BEFORE THE UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF	)	
	)	Docket No. 72-1050
HOLTEC INTERNATIONAL	)	
	)	
(Consolidated Interim Storage Facility Project)	)	September 14, 2018

PETITION TO INTERVENE AND REQUEST FOR ADJUDICATORY HEARING BY SIERRA CLUB

INTRODUCTION

Holtec International (Holtec) proposes to construct a consolidated interim storage (CIS) facility in Lea County, New Mexico. Pursuant to 10 C.F.R. Part 72, Holtec has applied to the Nuclear Regulatory Commission (NRC) for a license to construct and operate the facility. The facility would store highly radioactive spent nuclear fuel, high level waste and greater than Class C waste from nuclear reactors around the country. The nuclear waste would be stored in metal canisters placed in the ground at the facility site.

Concurrently with the application for a license, Holtec has submitted an environmental report (ER) and a safety analysis report (SAR). Radioactive waste would be transported to the CIS site by rail or truck from various reactor sites around the country. The transportation and storage of the radioactive waste as proposed by Holtec

creates risks and adverse impacts that form a basis for denying the license to construct and operate the facility.

The storage and disposal of spent radioactive fuel from nuclear reactors is a problem that has no good solution. Sierra Club believes that all reasonable alternatives must be evaluated given the desirability of avoiding unnecessary dangers and risks associated with CIS. As the United States Court of Appeals for the District of Columbia Circuit observed:

> Even though it is no longer useful for nuclear power, SNF [spent nuclear fuel] poses a dangerous, long-term health and environmental risk. It will remain dangerous "for time spans seemingly beyond human comprehension." Nuclear Energy Inst., Inc. v. EPA, 373 F.3d 1251, 1258 (D.C. Cir. 2004)(per curiam). Determining how to dispose of the growing volume of SNF, which may reach 150,000 metric tons by the year 2050, is a serious problem.

New York v. NRC, 681 F.3d 471, 474 (D.C. Cir. 2012).

Compounding this problem is that, realistically, there is no assurance that a permanent repository for nuclear waste will ever be found. Therefore, an "interim" storage facility as proposed by Holtec may very likely become a permanent repository, without the protections that would be required of a permanent repository.

Based on the foregoing, Sierra Club requests that the NRC deny the license application submitted by Holtec in this proceeding.

STANDING

Pursuant to the Atomic Energy Act (AEA), the Commission must grant a hearing in a licensing proceeding "upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding." 42 U.S.C. § 2239(a)(1)(A). To support the request, a petitioner must provide the Commission with information regarding "(1) the nature of the petitioner's right under the governing statutes to be made a party; (2) the nature of the petitioner's property, financial, or other interest in the proceeding; (3) the possible effect of any decision or order on the petitioner's interest." Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station), 60 N.R.C. 548, 552 (2004)(citing 10 C.F.R. § 2.309(d)(1). "The NRC generally uses judicial concepts of standing in interpreting this regulation." Entergy Nuclear Vermont Yankee, 60 N.R.C. at 552. Thus, a petitioner may intervene if it can specify facts showing "that (1) it has suffered or will suffer a distinct and palpable harm constituting injury-in-fact within the zone of interests arguably protected by the governing statutes, (2) the injury is fairly traceable to the action being challenged, and (3) the injury will likely be redressed by a favorable determination." Id. at 552-553.

In determining whether a petitioner has met the requirements for establishing standing, the Commission "construe[s] the petition in favor of the petitioner." Id. at 553.

Member organizations such as Sierra Club may intervene on behalf of their members if they can "demonstrate that the licensing action will affect at least one of [their] members, . . . identify that member by name and address, and . . . show that [they are] authorized by that member to request a hearing on his or her behalf." In cases involving reactors, members of an organization who live within 50 miles of the reactor have presumptive standing. Although the 50-mile presumption does not necessarily apply to non-reactor cases, a proximity presumption for non-reactor sites does extend to those areas where the "proposed action involves a significant source of radioactivity producing an obvious potential for offsite consequences." Georgia Inst. of Tech. (Georgia Tech Research Reactor, Atlanta, Georgia), CLI-95-12, 42 NRC 11, 116-117 (1995). The appropriate distance for proximity standing is decided on a case-by-case basis "taking into account the nature of the proposed action and the significance of the radioactive source."

The decision in Shaw Areva MOX Services, LBP-07-14 (2007) is instructive. That case involved a license application for a mixed oxide fuel fabrication facility in

South Carolina. The petitioners in that case submitted affidavits from members whose residences were within 20-32 miles from the facility site. The licensing board decision noted that the NRC Staff included residents as far away as 50 miles from the facility in its calculation of potential population doses. The Shaw decision also suggests that a significant proximity radius is justified in cases involving large amounts of spent nuclear fuel, citing Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant), LBP-99-25, 50 NRC 25 (1999).

Further support for the declarants' standing in this case is provided by the Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, Volume I, found at www.energy.gov/nepa/downloads/eis-0250-final-environmental-impact-statement. In that document, 3.1.8, the Department of Energy states that the the region of influence for public health and safety is 80 km, or 50 miles. So the health and safety of anyone living within 50 miles of the repository site was at risk. That same assumption applies in this case. And an unprotected storage facility without the protections of a geologic repository, storing 3 times the quantity of

radioactive waste as Yucca Mountain, should have at least the same presumption of risk within 50 miles.

The declarations of Martha Singleterry, Ed and Patty Hughs, Jimi Gadzia, Gordon Dyer, Deana Dyer, Danielle Dyer and Danny Berry are hereto attached to establish standing for Sierra Club in this proceeding. The declarants live or have property interests in Eddy County and Lea County, New Mexico, or adjacent to a railroad that will be the primary route for the radioactive waste coming into New Mexico. The ER submitted by Holtec includes both counties in the Region of Influence (ROI) when discussing and evaluating the socioeconomic impacts of the CIS project. ER at 3.8.5 and 4.8.4. Therefore, any Sierra Club member who is a resident of those counties would have sufficient proximity to the CIS site to confer standing. Furthermore, the ER at 2.4.2 cites alleged political support from the citizens of Eddy County and Lea County, New Mexico. Therefore, anyplace in those counties is within the proximity zone for being affected by the CIS facility and conferring standing on Eddy County and Lea County residents. Finally, as noted in the Shaw decision, the quantity of radioactive waste is significant. Here, the ultimate plan to store 100,000 tons of radioactive waste is unprecedented.

LEGAL STANDARDS GOVERNING LICENSE APPLICATIONS

Consideration of the license application in this proceeding is purportedly governed by 10 C.F.R. Part 72. The application must also comply with the Nuclear Waste Policy Act (NWPA), 42 U.S.C. §§ 10101 et seq. The problem is that neither Part 72 nor the NWPA authorize a CIS as proposed by Holtec. The NWPA authorizes either an independent spent fuel storage installation (ISFSI) only at a reactor site, 42 U.S.C. § 10152, or a monitored retrievable storage facility operated by the Department of Energy (DOE), 42 U.S.C. § 10161.

10 C.F.R. Part 72 defines an ISFSI as a complex designed and constructed for the interim storage of spent fuel, either at the reactor site or at the site of another facility. So, even if that definition could be stretched to include a CIS as proposed by Holtec, it would be contrary to the limits of the authorization set forth in the NWPA. Part 72 defines a monitored retrievable storage (MRS) installation as a complex designed, constructed and operated by DOE. Therefore, the CIS proposed by Holtec could not be an MRS facility.

Assuming for the sake of commenting on the Holtec application that Part 72 applies in this case, § 72.30 requires an applicant for a license to build and operate an ISFSI to provide reasonable assurance that funds will be

available to decommission the ISFSI. The application must also be accompanied by an environmental report that complies with 10 C.F.R. Part 51.

STANDARD FOR ADMISSIBILITY OF CONTENTIONS

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.

The NRC has made clear that the burden on a petitioner in stating its contentions is not heavy. In Dominion Nuclear Conn., Inc. (Millstone Nuclear Power Station, Units 2 & 3), CLI-01-24, 54 NRC 349, the NRC described the contention

admissibility standards as "insist[ing] upon some 'reasonably specific factual and legal basis' for the contention." Id., 54 349,359. The NRC further explained in Millstone that the standards for contention admissibility were meant to prevent contentions based on "little more than speculation" and intervenors who had "negligible knowledge of nuclear power issues and, in fact, no direct case to present." Id. at 358. Rather, petitioners are required only to 'articulate at the outset the specific issues they wish to litigate." Id. at 359.

The NRC and the courts have also made clear that the burden of persuasion is on the licensee, not the petitioner. The petitioner only needs to "com[e] forward with factual issues, not merely conclusory statements and vague allegations." Northeast Nuclear Energy Company, 53 NRC 22, 27 (2001). The NRC described the threshold burden in stating a contention as requiring a petitioner to "raise any specific, germane, substantial, and material factual issues that are relevant to the . . . request for a license . . . and that create a basis for calling on the [licensee] to satisfy the ultimate burden of proof." Id.

Courts have found, however, that this threshold burden may not be appropriate where the information was in the hands of the licensee or NRC staff and was not made

available to the petitioner. See, e.g., York Comm. for a Safe Env't. v. NRC, 527 F.2d 812, 815 n. 12 (D.C. Cir. 1975) (where the information necessary to make the relevant assessment is "readily accessible and comprehensible to the license applicant and the Commission staff but not to petitioners, placing the burden of going forward on petitioners appears inappropriate."). Also, in Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 554 (1978), the United States Supreme Court affirmed the NRC in finding that the proper standard to apply required intervenors to simply make a "showing sufficient to require reasonable minds to inquire further," a burden the NRC found to be significantly less than that of making a prima facie case.

The ASLB in the Yucca Mountain case observed:

> The Commission therefore amended its rules to require that contentions have "at least some minimal factual and legal foundation in support." That is all. That is what DOE agreed at oral argument is the standard. As the Commission emphasized in Oconee, the contention requirements were never intended to be turned into a "fortress to deny intervention."

U.S. Dept. of Energy (High Level Waste Repository, LBP-09-06 (May 11, 2009).

PETITIONER'S CONTENTIONS AND SUPPORTING INFORMATION

CONTENTION 1

The NRC has no authority to license the Holtec CIS facility under the NWPA nor the AEA. Holtec has said DOE

must take title to the waste, but the NWPA does not authorize DOE to take title to spent fuel in an interim storage facility. The AEA has no provision for licensing a CISF.

Basis for Contention

The application submitted by Holtec assumes that the Department of Energy (DOE) will take ownership of the spent fuel to be stored at the Holtec site. ER at 1.0. In addition, the proposed license submitted by Holtec with its application contains provision 17, which assumes DOE will take title to the waste as follows:

> In accordance with 10 C.F.R. 72.22, the construction program will be undertaken only after a definitive agreement with the prospective user/payer for storing the used fuel (USDOE and/or a nuclear plant owner) HI-STORE CIS has been established. Construction of any additional capacity beyond this initial capacity amount shall commence only after funding is fully committed that is adequate to construct such additional capacity.

In addition, 10 C.F.R. § 72.22(e) requires Holtec to disclose information as to its financial ability to undertake the proposed project. Pursuant to that requirement, Holtec submitted as part of its application Financial Assurance and Project Life Cycle Cost Estimates (Accession No. ML18058A608). On page 3 of that document Holtec states:

> Additionally, as a matter of financial prudence, Holtec will require the necessary user agreements in place (from the USDOE and/or the nuclear plant owners) that will justify the required capital expenditures by the Company. However, if the NRC approves and the necessary contractual instruments are established

> insuring the minimum revenue stream needed to justify the facility, then Holtec will launch the construction using its own resources so as to bring the interim storage solution to the industry in the shortest possible time.

Holtec representatives have also made public statements showing Holtec's intention that DOE must take title to the radioactive waste before Holtec will begin to construct the proposed CIS facility. An article in the SpentFuel newletter of August 7, 2015 (copy attached as Ex. 1), referring to comments from Holtec Vice President Pierre Oneid, said:

> Oneid explained, in response to a question about who will hold title to the spent fuel, that the title issue needs to be worked out but Holtec's vision is that DOE would sign a contract with Holtec to be the customer, and thus DOE would take title to the fuel at the reactor site and be responsible for transporting it to the storage facility, just as it would if DOE were sending the spent fuel to a permanent repository. Holtec is working with DOE, in parallel to its licensing work, to start discussions with DOE about this issue.

