attached), identifies 18 technical issues regarding transportation of nuclear waste that are not addressed or discussed in the Holtec ER. The critical determination from that report is as follows:

DOE has examined the trend in SNF dry storage at nuclear power plant sites (Williams 2013). On average, during 2004-2013, the nuclear utilities discharged SNF that has higher burnups (approximately 45 Gwd/MTU) than previously discharged SNF and, therefore, is thermally hotter and more radioactive. In addition, the nuclear utilities are loading SNF into larger dry-storage casks and canisters to improve operational efficiency and reduce cost. The largest of these

canisters now holds as many as 37 PWR assemblies or 89 BWR assemblies. As a result, these larger casks and canisters are hotter than earlier dry-storage casks and canisters; therefore, they will take longer to cool sufficiently to meet transportation requirements.

DOE estimated that if SNF was repackaged from large casks and canisters to smaller standardized canisters (and using standard assumptions about the operating lifetime of the U.S. fleet of nuclear reactors), DOE could remove SNF from all nuclear power plant sites by approximately 2070. However, if no repackaging occurs, some of the largest SNF canisters storing the hottest SNF would not be cool enough to meet the transportation requirements until approximately 2100 (Williams 2013).

NWTRB report, p. 77. In other words, assuming a license is issued to Holtec in 2021, there is no likely scenario under which the waste destined for the Holtec CIS facility could be transported to the facility in the 20-year time frame proposed by Holtec, or even within the initial 40-year licensing period. These facts are not discussed or addressed in the sections of the ER cited above.

Robert Alvarez, an expert on nuclear waste, has reviewed the NWTRB report and has issued a declaration discussing the implications of the report as they relate to the Holtec project. Mr. Alvarez's declaration and his CV are attached. Mr. Alvarez begins with four conclusions:

• With about a third of the world's spent power reactor fuel (SNF), the magnitude of long-distance transport of spent nuclear fuel and high-level radioactive waste in the United States is unprecedented.

• Concerns surrounding the integrity of high-burnup spent nuclear fuel in dry storage are not resolved and may result in prolonged onsite storage for several decades.

• There is a substantial lack of data regarding potential damage of SNF during transport.

• Repackaging SNF for transport and disposal is an important missing element that has a major impact on the timing and implementation of a national SNF transportation program.

With respect to Mr. Alvarez's first conclusion, the NWTRB report, at p. 37, notes that although there has been some experience transporting small quantities of nuclear waste for long distances, there is no experience with transporting large quantities (thousands of metric tons) of waste. As the NWTRB said, "However, transporting large quantities of SNF and HLW has not been done and will require significant planning and coordination." NWTRB report, p. xxii. Thus, transportation of the large quantity of waste contemplated by Holtec would be unprecedented and there is no assurance at this point that transportation of that quantity of waste could be done safely in the time period that would allow the waste to be transported on the schedule proposed by Holtec. As Mr. Alvarez points out in his declaration, for example, new transportation casks will have to be developed for licensing, a process that would take at least 10 years, and that inspection equipment and procedures will have to be developed to inspect the containers storing the waste now in dry storage. The ER does not address these issues.

Mr. Alvarez's second point concerns problems involving transportation of high burnup fuel. The NWTRB report, p. 77-79, discusses the issue of transporting high burnup fuel. The report states:

A simple (and expected) example of a condition outside the limits of a CoC is a case in which the SNF cask or canister has not been cooled for the minimum time required by the CoC. In this case, the licensee will allow more time for the SNF to cool before attempting to transport the cask or canister holding the SNF. However, this approach will lead to delays in the removal of SNF from some nuclear power plant sites, . . .

The NWTRB report then goes on to discuss the minimum burnup versus the initial enrichment, referred to as the loading curve. The report points out that the loading curve and what is called the burnup credit have not been addressed for newer, larger-capacity dry storage casks and canisters. This issue must be addressed before the waste can be transported to a CIS.

Specifically relevant to the Holtec project, the NWTRB report uses the Holtec HI-STAR 100 transportation cask as an example. The accompanying graph shows that many of the Holtec canister assemblies are not acceptable for transportation. The report concludes that the conditions that do not meet the requirements for transportation must be addressed and corrected before the waste can be transported.

