

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

IN THE MATTER OF)	
)	Docket No. 72-1051
HOLTEC INTERNATIONAL)	
)	May 4, 2020
(Consolidated Interim Storage Facility)	
Project))	

SIERRA CLUB'S MOTION TO REOPEN THE RECORD

Comes now Sierra Club and in support of this Motion to Reopen the Record, states as follows:

1. On October 23, 2019, Sierra Club filed a new late-filed Contention 30, based on a September 23, 2019, report from the Nuclear Waste Technical Review Board, regarding issues related to the transportation of nuclear waste.

2. When Contention 30 was filed, the Atomic Safety and Licensing Board decision rejecting all of Sierra Club's then existing contentions had been appealed to the Commission on June 3, 2019, and the ASLB record was closed.

3. On April 23, 2020, the Commission issued a ruling on Sierra Club's appeal. In that ruling the Commission remanded Contention 30 to the ASLB, stating, "Therefore, we remand Sierra Club's proposed Contention 30, including the issue of whether the reopening standards are met, to the Board." So, the Commission clearly considered the reopening of the record a viable issue which the Board must now determine.

4. 10 C.F.R. § 2.326 sets forth the requirements for reopening the record: (1) A motion to reopen must be timely; (2) the motion must address a significant safety or environmental issue; and (3) the motion must demonstrate that a materially different

result would be or would have been likely had the newly proffered evidence been considered initially. The motion must also be accompanied by an affidavit. An affidavit supporting this motion is hereto attached.

5. Sierra Club's Contention 30 was filed within 30 days of the issuance of the NWTRB report that forms the basis of the contention. This has been held to be a timely filing. *Shaw AREVA MOX Services*, 67 NRC 460 (2008); *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)*, 76 NRC 491, 499 (2012). The NWTRB report is new information that was not available prior to its issuance. Although it refers to prior information, it is a technical review of the current status of the challenges facing the transportation of nuclear waste.

6. Transportation of nuclear waste is a significant and relevant issue regarding safety and environmental issues in the licensing of a nuclear waste storage facility. That is why 10 C.F.R. § 72.108 requires that a nuclear waste storage facility must be evaluated with respect to the potential impact on the environment and public health and safety of the transportation of the nuclear waste. The importance of the NWTRB report is that it is the first authoritative report to conclude that the nuclear waste contemplated to be stored at the Holtec facility could not be transported in the 20-year time frame proposed by Holtec, or even within the initial 40-year licensing period. No prior report or source had established this fact.

7. If the NWTRB report and the declaration of Robert Alvarez, submitted with Sierra Club's Contention 30, had been available when the ASLB record was open, the contention would have been admitted for further consideration. If the waste could not be

safely transported any time during the licensing period, that is certainly an issue that is within the scope of the proceeding and material to the findings the NRC must make to support the action involved in the proceeding and would constitute an admissible contention.

8. Pursuant to the ruling of the Commission, this motion is submitted to cure any alleged procedural defects asserted by Holtec or the NRC Staff, although the Commission has implicitly rejected those allegations.

WHEREFORE, Sierra Club requests that the record be opened in this case, pursuant to 10 C.F.R. § 2.326, in order to determine the admissibility of Sierra Club Contention 30.

/s/ *Wallace L. Taylor*

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Pursuant to 10 C.F.R. § 2.305, I certify that, on this date, copies of Sierra Club's Motion to Reopen the Record were served upon the Electronic Information Exchange (the NRC's E-Filing System) in the above captioned proceeding.

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AFFIDAVIT OF WALLACE L. TAYLOR

Wallace L. Taylor, under oath, declares as follows:

1. I am the attorney for Sierra Club in this proceeding. I personally prepared Sierra Club Contention 30. In preparing Contention 30 I reviewed the Nuclear Waste Technical Review Board report that forms the basis of Contention 30, as well as the declaration of Robert Alvarez, submitted in conjunction with Contention 30.