Holtec Vice President Joy Russell, in January of 2016 conducted a PowerPoint presentation about Holtec's plans for the CIS facility. Slide 39 (copy attached as Ex. 2) in that presentation said Holtec "Requires federal funding to construct and operate CISF." Also, in the July 30, 2015 issue of World Nuclear News (copy attached as Ex. 3) Holtec Vice President Pierre Oneid was quoted as saying, "We will surely soon have official talks with them [DOE] on a contract whereby the DOE will hold title to the fuel."

Finally, the Land Purchase Option Agreement between Holtec and the Eddy-Lea Energy Alliance (ELEA), a copy of which is attached as Ex. 4, in Paragraph E under Recitals, states:

> It is Holtec's intend [sic] to obtain a license from the Nuclear Regulatory Commission (the "NRC") and upon successful completion of an agreement with the Department of Energy and/or one or more utility companies to store spent nuclear fuel, construct and operate the HI_STORM UMAX system on the property (the "Project").

All of the foregoing statements by Holtec and its representatives clearly show that Holtec intends for DOE to take title to the waste. Because the intent is for DOE to take title to the waste, the NWPA, not the AEA, controls the NRC's authority to license the proposed CIS facility. However, the NWPA does not provide for the DOE to take ownership of spent fuel in interim storage facilities.

In fact, the NWPA does not even contemplate an interim storage facility away from the reactor site. 42 U.S.C. § 10151, setting forth the findings and purposes of interim storage, repeatedly refers to storage at the reactor site.

The ER does not describe what the agreement with DOE would entail, so it is impossible for Sierra Club, other intervenors, and the public to know to what extent the arrangement will be in violation of the NWPA. It will require intervention and discovery to obtain this

information. In fact, the NRC should require that this information be provided.

The AEA does not have any provision for licensing a storage facility. The AEA's licensing section, 42 U.S.C. § 2133, specifically authorizes the NRC to license only utilization and production facilities. This does not include nuclear waste storage facilities.

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

The NWPA governs the disposal of nuclear waste. Section 111 of the NWPA, 42 U.S.C. § 10131(a)(5), specifically states that the federal government will not take ownership of spent fuel until it is received at a permanent repository. That section says:

> The generators and owners of high-level radioactive waste and spent nuclear fuel have the primary responsibility to provide for, and the responsibility to pay the costs of, the interim storage of such waste and spent fuel until such waste and spent fuel is accepted by the Secretary of Energy in accordance with the provisions of this Act.

Furthermore, Section 123 of the NWPA, 42 U.S.C. § 10143, provides that "[d]elivery, and acceptance by the Secretary [of Energy], of any high-level radioactive waste or spent nuclear fuel for a repository . . . shall constitute a transfer to the Secretary of title to such waste or spent fuel." (emphasis added). Also, Section 202 of the NWPA, 42 U.S.C. § 10222(a)(5)(A), requires DOE to "take

title" to spent fuel only "following commencement of operation of a repository."

A repository is defined in the NWPA as:

> any system licensed by the Commission that is intended to be used for, or may be used for, the permanent deep geologic disposal of high-level radioactive waste and spent nuclear fuel, whether or not, such system is designed to permit the recovery, for a limited period during initial operation, of any materials placed in such system. Such term includes both surface and subsurface areas at which high-level radioactive waste and spent nuclear fuel handling activities are conducted.

42 U.S.C. § 10101(18). It is clear, therefore, that an interim storage facility as Holtec proposes is not a permanent repository and DOE cannot take ownership of the waste.

To further confirm that DOE ownership of the waste does not apply to a CIS as proposed by Holtec, the NWPA repeatedly refers to interim storage of nuclear waste as storage at the reactor site. 42 U.S.C. § 10151 et seq. The only exception is that DOE can take no more than 1,900 tons of waste on an emergency basis if space is not available at a reactor. 42 U.S.C. § 10151(a)(3). Since the Holtec proposal is to take an initial amount of 5,000 tons of waste and eventually to store 100,000 tons is clearly more than 1,900 tons, DOE cannot take title.

The NWPA also provides for what it calls monitored retrievable storage (MRS). 42 U.S.C. § 10161. It is clear

from the language of that section that DOE would be the owner and operator of any MRS facility. That section also states that the generators and owners of the waste would be responsible for the costs of storage at the MRS facility.

The illegality of a CIS facility is further highlighted by the fact that a bill is currently being considered in Congress, H.R. 3053, to amend the NWPA to make CIS legal. If CIS were legal, there would be no need for this legislation.

Therefore, the NWPA precludes development of the Holtec CIS facility and the NRC should not issue a license.

Nor does the AEA give the NRC authority to license an ISFI away from the site of a reactor. The licensing provisions of the AEA, 42 U.S.C. § 2133, states:

> The Commission is authorized to issue licenses to persons applying therefor to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use import, or export under the terms of an agreement for cooperation arranged pursuant to section 123, utilization or production facilities for industrial or commercial purposes.

This section clearly limits the NRC's licensing authority to utilization and production facilities.

42 U.S.C. § 2014 defines "production facility" as follows:

> (1) any equipment or device determined by rule of the Commission to be capable of the production of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public; or (2) any important component part especially

> designed for such equipment or device as determined by the Commission. Except with respect to the export of a uranium enrichment production facility, such term as used in Chapters 10 and 16 shall not include any equipment or device (or important component part especially designed for such equipment or device) capable of separating the isotopes of uranium or enriching uranium in the isotope 235.

The definition of "utilization facility," pursuant to § 2014, is:

> (1) any equipment or device, except an atomic weapon, determined by rule of the Commission to be capable of making use of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public, or peculiarly adapted for making use of atomic energy in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public; or (2) any important component part especially designed for such equipment or device as determined by the Commission.

Obviously, neither of these definitions include a nuclear waste storage facility. Therefore, the AEA provides no authority for the NRC to license the Holtec project.

CONTENTION 2

The Holtec environmental report, in attempting to describe the purpose and need for this project, claims that CIS is safer and more secure than storing the waste at the reactor site. However, the environmental report cites no evidence or data to support this assertion. An agency cannot rely on self-serving statements, especially ones with no supporting data, from the prime beneficiary of the project.

Basis for Contention

An environmental report (ER) supporting a license application must contain a statement of the purposes of the

proposed action. 10 C.F.R. § 51.45(b). In its statement of purpose and need, Holtec contends that the CIS proposed by Holtec would be safer and more secure than storing the waste at a reactor site. ER at 1.2. However, the ER provides absolutely no data or evidence to support that statement of enhanced safety. The NRC cannot blindly accept the unsupported statements of the license applicant.

NRC Guidance, Environmental Review Guidance for Licensing Actions Associated With NMSS Programs, NUREG-1748 (Accession No. ML032450279), states:

> The applicant/licensee should explain why the proposed action is needed. This section of the ER describes the underlying need for the proposed action and should not be written merely as a justification of the proposed action, nor to alter the choice of alternatives.

Id. at § 6.1.1.

The statement in the ER that simply makes a conclusory statement that storage at the Holtec site would be safer than storage at the reactor site does not comply with the NRC guidance quoted above.

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

The purpose and need statement under the National Environmental Policy Act (NEPA) is important because the purpose and need statement "necessarily dictates the range of 'reasonable' alternatives." Carmel-by-the-Sea v. U.S. Dep't. of Transp., 123 F.3d 1142 (9th Cir. 1997). The

definition of purpose and need must be reasonable. Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190 (D.C. Cir. 1991). There is no way to know if the statement of purpose and need is reasonable unless it is supported by data and evidence.

Furthermore, the agency must not accept out of hand the applicant's statement of purpose and need. In ELPC v. NRC, 470 F.3d 676, 683 (7th Cir. 2006), quoting Simmons v. Corps of Engineers, 120 F.3d 664, 666 (7th Cir. 1997), the court said:

> We have held that blindly adopting the applicant's goals is a "losing proposition" because it does not allow for the full consideration of alternatives required by NEPA. NEPA requires an agency to "exercise a degree of skepticism in dealing with self-serving statements from a prime beneficiary of the project" and to look at the general goal of the project rather than only those alternatives by which a particular applicant can reach its own specific goals.

The ER and subsequent EIS must examine the relative safety of HOSS at reactor sites in order to substantiate the purpose and need for the Holtec project. HOSS has been described as follows:

> An array of vertical-axis dry-storage modules at a center-to-center spacing of perhaps 25 meters. Each module would be on a concrete pad slightly above ground level, and would be surrounded by a concentric tube surmounted by a cap, both being made of steel and concrete. This tube would be backed up by a conical mound made of earth, gravel and rocks. Further structural support would be provided by triangular panels within the mound, buttressing the tube. The various structural components would be tied together

> with steel rods. Air channels would be provided, to allow cooling of the dry-storage module. These channels would be inclined, to prevent pooling of jet fuel, and would be configured to preclude line-of-sight access to the dry-storage module.

Dr. Gordon Thompson, Robust Storage of Spent Nuclear Fuel: A Neglected Issue of Homeland Security (2003)(Accession No. ML042220007), p. 64. Dr. Thompson's report documents the benefits of HOSS.

In addition, Dr. Thompson explains why an away-from-reactor storage site would be less safe than on-site storage:

> However, three factors affect the overall risk of interim storage. First, shipment to an away-from-reactor ISFSI would increase the overall transport risk, because fuel would be shipped twice, first from the reactor site to the ISFSI, and then from the ISFSI to the ultimate repository. Second, an away-from-reactor ISFSI would hold a comparatively large inventory of spent fuel, creating a potentially attractive target for an enemy. Third, there is a risk that a large, away-from-reactor ISFSI would become, by default, a permanent repository, despite having no long-term containment capability. These three factors must be considered in minimizing the overall risk of interim storage.

Id. at 59.

At this point, until an environmental impact statement (EIS) is prepared by the NRC, the statement of purpose and need in the ER is inadequate.

CONTENTION 3

The statement in the ER that CIS is safer and more secure than storage at a reactor site contradicts the NRC's Continued Storage Rule, which concludes that spent

radioactive fuel can be safely stored at a reactor site indefinitely. Therefore, there is no basis for accepting the statement in the ER, and there is no purpose and need for the Holtec project.

Basis for Contention

The Continued Storage Rule, 10 C.F.R. § 51.23, incorporates the findings contained in an EIS, NUREG-2157 (ML14196A105). In NUREG-2157, the NRC concluded that the environmental impacts of storage of spent fuels at the reactor site for an indefinite period of time were almost uniformly small. If radioactive spent fuel can be stored at a reactor site as concluded by the NRC in NUREG-2157, there is no need to risk the transportation and storage of the waste at a CIS site as proposed by Holtec. Therefore, Holtec, contrary to NEPA, has not established a purpose and need for the CIS project.

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

As discussed in the previous contention, Holtec alleges that storage of radioactive waste is safer and more secure at a CIS than at a reactor site. ER at 1.2. However, the NRC's Continued Storage Rule, 10 C.F.R. § 51.23, incorporates an EIS, NUREG-2157, that concluded that storage at a reactor site for an indefinite period would generally result in only small environmental impacts. NUREG-2157, p. 4-97 – 4-98.

Clearly, if spent fuel can be safely stored at the reactor site indefinitely, there is no purpose and need for the CIS proposed by Holtec. Moreover, there are increased risks from the CIS facility due to the risks of transporting the waste to the CIS site and the increased risk of so much waste being stored in one place.

In addition, all of the statements and facts in support of Contention 2 are incorporated in support of this Contention.

Therefore, according to the NRC in its Continued Storage Rule, there is no benefit from or need for a CIS as proposed by Holtec.

CONTENTION 4

Operation of the CIS site as proposed by Holtec would necessitate the transportation of the radioactive waste from reactor sites to the CIS facility. Transportation from the reactors to the CIS site carries substantial risks. These risks must be evaluated in the ER.

Basis for Contention

10 C.F.R. § 72.108 states that a nuclear waste storage facility must be evaluated with respect to the potential impact on the environment of the transportation of the radioactive waste. The containers destined for the Holtec CIS facility will be transported from various reactors around the country to the Holtec site. There is a risk of radiation being emitted from the containers during shipment.