Mr. Alvarez also addresses the problem of repackaging in order to transport high burnup fuel. As noted at the outset, if the fuel is repackaged into smaller containers the nuclear waste would not be removed from the nuclear power plant sites until approximately 2070. NWTRB report, p. 77. And repackaging the waste will be expensive and time-consuming. As Mr. Alvarez says in his declaration, a repackaging facility would have to be developed and constructed, which would cost hundreds of millions of dollars or more and take decades to complete. Development of such a facility would also require significant advance planning. The additional cost and delay to accommodate repackaging would not allow the waste to be transported to the Holtec CIS facility on the schedule contemplated by Holtec.

There does not appear to be any discussion of issues related to the transportation of high burnup fuel in the Holtec ER. The ER is therefore inadequate regarding transportation issues. Mr. Alvarez's third conclusion is that there is a substantial lack of data regarding potential damage to the nuclear waste during transport. The NWTRB report, p. 38, explains, for example:

No comprehensive examinations of U.S. commercial SNF have been conducted following transportation to determine if the SNF was damaged in transit. However, SNF handling, loading, and shipping operations can subject the SNF assemblies to vibration loads, small impulse loads (e.g., bumps in the road), and, in severe conditions such as an accident, strong shock loads. How these vibrations and impulse loads may affect the SNF and its ability to meet transportation requirements are not fully understood, but they are the subject of ongoing DOE research.

Another issue related to damage of the waste during shipment is the condition of the infrastructure over which the waste would be transported. The report, p.44, states that "at some sites, significant work will have to be done to bring the transportation infrastructure back into good working order." Addressing this problem will also take time and money, further impacting the schedule for transporting the waste to the Holtec CIS.

The Holtec ER has not addressed this undetermined issue. Transportation of the nuclear waste to the Holtec facility should not be licensed until the implications of possible damage to the waste during shipment is adequately determined. The ER is inadequate in not addressing this issue.

In light of the new information set forth above, another area of deficiency in the ER must be discussed. An ER must describe any mitigation measures that would avoid or minimize the environmental impacts of the project. *Environmental Review Guidance for Licensing Actions Associated With NMSS Programs*, NUREG-1748, §6.5, citing 40 C.F.R. § 1502.14 (f). The U.S. Supreme Court has found that agencies have an obligation to discuss the extent to which adverse impacts may be avoided, along with those impacts that cannot. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 109 S.Ct. 183

(1989). The court added that inclusion of a reasonably complete discussion of possible mitigation measures serves NEPA's "action forcing" function.

CEQ's NEPA regulations define "mitigation" as measures to avoid, minimize, rectify, reduce, or compensate for environmental impacts. 40 C.F.R. § 1508.20. The mitigation measures discussed must cover the range of impacts of the proposal. The measures must include such things as design alternatives that would decrease pollution emissions, construction impacts, and other possible efforts. CEQ, "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," March 1981, Questions 19a and b.

In this case mitigation would include repackaging the waste into smaller containers, particularly with respect to high burnup fuel, as discussed above. As Mr. Alvarez explained in his declaration, the nuclear fuel cladding under high burnup conditions may not be relied upon as a primary barrier to prevent the escape of radioactivity, especially during prolonged dry storage. More specifically, Mr. Alvarez raised the following concerns:

• fuel cladding thickness is reduced to form a hydrogen-based rust of the zirconium metal which can cause the cladding to become brittle and fail;

• increased pressure between the pellets and the inner wall of the cladding causes the cladding to thin and elongate;

• high burnup fuel temperatures make it more vulnerable to damage from handling and transport; removal from the pool, vacuum drying and emplacement in canisters can result in cladding failure. These are impacts that must be avoided or minimized by repackaging the fuel in smaller containers. Such mitigation measures will, as set forth in the NWTRB report, require extra cost and delay in transporting the waste to the Holtec CIS facility. The NWTRB report, p. 69, also discusses mitigation measures in undertaking the repackaging process. The report says, "Regardless of the repackaging capabilities developed for use, the impacts of repackaging on the SNF assemblies will have to be evaluated and factored into the future transportation, interim storage, and disposal of the SNF." The ER is deficient in not discussing these mitigation issues.

The impacts of transportation of the nuclear waste are an integral part of the licensing process for the Holtec CIS facility. 10 C.F.R. § 72.108 clearly states that the ER must evaluate environmental issues related to transportation. The recently released NWTRB report raises significant issues regarding transportation of nuclear waste that must be adequately addressed in the Holtec ER, but are not.