2. This affidavit is submitted to comply with the requirements of 10 C.F.R. § 2.326(b) in support of Sierra Club's Motion to Reopen the Record. The criteria in 10 C.F.R. § 2.326(a) are satisfied as set out hereafter.

3. The motion is timely because Contention 30 is based on the Nuclear Waste Technical Review Board report, *Preparing for Nuclear Waste Transportation*, that was issued on September 23, 2019. Contention 30 was filed on October 23, 2019, within 30 days after the NWTRB report was issued. This has been held to be a timely filing. *Shaw AREVA MOX*, 67 NRC 460 (2008); *Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), 76 NRC 491, 499 (2012). Even though the NWTRB report refers to previous sources, the analysis and conclusions in the report are new. The Report was prepared for and presented to Congress and the Department of Energy as a new analysis

and new information on which Congress and DOE could rely. A prospective intervenor is not required to scour every possible source, no matter how old, for information and then try to craft a contention from that information. There is no way that could be done in the 60-day period permitted to intervene after the license application is accepted for review. The NWTRB report, as the most recent analysis of the transportation challenges with nuclear waste, was new information not previously available.

4. The NWTRB report addresses significant environmental and safety issues. The report identifies 18 technical issues regarding transportation of nuclear waste that are not addressed 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 were not discussed or addressed in the Holtec ER as explained in Contention 30.

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 were attached to Contention 30. 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, p. 79, 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.

Therefore, Sierra Club’s Motion to Reopen the Record raises significant safety and environmental issues.

5. Contention 30 would likely have been admissible if considered initially when the record was open. Pursuant to 10 C.F.R. § 2.309(f), a petitioner’s contentions must: (1) provide a specific statement of the issue of law or fact to be raised or controverted; (2) provide a brief explanation of the basis for the contention; (3) demonstrate that the issue raised in the contention is within the scope of the proceeding; (4) demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding; (5) provide a concise statement of the alleged facts or expert opinions which support the petitioner’s position on the issue and on which the petitioner intends to rely at hearing, together with reference to specific sources and documents on which the petitioner intends to rely; (6) provide sufficient information to show that a genuine dispute exists with the licensee on a material issue of law or fact.

These criteria are met in this case. Contention 30 states the specific issue of law or fact being raised. The issue is the failure of the Holtec ER to address the 18 technical issues in the NWTRB report, the issues raised by Robert Alvarez in his declaration, and the fact that transportation of nuclear waste is not feasible during the 40-year period of the license Holtec is seeking.

Contention 30 provides an explanation for the basis of the contention, referring to the NWTRB report and the statements and opinions of Robert Alvarez. Contention 30 discusses issues related to transportation of the nuclear waste to the Holtec CIS facility. 10 C.F.R. § 72.108 clearly states that transportation issues are within the scope of this proceeding and are material to the decision the NRC must make.

Contention 30 presents a thorough statement of the facts and expert opinions supporting the contention. Contention 30 cites to relevant portions of the NWTRB report and explains how those portions of the report are relevant and significant to the issues in this proceeding. Contention 30 also explains the contents and relevance of Robert Alvarez' expert declaration as it relates to the issues in the NWTRB report. Mr. Alvarez's points, explained in full in his declaration, are:

- 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.

Finally, Contention 30 shows a genuine dispute on a material issue of law or fact. The contention points out the places in the Holtec ER that are at odds with the NWTRB report or where the ER does not adequately discuss the issues raised in the NWTRB report. The contention also emphasizes that the conclusion in the NWTRB report that nuclear waste cannot be feasibly transported within the time frame of the proposed Holtec license is at odds with the Holtec proposal and with the very concept of the license the NRC is being asked to issue.

Based on the foregoing I believe that the requirements of 10 C.F.R. § 72.326 for reopening the record have been met. I also believe this affidavit and Sierra Club's Motion to Reopen the Record satisfy the Commission's order of remand issued on April 23, 2020.

I certify under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated this 4th day of May, 2020.


WALLACE L. TAYLOR