The ER must address the environmental impacts of these risks. The ER, 4.9, as submitted, does not adequately address these risks.

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

In November 2010, the American Public Health Association (APHA) called spent fuel transportation "a national public health threat that is largely preventable." American Public Health Association, Intrastate and Interstate Transportation of Spent Nuclear Fuel is a Public Health Risk, November 9, 2010, found at www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/09/08/12/intrastate-and-interstate-transportation-of-spent-nuclear-fuel-is-a-public-health-risk. APHA advocated for long-term fuel storage at reactors until a permanent repository is developed. In reviewing the APHA report, Amy Hagopian, a professor of global health at the University of Washington said, "The potential hazards and risks are huge, so minimizing transport makes sense. It just takes one accident, and then everyone will be pointing fingers and asking how we got to this point." Jennifer Weeks, Managing Nuclear Waste, CQ Researcher, January 28, 2011, found at library.cqpress.com/cqresearcher/document.php?id=cqresrre2011012800.

A report by Matthew Lamb and Marvin Resnikoff identified the consequences of a severe rail accident involving shipments of radioactive waste. Matthew Lamb and Marvin Resnikoff, Radiological Consequences of Severe Rail Accident Involving Spent Nuclear Fuel Shipments to Yucca Mountain: Hypothetical Baltimore Rail Tunnel Fire Involving SNF, September, 2001, found at www.state.nv.us/nucwaste/news2001/nn11459.htm. That study was based on the circumstances of a fire that occurred on a freight train traveling through Baltimore. The study calculates what the impacts would be if such an incident occurred on a train carrying radioactive waste.

The report calculates the radiation exposure data if only one spent fuel cask is on the train as shown in the following table:

	Exposure to Baltimore Residents
Affected Population, 1990 (2000)	390,388 (345,493)
Area With Acute Dose of at Least 10 mrem	11.0 km^2
Max. Downwind Distance of 10 mrem acute dose plume	6.8 km
Area With Acute Dose of at Least 1 mrem	173 km^2
Max. Downwind Distance of 1 Mrem acute dose plume	38.7 km
Acute Population Dose, 1990 (2000) [person-rem]	17,509 (15,495)
Range of Estimated Excess Latent Cancer Fatalities from Acute Dose, 1990 (2000)	9-56 (8-50)

1-Year Population Dose, 1990 (2000) [person-rem]	495,498 (438,516)
Range of Estimated Latent Cancer Fatalities from 1-year Dose, 1990 [person-rem]	248-1,586 (219-1,403)
50-year Population Dose, 1990 (2000) [person-rem]	9,944,974 (8,801,302)
Range of Estimated Latent Cancer Fatalities from 50-year Dose	4,972-31,824 (4,401-28,164)

The report also calculated the economic consequences for decontamination and cleanup from a train fire carrying radioactive waste as shown in the following table:

Area heavily contaminated (km^2)	9.9
Area moderately contaminated (km^2)	10
Area lightly contaminated (km^2)	62.4
Cost/km^2, heavy contamination	$394,604,748
Cost/km^2, moderate contamination	$182,592,165
Cost/km^2, light contamination	$128,263,609
Total Cleanup Costs	$13.7 billion

Marvin Resnikoff, one of the authors of the above report, by his declaration attached hereto, has updated the information in the 2001 report. As show in Dr. Resnikoff's declaration, the updated estimate of approximately 20 million person rem due to a major rail accident is approximately 1250 times Holtec's estimate. In addition, according to Dr. Resnikoff, DOE's 2008 risk estimate does not incorporate recent information about rail fires and

expanded traffic of oil tanker cars. This increased traffic of crude oil on rails has resulted in numerous derailments and fires. DOE and Holtec risk estimates need to take into account this new reality. Transportation casks are required to withstand a half hour fire at 1475°F, but many rail fires have burned hotter for considerably longer time periods.

In discussing the radiological impacts of transportation of the radioactive waste to the proposed CIS, the ER at 4.9.4 relies on several NRC documents. One of those documents is the Final Environmental Impact Statement for ISFSI in Tooele County, Utah (NUREG-1714)(Accession No. ML020150217). However, that document examines only local transportation impacts in and near the site of the waste storage facility. Therefore, it is completely irrelevant to determining the risks of cross country transportation and cannot be relied upon.

Another document relied on by Holtec regarding the transportation issues is the Generic Environmental Impact Statement of Continued Storage of Spent Nuclear Fuel (NUREG-2157). Reliance on this document by Holtec is misplaced for several reasons. First of all, NUREG-2157, 5.0, assumes the CIS facility will store up to 40,000 MTU of spent fuel. The Holtec facility, however, is proposed to store over 100,000 MTU of waste, not just spent fuel. The Holtec project,

therefore, would obviously involve more shipments of radioactive waste and more risk.

The most significant assumption made in NUREG-2157, 5.0, 5.16.2, is that a dry transfer system (DTS) would be required for long-term (> 60 years) storage. There is nothing in the Holtec documentation that contemplates a DTS. This assumption in NUREG-2157 also includes the assumption that the entire CIS facility would be replaced over the course of a 100-year interval, 1.8.3. There is nothing in the Holtec documentation that contemplates facility replacement.

Another reason Holtec cannot rely on NUREG-2157 is that NUREG-2157 does not consider the impact of deteriorating railroad infrastructure on transportation risks. There were recently two train derailments in southeast New Mexico over the weekend of July 21 and 22, 2018. At least one of the derailments was caused by the track giving way.

Pursuant to 10 C.F.R. § 72.108, the ER must discuss the risks and costs of transportation of the radioactive waste to the Holtec site.

CONTENTION 5

The ER states that waste would be stored at the CIS facility for up to 120 years until a permanent repository is found. The ER and the subsequent EIS must address the purpose and need and the environmental impacts if a permanent repository is not found, and the Holtec facility becomes a de facto permanent repository.

Basis for Contention

The ER states that radioactive waste would be stored at the CIS facility for up to 120 years until a permanent repository is found. ER 1.0. There is no assurance, however, that a permanent repository will ever be found. That was the basis for the decision of the Court of Appeals in New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012). In that case, the court held that the NRC, in preparing an EIS for the storage of spent radioactive fuel, must address the alternative of a permanent repository never being developed. That same analysis applies to this case. In other words, will the Holtec CIS facility become a permanent repository without the protections of a permanent repository?

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

The Holtec facility is designated as an interim storage facility and is designed as such. It is not designed to be a permanent repository. The DOE, in a Record of Decision approving an EIS for the management of radioactive waste (46 FR 26677; May 14, 1981), concluded that a mined geologic repository was necessary to adequately contain the radioactive waste. Therefore, the non-geologic, unprotected storage of the containers as proposed for the Holtec

facility would not satisfy the requirements for a permanent repository.

Pursuant to 10 C.F.R. § 51.45 an ER must discuss, inter alia, the impact of the proposed action and "appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Likewise, "an agency must look at both the probabilities of potentially harmful events and the consequences if those events come to pass." New York v. NRC, 681 F.3d 471, 478 (D.C. Cir. 2012). That requirement was the basis on which the court in New York v. NRC held that the agency had to consider the possibility that a permanent repository would never be found.

The analysis the court used in New York applies equally to this case. The likelihood that a permanent repository will be found is no closer to reality now than it was when New York was decided. The ER must therefore discuss and analyze the impacts of indefinite storage at the Holtec CIS facility.

CONTENTION 6

An ER is required to discuss alternatives to the proposed action. Pursuant to NEPA, this includes an examination of the no-action alternative. The discussion of the no-action alternative in the Holtec ER is deficient because it does not discuss safer storage methods at the reactor sites, such as HOSS, nor does it acknowledge the

NRC's Continued Storage Rule that concludes that waste can be safely stored at the reactor site indefinitely. Furthermore, the ER states that the no-action alternative is a reasonable alternative that would satisfy the purpose and need for the project.

Basis for Contention

The ER, and eventually the EIS prepared by NRC, must examine all reasonable alternatives, including the no-action alternative. This requirement is meaningless unless the no-action alternative is thoroughly and objectively evaluated. Only then can the proposed action be properly evaluated.

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

The ER discusses the no-action alternative in Section 2.1. That discussion states that if the Holtec proposal is not licensed, the spent fuel will be stored at the reactor sites until, if ever, a permanent repository is developed. There is absolutely no discussion about the safety aspects of keeping the waste at the reactor sites. There is absolutely no discussion of HOSS or the NRC's Continued Storage Rule, as discussed in previous contentions.

The importance of an adequate discussion of alternatives is highlighted by the statement in the NEPA regulations that the alternatives analysis is the "heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA demands that the environmental review "rigorously

explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 14(a).

NEPA regulations require a discussion of a no-action alternative. 40 C.F.R. § 1502.14(d). This discussion would be included in the "substantial treatment of each alternative" required to be considered in an EIS. 40 C.F.R. § 1502.14(b); see also, Southeast Alaska Conservation Council v. FHWA, 649 F.3d 1050 (9th Cir. 2011). In other words, the no-action alternative cannot just be blandly dismissed with unsupported statements. As noted above in support of Contention 2, the agency must not accept out of hand the applicant's statement of purpose and need. ELPC v. NRC, 470 F.3d 676, 683 (7th Cir. 2006), and then use that statement of purpose and need to summarily reject the no action alternative.

The section of the ER regarding the no-action alternative, 2.1, simply says that no action would mean that the waste would stay at the reactor site, subject to safety regulations. But there is no discussion of the relative benefits and costs of leaving the waste at the reactor site compared to the benefits and costs of sending waste from many reactors to the Holtec site. It is the comparison of the alternatives, including the no-action alternative, that is required and that is absent in the ER in this case.

A thorough discussion of the no action alternative is especially important in this case since the ER, 1.2, states that the no action alternative is a reasonable alternative that would satisfy the purpose and need for the project.

The analysis of the no-action alternative must include a discussion of the NRC's Continued Storage Rule that concludes that spent fuel can remain at the reactor site indefinitely and the implementation of HOSS at the reactor site.

Based on the foregoing, the discussion of the no-action alternative in the ER is deficient and must be rejected.

CONTENTION 7

Holtec relies heavily on the assertion that the Blue Ribbon Commission on America's Nuclear Future (BRC) has recommended CIS as the answer to the country's nuclear waste problem. On the contrary, the BRC report should not be viewed uncritically and does not necessarily deserve blind support in assessing the Holtec application. Holtec's ER therefore mischaracterizes both the BRC report's conclusions and the relative risks of CIS versus onsite storage. The EIS must therefore independently and fully address the relative risks and benefits of both storage options.

Basis for Contention

Holtec takes the position in its ER, Sec. 1.1 and 2.1, that the purpose and need for the CIS project is dictated to a great extent by the BRC report. According to Holtec, the BRC report concludes that CIS is the answer to our nuclear waste problem. A close and critical reading of the BRC

report, however, does not yield that conclusion. The BRC report is found at energy.gov/sites/prod/files/2013/04/f0/brc_finalreport_jan2012.pdf.

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

The history and background section of the ER, 1.1, promotes the Holtec CIS with the allegation that the CIS carries out the BRC's purported recommendation for CIS development as the solution to the country's nuclear waste problem. However, a close reading of the BRC report does not support the unwavering reliance Holtec places on it.

The introduction to the BRC report, at page xii, states, "[E]xperience shows that storage – either at or away from the sites where the waste was generated – can be implemented safely and cost-effectively." So the BRC was saying that storage at the reactor site is just as safe and cost-effective as a CIS site.

Page xii of the BRC report goes on to raise the concern that:

> For consolidated storage to be of greatest value to the waste management system, the current rigid legislative restriction that prevents a storage facility developed under the NWPA from operating significantly earlier than a repository should be eliminated.

In other words, the BRC was acknowledging that the NWPA focuses on the development of a permanent repository and

precludes the development of a CIS in the absence of a permanent repository.

On page xiii of the BRC report the Commission stated, "[I]t is appropriate for the NRC to examine the advantages and disadvantages of options such as 'hardened' onsite storage that have been proposed to enhance security at storage sites." This is hardly the robust support of CIS from the BRC that Holtec paints in its ER.

There is also a report by the Panel on Public Affairs of the American Physical Association, published in 2007, that contains the following statement:

> The panel concludes that the safety and security risks associated with storage of spent fuel are not appreciably different whether the fuel is stored at plant sites or in one or more consolidated facilities. The same storage technologies are employed in both cases and the operational, maintenance, and security requirements are identical.

American Physical Society, Consolidated Interim Storage of Commercial Spent Nuclear Fuel: A Technical and Programmatic Assessment, February, 2007, found at www.aps.org/policy/reports/popa-reports/upload/Energy-2007-Report-InterimStorage.pdf. So, just as the BRC concluded, the American Physical Society determined that storage at the reactor site is no less safe than at a CIS.

Holtec's ER therefore mischaracterizes both the BRC report's conclusions and the relative risks of CIS versus

onsite storage. The EIS must therefore independently and fully address the relative risks and benefits of both storage options.

CONTENTION 8

10 C.F.R. § 72.30 establishes requirements for decommissioning interim storage facilities. An application for licensing a CIS facility must contain a decommissioning plan explaining how the plan will satisfy the requirements in the regulation. The application for the Holtec CIS facility does not comply with these requirements because the amount of funds Holtec says it will collect over the anticipated life of the project fall way short of what Holtec says are necessary for decommissioning.

Basis for Contention

The decommissioning plan submitted by Holtec does not contain a funding plan that provides reasonable assurance that funds will be available to decommission the CIS site. Nor does the plan give a detailed cost estimate of the total cost of decommissioning. These are requirements that must be met pursuant to 10 C.F.R. § 72.30.

The SAR, 13.3, summarizes the decommissioning plan. Reference is made in that section to three other documents:

- CIS Decommissioning Plan – HI-2177558 (Accession No. ML18058A606)
- CIS Decommissioning Cost Estimate and Funding Plan – HI-2177565 (Accession No. ML18058A607)
- CIS Facility Financial Assurance & Project Life Cycle Cost Estimates – HI-2177593 (Accession No. ML18058A608)

Those documents do not satisfy the requirements of 10 C.F.R. § 72.30.

Holtec claims it will fund the decommissioning by setting aside $840/MTU stored at the facility. HI-2177593, 2.2. However, there is no assurance that this will actually be done. There is no indication as to what the income to the CIS will be so that we can be assured that there will be $840/MTU to be set aside.

Furthermore, the decommissioning costs are calculated for only the first phase of the project. Holtec states in the SAR, 13.3, and the internal documents cited above, that there will be 19 additional phases over the 40-year license period of the project. According to the CIS Decommissioning Cost Estimate and Funding Plan, Table 9.14, the total decommissioning costs for the first phase are $23,716,355. If the first phase is 5,000 MTUs, ER 1.3, and Holtec claims to set aside $840/MTU, that is a total fund of $4,200,000 for the first phase. So, if the total decommissioning costs for the first phase are $23,716,355, the fund of $4,200,000 is completely inadequate.

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

10 C.F.R. § 72.30 requires each application for a license to contain sufficient information to provide reasonable assurance that the decommissioning will provide

adequate protection to the health and safety of the public. The requirement includes a decommissioning funding plan showing reasonable assurance that funds will be available for decommissioning and a detailed cost estimate for decommissioning.

The application must also justify the key assumptions for the decommissioning cost estimate. In addition, there must also be a description of the onsite subsurface material containing residual radioactivity that will require remediation, as well as a certification that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning.

As explained above, there will not even be enough money in the decommissioning fund for the first phase. There is absolutely no discussion of how the decommissioning of the entire project, estimated to be 100,000 MTU, will be funded. If the cost of decommissioning for each phase is $23,716,355, as for the first phase, and there are expected to be 20 phases, the total decommissioning cost for 20 phases would be $474,327,100. If $840/MTU is set aside for the total expected 100,000 MTU to be stored in the CIS facility, the funds would total $84,000,000. Again, that is woefully inadequate to satisfy the requirements of 10 C.F.R. § 72.30.

CONTENTION 9

The containers in which the waste will be transported to and stored at the Holtec CIS site are designated for a design life of 60 years and a service life of 100 years and may present an unacceptable danger of radioactive release if they are required to remain after the end of their designated service life. Therefore, the ER must examine the environmental impact of the containers being used beyond their approved service life.

Basis for Contention

The most significant factor in the safety of the CIS facility is the safety of the containers that will be transported to and stored at the CIS site. Those containers are obviously the source of any radiation exposure since that is the source of the radioactive waste. It is planned that HI-STORE UMAX canister-based storage systems will be used at the Holtec site. The design basis life for the HI-STORE UMAX is 60 years and the service life is 100 years. As explained in Contention 5, the ER states that the waste may be stored up to 120 years until a permanent repository is found, but in fact, there may never be a permanent repository, so the UMAX system must be analyzed for the possibility of indefinite storage.

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

Holtec has identified the container system it will use to store the radioactive waste at the CIS site. That system is identified as the HI-STORE UMAX system. ER 1.3. The UMAX

system has been certified by the NRC pursuant to the FSAR submitted by Holtec. NRC Docket 72-1040. The FSAR (Accession No. ML16193A339) states that the design life of the UMAX system is 60 years and the service life is 100 years .

The Holtec ER states that the waste will be stored at the site up to 120 years until a permanent repository is found. ER 1.0 As discussed in Contention 5, there is no assurance that a permanent repository will ever be found and the Holtec site may become a de facto permanent repository. In any event, even the 120-year projection for the Holtec site would be 20 years beyond the service life certified for the UMAX system.

The design life is defined in the HI-STORM UMAX FSAR as "the minimum duration for which the component is engineered to perform its intended function set forth in this SAR, if operated and maintained in accordance with this SAR." In other words there is no assurance that the UMAX system will perform its intended function after 60 years. The service life is defined in the HI-STORM UMAX FSAR as "the duration for which the component is reasonably expected to perform its intended function, if operated and maintained in accordance with the provisions of this FSAR." In other words, this is the time period for which Holtec hopes the containers will function as intended.

So what happens after 60 years or 100 years? Neither the ER nor the SAR for the proposed CIS facility discuss that issue. The ER must consider all potential impacts if the CIS ultimately continues to operate beyond the design life and service life of the HI-STORM UMAX system. See, New York v. NRC, 681 F.3d 471 (D.C. Cir. 2012). Pursuant to 10 C.F.R. § 72.45(d), the SAR must analyze and evaluate "the design and performance of structures, systems, and components important to safety" from operation of the CIS facility.

While the HI-STORM UMAX system is certified for a design life of 60 years and a service life of 100 years, Holtec has asserted that the CIS facility is anticipated to be in service for 120 years. Or, as noted by other contentions herein, the CIS facility could become a de facto permanent repository. Therefore, certification of the HI-STORM UMAX system by the NRC does not excuse the failure to analyze the safety and environmental impact of the system for a time period beyond that for which the system is certified.

Nor does the Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, NUREG-2157, provide a basis for saying the containers are safe. NUREG-2157, 5.0, assumes that there will be a dry transfer system (DTS) that

would retrieve waste from the casks for inspection and repackaging in new containers. The problem is that the Holtec canisters cannot be inspected, repaired or repackaged. This was admitted by Dr. Kris Singh, CEO of Holtec, at www.youtube.com/watch?v=euaFZt0Pi4. Dr. Singh admitted that even a microscopic through-wall crack will release millions of curies of radionuclides into the environment. He also stated that it is not practical to repair the cracks even if you could find the cracks or a way to repair them, which they cannot. It will only introduce another area for cracking.

Furthermore, NRC staff has admitted that once a crack starts in a canister, it can grow through the wall in 16 years. Summary of August 5, 2014, Public Meeting With Nuclear Energy Institute, (Accession No. ML14258A081). NUREG-2157 did not consider any of these facts.

Holtec has also said that it will not accept for storage any container that is damaged or would leak, and that such a container would be returned to the source from which it was sent. ER, 4.12.2; SAR, 3.1.4.6. But as noted above, the containers cannot be inspected, so there is no assurance that a damaged or leaking container could even be discovered. Moreover, there would be an additional risk of sending a dangerous container back to the source. Neither

Holtec nor the source of the waste has a plan in place to deal with leaking or cracking containers. Leaking and cracking containers are not approved for transport. 10 C.F.R. § 71.44. There is no plan in place to prevent or stop cracks and leaks, repair cracks, or maintain and monitor the fuel and its containment in order to prevent leaks, explosions or criticalities. Nuclear Waste Technical Review Board, Geologic Repositories: Performance Monitoring and Retrievability of Emplaced High-Level Radioactive Waste and Spent Nuclear Fuel (May 2018), found at www.nwtrb.gov/our-work/reports/geologic-repositories-performance-monitoring-and-retrievability-of-emplaced-high-level-radioactive-waste-and-spent-nuclear-fuel. The impacts of this "return to sender" proposal must be evaluated.

CONTENTION 10

The proposed Holtec CIS facility will accept Greater Than Class C (GTCC) waste. NRC regulations specify that GTCC waste must be disposed of in a geologic repository licensed by the NRC, unless the Commission approves an alternative land-based disposal. The Holtec facility will not be a geologic repository. The NRC has not established regulations for approving land-based disposal of GTCC waste. The proposed Holtec CIS facility does not comply with the requirement for a geologic repository or land-based disposal for GTCC waste. Therefore, a license cannot be issued for this facility.

Basis for Contention

Pursuant to NRC regulations GTCC waste must be disposed of in a geologic repository or in a land-based disposal site

approved by the NRC. 10 C.F.R. § 61.55(a)(2)(iv). The Holtec site is not a geologic repository nor does the NRC have any basis for approving the site as a land-based disposal site. Therefore, the Holtec CIS facility will not comply with regulations and safe disposal alternatives.

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

The Holtec application states that, in addition to spent nuclear fuel, the CIS facility will accept Greater Than Class C (GTCC) radioactive waste. ER 1.0. 10 C.F.R. § 61.55(a)(2)(iv) specifies that GTCC waste must be disposed of in a geologic repository licensed by the NRC unless the Commission approves an alternative land disposal proposal.

The proposed Holtec CIS facility is clearly not a geologic repository. And none of the documents submitted by Holtec in support of its application to license the CIS facility address how or why the NRC should license the facility as a land-disposal alternative for the storage of GTCC waste. Nor does the NRC have any basis at this time for approving a land-disposal alternative. The NRC is in the process of developing regulations for the land disposal of GTCC waste. 83 Fed. Reg. 6475.

In connection with the rulemaking process, NRC staff prepared an analysis of the potential hazards associated with the disposal of GTCC (Accession No. ML17362A012). That

analysis found that specific types of CTCC contain significant amounts of U-235, Cs-237, and Pu-239. These results raise serious questions about the risks posed by land-based disposal of GTCC as envisioned by Holtec, and the NRC has not adopted a rule that would allow Holtec to store GTCC at the CIS facility.

By initiating the rulemaking process, the NRC admits that it has no legal or technical basis for approving a land-based disposal alternative for GTCC waste.

Thus, there is no legal basis for GTCC waste to be stored in a land-based facility as proposed by Holtec and NRC should not issue a license for it.

CONTENTION 11

The ER and the subsequent EIS must evaluate the potential for earthquakes at the Holtec site and the environmental impact of earthquakes. Likewise, the Safety Analysis Report (SAR) must adequately evaluate the earthquake potential of the proposed site. Both the ER and SAR are inadequate in this respect.

Basis for Contention

Drilling for oil and natural gas has increased significantly in and around the site of Holtec's proposed CIS facility in recent years. A map showing the intense drilling in the area is attached as Ex. 5. This drilling activity makes the underground area unstable and induces earthquakes. A recent study by Stanford University researchers has documented the existence of prior

earthquakes in southeast New Mexico, and more importantly, the existence of numerous faults in the area in and around the proposed Holtec site. A copy of the study is attached as Exhibit 6.

The potential for earthquakes would be an aspect of the environment affected and the environmental impacts of the project that must be included in the ER, pursuant to 10 C.F.R. § 51.45. The earthquake analysis must also be in the EIS.

Pursuant to 10 C.F.R. § 51.45 the ER must contain a description of the environment affected and the impact of the proposed project on the environment. The ER, 3.3.2, essentially dismisses the likelihood of earthquakes in the area and does not mention any environmental impacts from earthquakes. However, as shown by the increase in oil and gas drilling in the area and the Stanford report, the earthquake potential in the area is significant.

10 C.F.R. § 72.103(f)(1) requires that the SAR contain an adequate analysis of the earthquake potential of the area in and around the proposed Holtec site. The SAR submitted by Holtec does not comply with § 103(f)(1). The SAR, 2.6, discusses the geology and seismology of the area. But the earthquake information presented in the SAR is historical data that does not take into account the recent increase in

drilling for oil and natural gas in the area that creates induced earthquakes.

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

10 C.F.R. § 72.103(b) requires that in areas of known potential seismic activity east of the Rocky Mountain Front, seismicity must be evaluated using designated techniques. Those techniques are specified in § 72.103(f), as:

> (1). . . The geological, seismological, and engineering characteristics of a site and its environs must be investigated in sufficient scope and detail to permit an adequate evaluation of the proposed site, to provide sufficient information to support evaluations performed to arrive at estimates of the DE [design earthquake ground motion], and to permit adequate engineering solutions to actual or potential geologic and seismic effects at the proposed site.
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> **********
>
> (2). . . The geologic and seismic factors considered for design must include a determination of the DE for the site, the potential for surface tectonic and nontectonic deformations, the design bases for seismically induced floods and water waves, and other design conditions as stated in paragraph (f)(2)(iv) of this section.
>
> **********
>
> (i) Determination of the Design Earthquake Ground Motion (DE).
>
> (ii) Determination of the potential for surface tectonic and nontectonic deformations.
>
> (iii) Determination of design bases for seismically induced floods and water waves.
>
> (iv) Determinations of siting factors for other design conditions.

The Holtec ER, 3.3.2, contains a very short discussion of seismic information. Aside from giving the issue fairly short shrift, the main problem with the discussion is that it relies on historical earthquake data that is outdated in light of recent fracking activity that will induce earthquakes in the area. The discussion of earthquake potential in the ER fails to consider the impact of fracking.

Likewise, the SAR, 2.6, refers only to historic earthquake data. Furthermore, the assertion in the SAR, 2.6.3, that there are no surface faults at the Holtec site is contradicted by the Stanford University study noted above and the accompanying map.

Even the oil and gas industry is concerned about the dangers of fracking as it relates to the safety of the Holtec project. On July 30, 2018, Fasken Oil and Ranch, Ltd. and the PBLRO Coalition submitted scoping comments as part of the NEPA process (copy attached as Ex. 7). Fasken is an oil and gas operator with interests adjacent to the Holtec site. The PBLRO Coalition is a coalition of landowners, ranchers, and oil and gas operators from throughout Texas, New Mexico and the Permian Basin formed to respond to the Holtec project. The significant portion of that letter reads as follows:

> The proposed site sits on top of and adjacent to oil and gas minerals to be developed by means of fracture stimulation techniques. Currently, drilling techniques used to extract minerals in the Permian Basin involve drilling horizontally into deep underground formations up to two miles beneath the earth's surface. High pressure fluids are pumped into the wells, in some cases exceeding twelve thousand pounds per square inch. This pressure is power enough to fracture the surrounding rock thus releasing the oil and gas. The pressure creates fissures and cracks beneath the surface. And, at this time, there are oil and gas operators testing a new technique of simultaneously drilling and fracturing up to 49 horizontal wellbores in a single section of land. Either the traditional or new and unproven drilling technique, involving more than 20,000,000 bbls of water and sand, could conceivably be utilized to inject into and withdraw from the rock formation beneath and surrounding the Holtec site. Hydraulic fracturing beneath and around Holtec should give the NRC pause and is sufficient reason not to proceed.

10 C.F.R. § 72.103 requires a discussion and analysis of the seismological characteristics of the proposed CIS site because of the obvious impact earthquakes would have on the safe operation of the facility. The failure of Holtec to undertake the required seismological analysis violates this requirement.

CONTENTION 12

The dunes sagebrush lizard, a/k/a sand dune lizard, is an endangered species pursuant to New Mexico state law and regulation. The lizard has a limited range and is specifically adapted to sand dune areas with shinnery oak. The site of the Holtec project is within the lizard's habitat range. The ER submitted by Holtec claims that the lizard is not present in the area of the Holtec site, but that assertion is contrary to the scientific evidence. The ER and the subsequent EIS must evaluate the impact of the Holtec project on the dunes sagebrush lizard and its habitat.

Basis for Contention

10 C.F.R. § 51.45 requires that an environmental report must contain a discussion of the environment affected by the proposed project and the environmental impacts of the project. This includes a discussion of the various species present and their habitat. The NRC's Environmental Review Guidance for Licensing Actions Associated With NMSS Programs (NUREG-1748)(Accession No. ML032450279), 5.3.5, also directs that the ER must discuss the affected environment and the impacts on the environment, including impacts to important species and their habitats.

The Holtec site is within the habitat range of the dunes sagebrush lizard (maps attached as Ex. 8 and 9), but the ER, 3.4.3, 4.4.3, 4.4.4, makes no mention of the impact of the project on the lizard or its habitat. This is a violation of NRC regulations and guidance as discussed above.

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

The ER, 3.4.3.1, refers to a 2007 ELEA survey (Accession No. ML102440738) that allegedly found no reptiles in the area of the Holtec site . That section also refers to a 2016 survey, ER, App. B, that found no reptiles in the area.

It is not entirely clear from the report, but it appears that the 2016 survey was conducted on one day and, with respect to animals, it was based on casual observation, not a detailed survey. That is not a valid biological assessment. It should be axiomatic that an endangered species will not be immediately observed because there are so few individuals. That is why it is endangered. Furthermore, the 2016 survey was conducted in October, a time of year when the lizard, a cold-blooded creature, is hibernating. So the 2016 survey is not a credible basis for concluding that the dunes sagebrush lizard is not present at the Holtec site.

The 2007 ELEA survey should also be viewed with skepticism. First of all, ELEA paid for this survey. ELEA is the entity that for years has promoted some sort of nuclear project at the Holtec site. There is no indication as to what professional entity prepared the report or conducted the survey. ELEA is simply a consortium of local governments. It does not have the expertise to conduct a survey as set forth in the report.

A comparison of the 2007 ELEA report and the 2016 survey generates further skepticism. The 2007 report, 2.6.1.1, lists the sand dune lizard as likely to be present at the site and the vicinity. And this is a report primarily

relied upon in the ER to contend that the dunes sagebrush lizard is not present. But the ER claims that the lizard is not present at the Holtec site, simply because it was not seen in the 2007 survey or the 2016 survey. However, as noted previously, the 2016 survey was conducted on one day at a time of year when the lizard would be hibernating. And, as admitted in the 2007 survey report, 2.6.1.1, no reptiles were observed due to the season.

It is clear, therefore, that neither the 2007 nor the 2016 survey, on which the ER relies to contend that the dunes sagebrush lizard is not present at the Holtec site, justify that contention. Furthermore, the attached maps show that the Holtec site is likely habitat for the dunes sagebrush lizard. Based on the foregoing, the NRC must reject the ER submitted by Holtec as it relates to the dunes sagebrush lizard.

In addition, the NRC must conduct an independent, scientifically valid survey for plants and animals in the area of the Holtec site in preparation of the EIS.

CONTENTION 13

As shown in previous contentions, the Holtec ER is replete with errors, omissions, and blatently incorrect statements and information. Further, Chapter 12 of the ER shows that a company called Tetra Tech, was the primary preparer of the ER. The only other preparer listed was a subcontracting company that conducted the cultural resource evaluation. Tetra Tech was accused of engaging in widespread fraud with respect to its contract with the United States

Navy to clean up radioactive materials at the Hunter's Point Naval Shipyard in San Francisco, California. As such, Tetra Tech's credibility is in question and the credibility of the ER prepared by Tetra Tech likewise is in question.

Basis for Contention

The NRC is supposed to be able to rely on the ER submitted by a license applicant as the initial basis for preparation of the EIS. Review of the ER is one of the first steps in the NRC's environmental review. Environmental Review Guidance for Licensing Actions Associated With NMSS Programs (NUREG-1748)(Accession No. ML032450279), § 1.3.3. Therefore, the NRC must be able to rely on the credibility of the ER. Given Tetra Tech's history of fraud, that credibility is not present with the ER in this case. As a result, the ER must be redone by a credible and trustworthy preparer.

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

Tetra Tech is a corporation that provides engineering services on environmental matters. In about 2008-2009, Tetra Tech was hired by the United States Navy to clean up radioactive materials at the Hunter's Point Naval Shipyard in San Francisco. As described in lengthy detail in a petition to the NRC pursuant to 10 C.F.R. § 2.206 asking the NRC to revoke Tetra Tech's license (Accession No. ML18178A067)):

> Tetra Tech employees and the radiological subcontractors it directly supervised were involved in at least six types of fraud: (1) fake sampling, in which soil samples – potentially thousands of them – were reported to have been taken at one location when they were actually taken from another; (2) discarding samples and analytical results when they came back radiologically too "hot" (i.e., above the cleanup standard); (3) altering scanning data to make them appear radiologically acceptable; (4) conducting false building surveys in which certain scan results were fabricated and others were falsified; (5) remediating radioactive material in soil improperly, resulting in potentially radioactively-contaminated soil being shipped offsite as well as being used as backfill for trenches at the Shipyard; and (6) altering Portal Monitor procedures so potentially radioactively-contaminated soil was allowed to be shipped offsite for commercial purposes to places unknown.

Also attached hereto as Ex. 10 is a declaration of Steven Castleman, the attorney who prepared the 2.206 petition. Mr. Castleman's declaration quotes Professor Kathryn Higley, Head of the School of Nuclear Science and Engineering in the College of Engineering at Oregon State University, as saying that a substantial but undefined proportion of Tetra Tech's data from the Hunters' Point cleanup was suspect and was " to a large extent useless."

Mr. Castleman's declaration also states that an official with the United States Navy confirmed what Dr. Higley said and further stated that the Navy had lost confidence in the Tetra Tech data. The Navy official further stated that the Navy was going to treat all of Tetra Tech's

data as unreliable. The NRC should therefore treat the Holtec ER as unreliable.

As a result of the events at Hunter's Point, the NRC fined Tetra Tech $7,000 (Accession No. ML16207A292). The NRC found that Tetra Tech engaged in "a deliberate falsification of soil sample surveys" at Hunter's Point. The violation notice also makes the finding that the violation was willful.

An environmental document must be free of bias and doubts about the accuracy and reliability of its contents. Greene Co. Planning Bd. v. Federal Power Comm., 455 F.2d 412 (2d Cir. 1972); Sierra Club v. Corps of Engineers, 701 F.2d 1011 (2d Cir. 1983). Tetra Tech has shown by its past conduct that it cannot be trusted to provide credible information. A review of the ER in this case shows how Tetra Tech has improperly prepared the ER to justify the Holtec project:

- The ER, 1.0, states that the Holtec facility will accept CTCC waste. Pursuant to 10 C.F.R. § 61.55(a)(2)(iv), GTCC waste must be disposed of in a geologic repository. So the ER, as prepared by Tetra Tech, is proposing something that is illegal.

- The ER, 3.3.2, gives short shrift to the likelihood of earthquakes in the area of the Holtec site, and relies on

historic earthquake data. Tetra Tech obviously made no effort to obtain current data that would have raised the issue of earthquake impacts due to oil and gas exploration in the area. This was a case of willful blindness.

- The ER, 3.4.3, 4.4.3, 4.4.4, makes no mention of the impact of the Holtec project on the dunes sagebrush lizard, even though the project is in the area of the lizard's habitat. Further, Tetra Tech has manipulated the discussion in the ER by ignoring that the alleged "surveys' for protected species were simply one-day walk throughs and/or observations conducted at times of the year when the lizard would be hibernating.

- In the face of the clear directive from the court in New York v. NRC, Tetra Tech failed to discuss or analyze the impacts in the event that the Holtec project becomes a de facto permanent repository. There is absolutely no indication, let alone assurance, that a permanent repository will ever be developed.

- Holtec has said that if it receives a damaged or leaking container at the CIS facility, it will ship the container back to the reactor site from which it came. The ER does not discuss, or even mention, this scenario or how the inspection would be done or the impacts of sending a damaged or leaking container back to the reactor site.

- The ER, 1.2, claims that storage at the Holtec site will be safer and more secure than storage at the reactor site. But Tetra Tech did not provide any basis for that statement. In fact, that statement conflicts with the determination in the Continued Storage Rule, 10 C.F.R. § 51.23, that spent fuel can be stored safely at the reactor site indefinitely.

- The ER, 1.1 and 2.1, state that the purpose and need for the Holtec project is dictated to a great extent by the Blue Ribbon Commission report. However, as shown by the discussion regarding Contention 7 herein, the BRC report does not support the assertions made in the ER. Tetra Tech clearly misstated and mischaracterized the BRC report.

It is apparent from the foregoing that Tetra Tech has manipulated, mischaracterized, omitted, and misstated claims made in the ER in order to downplay or ignore environmental impacts of the Holtec project. The ER should therefore be rejected and a new ER prepared by a credible source.

CONTENTION 14

An accurate thermal evaluation of the HI-STORM UMAX system is imperative to ensure that temperatures within the system will not be conducive to corrosion, cladding and other conditions that would adversely impact the safety of the system. The HI-STORM UMAX system is unique, with both air intake and exhaust vents at the top of the containment cask. The SAR for the Holtec CIS facility does not provide adequate information to determine if the thermal parameters for the HI-STORM system at the Holtec CIS facility will provide for adequate safety.

Basis for Contention

10 C.F.R. § 72.236 sets forth the specific requirements for spent fuel storage cask approval and fabrication. Among those requirements are: (f) The spent fuel storage cask must be designed to provide adequate heat removal capacity without active cooling systems and (g) The spent fuel storage cask must be designed to store the spent fuel safely for the term proposed in the application, and permit maintenance as required.

The SAR for the Holtec project, Chapter 6, purports to discuss the thermal evaluation for the HI-STORM UMAX, but does not address the problems presented by the fact that the UMAX cask is unique, in that the air intake and exhaust vents are at the top of the cask. To be effective, the top design must ensure that the entering and exiting air flows do not mix, and the insulating cylinder must ensure that the downflowing cooling air is not heated. There is no assurance that the design of the UMAX system accomplishes these goals.

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

Thermal evaluation of nuclear storage systems is important because the radioactive waste is still hot and must be kept at a reasonable temperature so that the cladding will not degrade. Thermal analysis for the UMAX

cask system, which would be used at the Holtec CIS facility, is based on theoretical calculations. The software itself, such as FLUENT, has been used for many applications, not just nuclear storage casks.

But the UMAX cask is unique, with both air intake and exhaust vents at the top of the cask. This is different than the HI-STORM F/W and the HI-STORM 100, where cooler air is drawn from the bottom intakes, passes outside the hot canister and exits through the upper vents. In this sense, it is much like a chimney. In contrast, the UMAX cask draws air from the top intake, air passes down between an insulated cylinder and outer wall, then rises between the canister and the inner side of the insulated cylinder. To be effective, the top design must ensure that the entering and exiting air flows do not mix, and the insulating cylinder must ensure the downflowing cooling air is not heated. The SAR does not provide assurance that the flowing air volume is sufficient to cool the canister.

In addition, convective flow within the canister itself must be unimpeded. Holtec has redesigned the shims within the canister to allow greater coolant movement, but the basis for this change was listed as proprietary, as are all the thermal calculations, so Dr. Marvin Resnikoff, on whose analysis and opinions this contention is based, and Sierra

Club have no way to determine if the UMAX casks are any safer than before the recent changes. In spite of a FOIA request and direct conversation with Holtec's legal counsel, Sierra Club has not been able to obtain the proprietary information that Dr. Resnikoff needs to make an informed opinion. It will obviously be necessary for Sierra Club to be allowed to intervene and conduct discovery in order to obtain this information.

The lack of testing and reliable confirmation of this unique cask design is troubling. If fuel cladding is overheated, the fuel may not be acceptable for a waste storage facility. The heat output from nuclear fuel with time is reliably known. What is not known to this same degree of certainty is the ability of the UMAX cask to dissipate this heat output. To make this determination one would need to know the air temperature and air flow rate, variables that could be measured. The minimum values of these variables should be conditions of the Certificate of Compliance.

Adding further concerns about the safety of the UMAX system is the fact that there is no information in the Holtec documentation in this case as to how much of the spent fuel that would be stored at the CIS facility would be high burnup fuel. For high burnup fuel, the cladding

surrounding the nuclear fuel is thinner, more brittle, with additional cracks. Therefore, the cladding can shatter and a large inventory of radioactivity, particularly cesium, could be released.

There is also a safety concern due to Holtec's recent announcement that it claims to have a process whereby the spent fuel can be taken from the reactor pools and placed in the UMAX canister after being in the pool for only 2.5 years. This would be unprecedented and there is no information in the Holtec SAR or other documentation in this case evaluating the safety of that proposal.

CONTENTION 15

The ER fails to adequately determine whether shallow groundwater exists at the site of the proposed CIS facility. It is important to make this determination in order to assess the impact of a radioactive leak from the CIS facility on the groundwater.

Basis for Contention

If contaminants leak from the CIS facility, they could be transported by shallow groundwater underlying the site. The ER, 3.5.2.1, claims there is probably no shallow groundwater at the site. However, there is no indication in the ER that Holtec has done the field investigations necessary to determine whether shallow groundwater exists.

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

These facts are based on the declaration of George Rice, hereto attached.

The claim in the ER that there is probably no shallow groundwater at the site is based on information obtained from onsite drilling. Only one test well, ELEA-1, has been completed at the interface of the alluvium and the Dockum geologic formation. That well has not been checked for the presence of water since 2007. This is significant since shallow aquifers may be intermittently saturated.

Furthermore, as described in George Rice's declaration, one well is not sufficient to determine whether shallow groundwater exists at the site. Although other wells have been installed, they have not been placed in the appropriate depth to determine the presence of shallow groundwater.

Mr. Rice also explains why saturated conditions were not encountered in the alluvium, but there may still be shallow groundwater at the site. Drilling with air will often dry the cuttings as they are brought to the surface and water may drain from the cuttings as they are brought to the surface. Mr. Rice also notes that the caliche and alluvium at the Holtec site are not dry. Water contents were measured in samples that came from 10-30 feet below land surface. The water contents ranged from 5-16 percent by weight. This indicates that precipitation is infiltrating

from land surface and moving toward the alluvium/Dockum interface.

Mr. Rice concludes by recommending that Holtec be required to install a network of monitoring wells at the site at the alluvium/Dockum interface. This is necessary to comply with the requirement of 10 C.F.R. § 51.45 for the ER to adequately and thoroughly evaluate the affected environment and the impacts of the project to that environment.

CONTENTION 16

The ER does not contain any information as to whether brine continues to flow in the subsurface under the Holtec site.

Basis for Contention

Two brine disposal facilities once operated in the northeast portion of the Holtec site. A water sample was collected in 2007 from one of the springs immediately south of the Holtec site. That sample contained brine. ER 3.5.2.1.

The ER does not adequately address basic questions regarding the subsurface movement of brine. This is important because brine could cause corrosion of the containers holding the radioactive waste and cause leaks in the containers.

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

These facts are based on the declaration of George Rice, hereto attached.

10 C.F.R. § 51.45 requires an ER to thoroughly describe and evaluate the affected environment and the environmental impacts of the proposed project. The Holtec ER notes that brine was detected in a water sample from a spring immediately south of the Holtec site. ER 3.5.2.1. However, as Mr. Rice notes, the ER does not determine whether the springs/seeps that were flowing in 2007 continue to flow; whether the brine is moving along parched zones in the alluvial materials or along the alluvium/Dockum interface; and whether the brine could come into contact with the storage containers.

As explained in Contention 9, the UMAX container system was certified for a design life of 60 years and a service life of 100 years. But Holtec envisions this CIS facility operating for at least 120 years. So there is no evaluation for the corrosion potential of the containers due to brine in the groundwater after the period for which the containers are certified. That is why the ER must evaluate the nature and location of the brine as described by Mr. Rice.

CONTENTION 17

The ER and SAR do not discuss the presence and implications of fractured rock beneath the Holtec site. These fractures could allow radioactive leaks from the CIS facility to enter groundwater or for the brine described in

Contention 16 to corrode the containers contained the radioactive material.

Basis for Contention

Geologic boring logs have identified fractured rock beneath the are of the Holtec site. Fractures could rapidly convey contaminants to underlying groundwater. Neither the ER nor the SAR discuss the fractured rock under the site.

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

These facts are based on the declaration of George Rice, hereto attached.

10 C.F.R. § 51.45 requires an ER to thoroughly discuss and evaluate the affected environment. That certainly includes the geology beneath the Holtec site. Likewise, 10 C.F.R. § 72.103 requires the SAR to discuss and evaluate the geological characteristics of the Holtec site.

As explained in George Rice's report, sources other than the ER and SAR document the presence of fractured rock in the area of the Holtec site. GEI report (Accession No. ML18023A958). Some portions of the Chinle and Santa Rosa formations are described as highly fractured. Although the ER, 3.3.1, and the SAR, 2.6.1 and 2.6.4, discuss the geologic characteristics at the site, neither reference notes the presence or likely presence of fractured rock. The ER makes no mention at all of the possibility of fractured

rock and the SAR, 2.6.4, claims that "conditions at the Site are not conducive to karst development." This discussion is insufficient to satisfy the requirements of the NRC regulations for discussing the geologic characteristics of the site in light of the facts presented in Mr. Rice's report.

Therefore, Holtec must determine and discuss in the ER and SAR whether fractures are a potential pathway for contaminants to migrate to underlying groundwater.

CONTENTION 18

The Santa Rosa Formation is an important aquifer in the area of the Holtec site. It is used for domestic water supply, stock watering and irrigation. The Holtec ER has not adequately determined and discussed the possibility that waste-contaminated groundwater could reach the Santa Rosa Formation.

Basis for Contention

As explained in Contentions 15, 16 and 17, the nature, extent and location of shallow groundwater in the area of the Holtec site must be determined and adequately discussed and evaluated in the ER. The groundwater issues have not been adequately discussed and evaluated in the ER with respect to the impact on the Santa Rosa Formation.

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

These facts are based on the declaration of George Rice, hereto attached.

10 C.F.R. § 51.45 requires an ER to thoroughly discuss and evaluate the affected environment. That requirement certainly includes a discussion and evaluation of the groundwater in the area of the Holtec site. More specifically, the Santa Rosa Formation, which is an important aquifer in the area, must be evaluated with respect to whether waste-contaminated groundwater could impact the Santa Rosa aquifer.

The ER, 3.5.2.1, mentions the Santa Rosa Formation, but contains no discussion of it nor any of the points raised in Mr. Rice's report.

CONTENTION 19

Holtec performed two sets of packer tests in the Santa Rosa Formation to estimate the hydraulic conductivity (permeability) of the formation. These tests were conducted in conjunction with the preparation of the ER. It does not appear from the report of Holtec's consultant that these tests were conducted properly. Therefore, the ER has not presented an adequate evaluation of the affected environment.

Basis of Contention

10 C.F.R. § 51.45 requires an ER to thoroughly and accurately discuss and evaluate the environment that will be affected by the proposed project. The permeability of the site is certainly important to assessing whether the site is appropriate for the proposed CIS facility. The report from GEI Consultants is inadequate to properly assess the permeability of the site.

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

These facts are based on the declaration of George Rice, hereto attached.

It is important to determine the hydraulic conductivity of the geologic formation under the Holtec site. GEI Consultants was hired to conduct Packer tests at the site to determine the conductivity. GEI claimed to have used the testing methods set out in the U.S. Bureau of Reclamation Field Manual. But as Mr. Rice notes in his report, GEI does not appear to have followed several recommendations in the manual.

Based on the points made by Mr. Rice, the results of the packer tests are unreliable and do not satisfy the requirements of 10 C.F.R. § 51.45.

CONTENTION 20

Since the 1990's almost all spent nuclear fuel being generated is high burnup fuel (HBF). HBF causes the cladding to become thinner, creating a higher risk of release of radioactive material. The cladding also becomes more brittle, with additional cracks. This situation causes risks for short-term and long-term dry storage. This issue is not adequately addressed in the SAR and high burnup fuel does not appear to be addressed in the ER at all. Cladding failure due to high burnup fuel is an issue that must be adequately addressed.

Basis for Contention

High burnup fuel causes the cladding around the fuel to become thinner and more brittle, inducing cracking. This

makes the storage and transportation of containers loaded with high burnup fuel more likely to leak radioactive material into the environment.

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

Since 1999 the amount of high burnup fuel (HBF) being used in nuclear reactors has increased substantially. Since 2012 all of the fuel used in reactors has been HBF, as shown in the graph below.

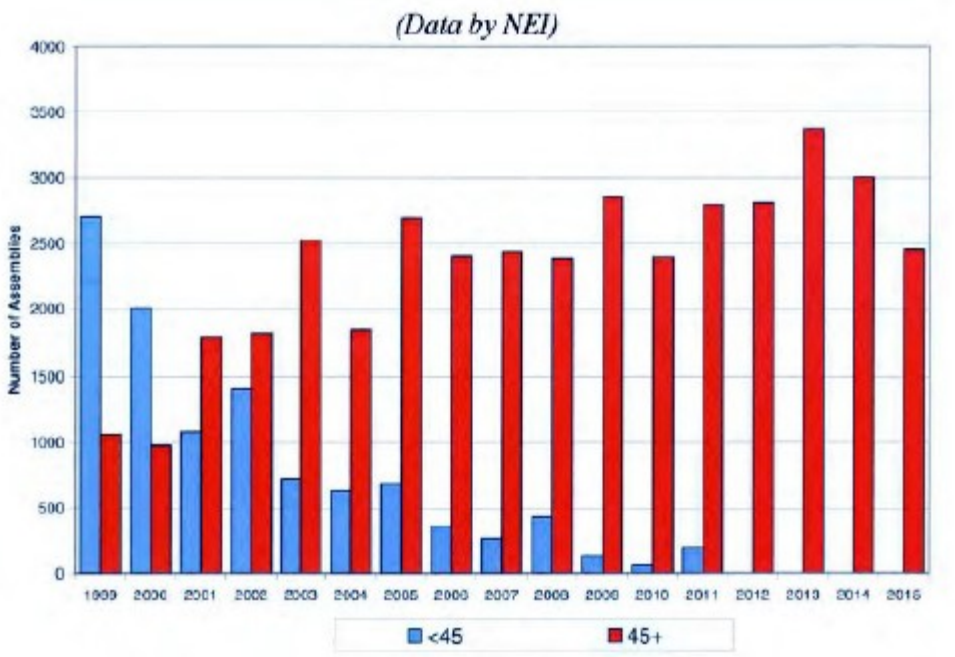


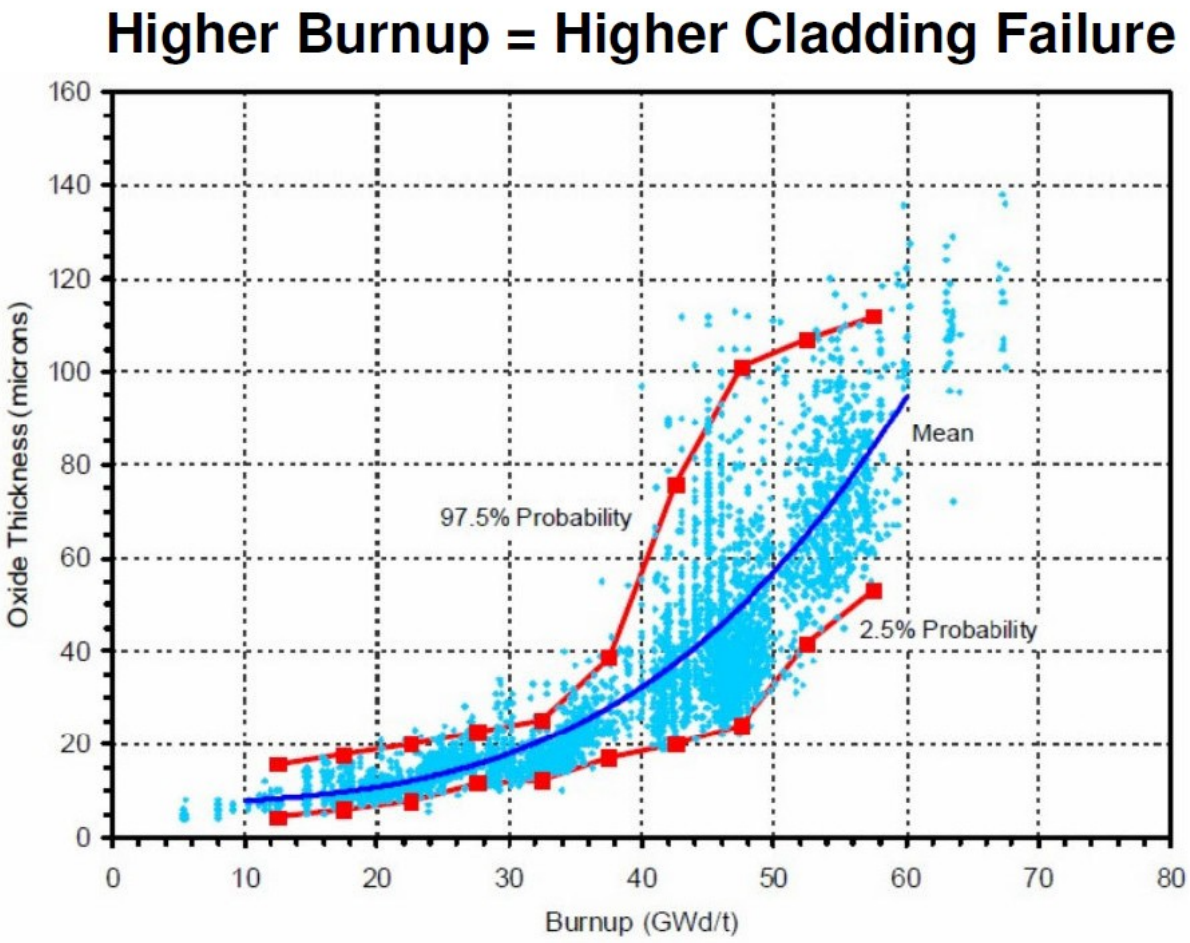
Figure 27. Projected PWR Burnup Distribution Through 2015[89]
(Note: graph units are GWd/MTU)

HBF is dangerously unpredictable and unstable in storage, even for a short term. HBF is over twice as radioactive and over twice as hot as regular nuclear fuel.

A June 2013 Department of Energy report states, "… cladding performance issues need to be addressed before this

fuel can be loaded into dry casks and transportation systems," and "burnup rates as low as 30 Gwd/MTU can present performance issues including cladding embrittlement under accident conditions as well as normal operations." The DOE report is found at www.hsdl.org/?abstract&did=739345.

According to the Nuclear Waste Technical Review Board (NWTRB), the maximum oxide thickness for HBF (60-65 Gwd/MTU) is 100 µm, as seen in the figure below.



Higher oxide thickness results in higher cladding failure. Argonne scientists reported high burn-up fuels may result in fuel rods becoming more brittle over time. "... insufficient information is available on high burnup fuels to allow reliable predictions of degradation processes during extended dry storage." U.S. Nuclear Waste Technical Review Board *Evaluation of the Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel,* December 2010, Burnup Chart Page 56

According to the NWTRB, this corresponds to a metal loss of 70 µm, using conservative assumptions. Since ZR cladding is 600 µm, this represents a thinning of the cladding wall of approximately 12%.

During reactor operation, there is friction wear between the cladding and fuel pellets caused by vibrations. If this wear is severe, a breach can occur. According to the NWTRB, this is the principal cause of cladding failure of reactor fuel rods. Since HBF remains in the reactor longer, the likelihood of cladding defects is increased.

The ER and SAR must discuss and evaluate the risks of transporting and storing HBF due to deterioration of the cladding from HBF.

CONTENTION 21

There is no experimental support for the safe transportation and storage of HBF. Holtec must show that safety is assured not only for hypothetical accident conditions, but also for real life accident conditions. Holtec has not done that in this case.

Basis for Contention

NRC staff says it is continuing to review data on mechanical and fracture toughness properties of spent fuel cladding in order to develop further guidance to meet the requirements of 10 C.F.R. §§ 71.55, 71.43(f) and 71.51 for transportation of spent fuel. But it is not clear how this

is being done. There has certainly been no data on HBF in this regard.

NRC staff has therefore said that pending further guidance, transportation of HBF will be addressed on a case-by-case basis. Holtec has not met this test.

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

10 C.F.R. § 72.108 states that an ER must adequately discuss and evaluate the impacts of transportation of nuclear waste to a storage facility. The transportation of HBF especially must be addressed in the ER.

NRC staff guidance, ISG-11, Rev. 3, found at www.nrc.gov/reading-rm/doc-collections/isg/isg-11R3.pdf, states that it "is continuing to review the data on the mechanical and fracture toughness properties of commercial spent fuel cladding in order to develop further guidance to assist the applicant in meeting the requirements of 10 CFR 71.55, 10 CFR 71.43(f), and 10 CFR 71.51 for transportation." But it is not clear how this is being done. A paper often referred to is Einziger et al., Examination of Spent PWR Fuel Rods After 15 Years of Dry Storage (2003) (Accession No. ML032731021), where it is reported that "irradiated Surry-2 PWR fuel rods (35.7 Gwd/MTU) that were stored for 15 years at an initial temperature of 350°C (with temperatures reaching as high as 415°C for up to 72 hours)

experienced thermal creep, which was estimated to be less than 0.1 percent." But HBF can have burnups twice as high. Therefore, the Einziger paper is not relevant to HBF.

ISG-11, referenced above, states that for hypothetical accident conditions, "the licensee must assure that there is not significant cladding failure," while requiring that "cladding performance during hypothetical accident conditions of transport will require further information on the impact properties." The staff recognizes that "data is not currently available." The staff states that "until further guidance is developed, the transportation of high burnup commercial spent fuel will be handled on a case-by-case basis." Holtec has not met this test. HBF should not be transported until Holtec can assure that it is safe. The ER must address real life accident conditions based on the specific facts of this case.

CONTENTION 22

With high burnup fuel hydrogen absorption into the Zircaloy metal can lead to hydrogen embrittlement (loss of cladding ductility) of the cladding. Vibrations during transport will lead to further degradation of the cladding. Nothing in the Holtec documentation shows that Holtec has addressed this issue in this case.

Basis of Contention

10 C.F.R. § 72.108 requires the ER to discuss and evaluate the impacts of transportation of the radioactive waste to the Holtec site. This would include the risks

inherent in the transportation of HBF. The ER in this case has not adequately made the evaluation of the loss of ductility on the fuel rods due to the HBF and the likelihood of material strength and a release of radioactive material.

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

According to the Nuclear Waste Technical Review Board, particularly in pressurized water reactors, hydrogen absorption into the Zircaloy metal (hydrides) can lead to hydrogen embrittlement (loss of cladding ductility) of the cladding. "Radial-oriented hydrides can embrittle the cladding and lead to delayed hydride cracking." Chan, An Assessment of Delayed Hydride Cracking in Zirconium Alloy Cladding Tubes Under Stress Transients (2006)(Accession No. ML112650048).

ISG-11, Rev. 3, states that "reviews of the transportation of commercial and noncommercial spent fuel will be handled on a case-by-case basis." Holtec has not met this test. HBF should not be transported until Holtec can assure that it is safe. The ER must address real life accident conditions based on the specific facts of this case.

CONTENTION 23

Spent fuel cladding must be protected during storage against degradation that leads to gross ruptures in the fuel or the fuel must be otherwise confined such that the

degradation of the fuel during storage will not pose operational safety problems with respect to its removal from storage. It is the responsibility of the licensee to ensure that fuel placed in dry storage meets the design-basis conditions. If HBF develops gross cladding defects during transportation, Holtec has not described how such defects could be detected. If HBF develops gross cladding defects and the fuel cannot be accepted at a waste repository, the fuel will remain at the proposed CIS facility indefinitely.

Basis of Contention

10 C.F.R. § 72.122(h)(1) states that spent fuel cladding must be protected during storage against degradation that leads to gross ruptures in the fuel or the fuel must be otherwise confined such that the degradation of the fuel during storage will not pose operational safety problems with respect to its removal from storage. Gross cladding defects are applicable to all phases of dry cask storage. Holtec has not specified how it will address the safety issues inherent in the gross cladding defects due to HBF.

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

Gross cladding defect is defined as a known or suspected cladding condition that results in the fuel not meeting its design-basis criteria for dry cask storage. Known or suspected failed fuel assemblies (rods) and fuel with cladding defects greater than pin holes and hairline cracks are not authorized.

In addition, both individual fuel rods and fuel assemblies should be intact to preclude fuel handling or operational safety problems during loading and unloading operations. It is the responsibility of the licensee to ensure that fuel placed in dry storage meets the design-basis conditions. This definition is applicable to all phases of dry cask storage (from selection and inspection of the fuel before loading until the fuel is unloaded from the cask or the cask is placed in a permanent repository). Alternative means, such as canning, will be required for dry cask storage of fuel that does not meet design-basis conditions.

If HBF develops gross cladding defects during transportation, Holtec has not described bow such defects could be detected. When HBF within a Holtec canister is transported to a repository and the canister is unloaded and the fuel transferred to a disposal cask, Holtec has not specified how such fuel would be managed. Anticipating this issue, the Maine Yankee utility canned all HBF. Unless Holtec can present assurance that HBF will not have gross cladding defects, all HBF may remain at the CIS facility unless the HBF is canned.

CONTENTION 24

Because of the high heat output of fuel within MPC-37 canisters, there is a long decay time before shipments to

the Holtec CIS facility can occur. The loading of the MPC-37 is quite complicated. It is unclear when reactors will be allowed to ship the MPC-37 to the Holtec facility. There is a serious risk of radioactive contamination if the radioactive waste is shipped too soon. Information that would inform the public and analysts has been withheld as being proprietary information. Neither the Holtec ER or SAR contain sufficient information to assess the risk of shipping the MPC-37 canisters.

Basis for Contention

Radioactive waste from the nuclear reactors must be loaded safely. Holtec must assure that the MPC-37 canisters are able to store the waste safely. Holtec has not provided sufficient information in the ER or SAR to make an accurate assessment of the safety of the canisters. Nor does the public even have access to the information because Holtec is withholding it as proprietary information.

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

Because of the high heat output of fuel in MPC-37 canisters, there is a long decay time before shipments of the radioactive waste can be shipped to the Holtec CIS facility.

The loading for the MPC-37 is quite complicated, so it may be an issue whether utilities can follow the prescriptions outlined by Holtec. One example is shown below in Figure 1.

Figure 1

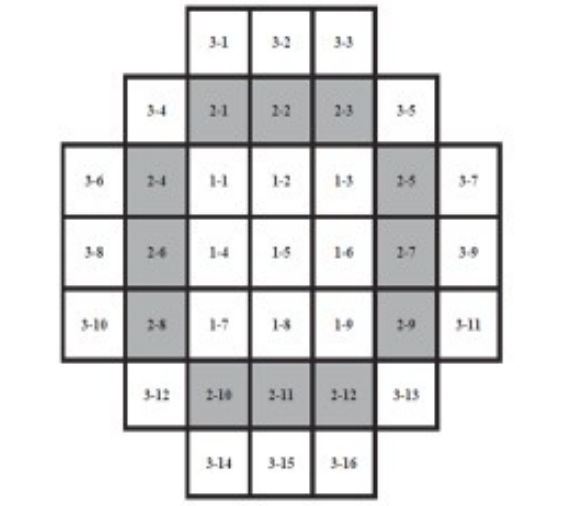


Figure 7.C.1

MPC-37 REGION-CELL IDENTIFICATION

The outer ring has cooler medium burnup fuel. The ring that is shaded will hold high burnup fuel (HBF). The inner square will have medium burnup fuel. The HBF cannot be placed in the outer ring because of the gamma emissions. For this fuel loading, according to Holtec, the cooling time in order to reach the heat output per assembly for this outer section is 43 years as shown in Table 1 below.

Table 1

MPC-37 Canister HI-STAR 190

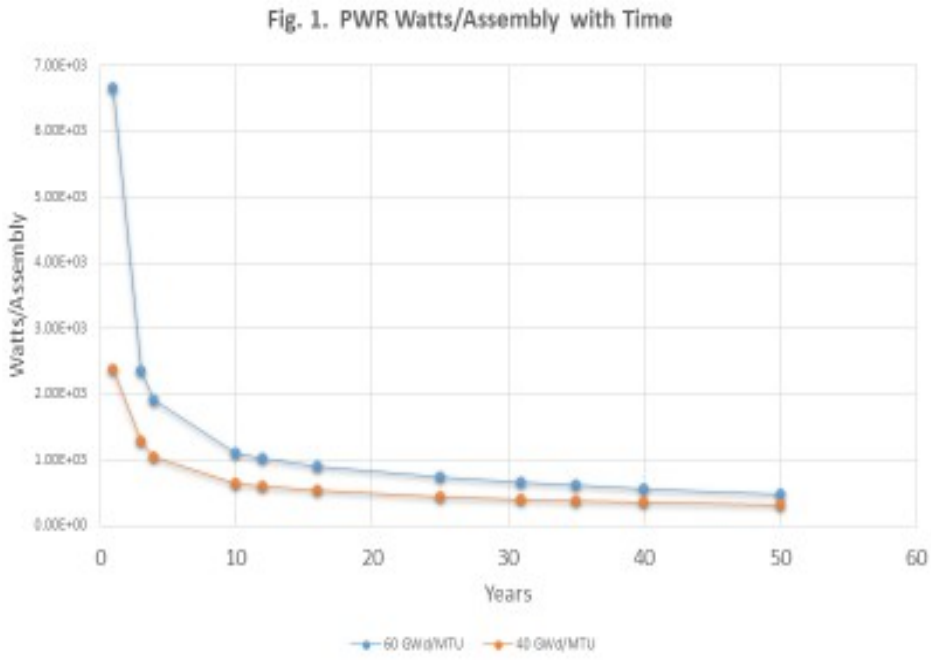
Region	**Max Heat Load per Assembly**	**Number of Assemblies per Region**	**Heat Load per Region (kW)**	**Cooling Time (yrs)**
1	0.38	9	3.42	43
2	1.7	12	20.4	7
3	0.5	16	8	24
		Total	31.82	

An alternative is to leave some of the storage locations empty. The cooing time for HBF, as shown in the table is seven years. The cooling time for the inner square is 24 years. So this raises the issue of when the reactors will be allowed to ship the MPC-37 canisters to the Holtec CIS facility.

Dr. Marvin Resnikoff has calculated the time for shipping, based on the third figure. Dr. Resnikoff took all of the radionuclides that are present in high burnup and medium burnup fuel. This is the same radionuclide mix used by Holtec. Roddy, J.W., et al., Physical and Decay Characteristics of Commercial LWR Spent Fuel (1986), found at inis.iaea.org/collection/NCLCollectionStore/_Public/17/065/17065841.pdf. As shown in Figure 2 below, in the first 10 years there is exponential decay but after 10 years

up to year 75, decay is quite gradual and it takes so long for fuel to cool down.

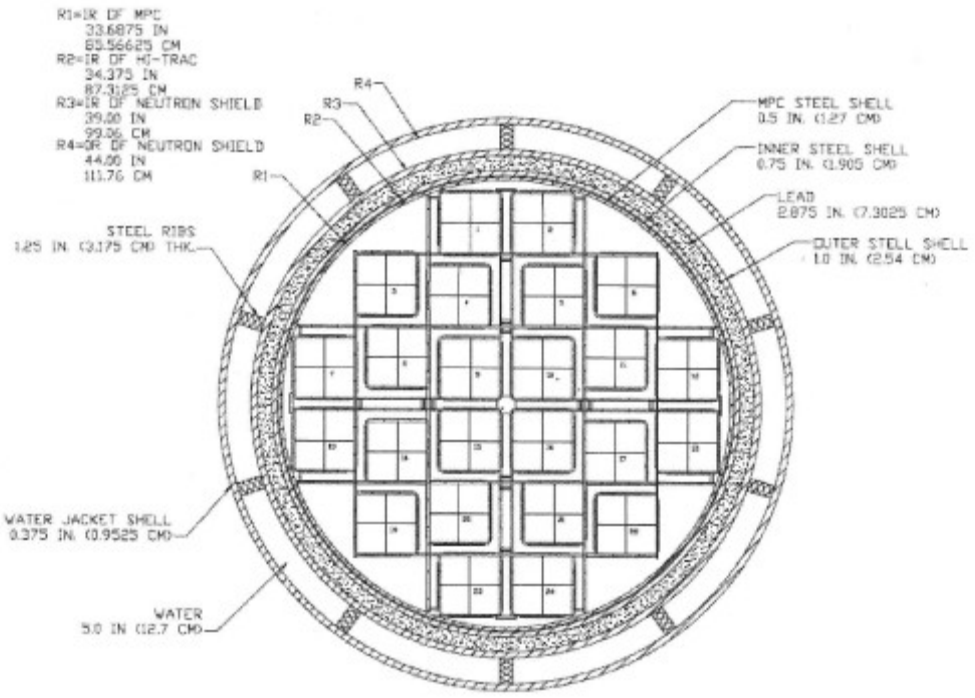
Figure 2



The basic reason why this happens is because of the decay of one of the plutonium isotopes, plutonium 241, to amercicium 241. Americium 241 has a long half life, 423 years, so it acts as a reservoir for the plutonium 241 decays. By year 75, americium 241 accounts for approximately 25% of the heat output.

Since the HI-TRAC CS cask details are not available because they are being withheld by Holtec as proprietary, the public cannot confirm the Holtec calculations nor confirm that safety is assured. For the HI-TRAC 100, the cask details are provided, as seen in Figure 3 below.

Figure 3



Note: The HI-TRAC 100 has 10 steel ribs as shown. The HI-TRAC 100D has 8 steel ribs evenly spaced with thickness as shown.

FIGURE 5.3.14: HI-TRAC 100 AND 100D TRANSFER CASK CROSS SECTIONAL VIEW (AS MODELED)

Dr. Resnikoff used this drawing, at least within a factor of 2, to verify the dose rates calculated by Holtec in the HI-STORM FSAR. Dr. Resnikoff has not been able to locate a

similar drawing for the HI-TRAC CS, which is constructed with concrete and steel shells, rather than lead and steel shells. The similar drawing for the HI-TRAC CS is being withheld by Holtec as proprietary.

CONTENTION 25

Sierra Club adopts all contentions presented by Don't Waste Michigan, Citizens Against Chemical Contamination, Public Citizen, San Luis Obispo Mothers for Peace, Nuclear Energy Information Service, Citizens' Environmental Coalition, and Environmentalists, Inc. in their Petition to Intervene in this proceeding.

Basis for Contention

Sierra Club and the above-named Intervenors have many of the same issues and concerns regarding the proposed Holtec CIS facility at issue in this proceeding. It would be in the interests of efficiency and fully litigating the issues in this proceeding to allow the parties to adopt each others' contentions.

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

Pursuant to 10 C.F.R. § 2.309(f)(3), Petitioner moves to adopt all contentions filed by Don't Waste Michigan, Citizens Against Chemical Contamination, Public Citizen, San Luis Obispo Mothers for Peace, Nuclear Energy Information Service, Citizens' Environmental Coalition, and Environmentalists, Inc. in this proceeding and to re-allege them as their own as if written herein. The parties request

the right to argue and present evidence on each others' contentions. Petitioner agrees that the above-named Intervenors shall act as the primary representative with respect to their contentions, and Sierra Club reserves the matter of requesting co-sponsorship or joint designation for a later time.

In a license transfer proceeding involving Indian Point, two intervenors, the Town of Cortland and Citizens Awareness Network sought to adopt each other's contentions. See Consol. Edison Co. (Indian Point, Units 1 and 2), CLI-01-19, 54 NRC 109, 131-33 (2001). The Commission held that where both petitioners have independently met the requirements to participate in the proceeding, the Board may provisionally allow petitioners to adopt each other's issues early in the proceeding. Id. at 132. That is the nature of Petitioners' request, should they be granted standing in this matter, and they so move.

CONCLUSION

Based on the foregoing, Sierra Club has established that it has standing to intervene in this licensing proceeding and that its contentions should be admitted. Therefore, Sierra Club should be permitted to intervene in this proceeding and is entitled under 10 C.F.R. § 2.309 to a hearing on its contentions.

/s/ *Wallace L. Taylor*

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