

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY**

In the Matter of)
)
HOLTEC INTERNATIONAL)
) Docket No. 72-1051
(HI-STORE Consolidated Interim Storage)
Facility for Interim Storage of Spent Nuclear Fuel))

**PETITION TO INTERVENE AND REQUEST FOR HEARING
OF NAC INTERNATIONAL INC.**

I. INTRODUCTION

In accordance with 10 C.F.R. § 2.309, NAC International Inc. (“NAC”) respectfully petitions to intervene in the above-captioned licensing proceeding and requests a hearing. In this proceeding, Holtec International (“Holtec”) is seeking a license pursuant to 10 C.F.R. Part 72 from the Nuclear Regulatory Commission (“NRC” or the “Commission”) to construct and operate the HI-STORE Consolidated Interim Storage Facility (“CISF”) in Lea County, New Mexico. If the NRC approves the application and issues the requested license, the CISF would store up to 8,680 metric tons of uranium of commercial spent nuclear fuel (“SNF”) in the HI-STORM UMAX Canister Storage System (“UMAX” casks) for a 40-year license term.

In NAC’s view, the license application presents certain radiological health and safety issues under the Atomic Energy Act (“AEA,” 42 U.S.C. §§ 2011 *et seq.*), and environmental issues under the National Environmental Policy Act (“NEPA,” 42 U.S.C. §§ 4321 *et seq.*), that must be carefully considered by the NRC. In particular, Holtec’s application states that Holtec’s UMAX cask, which is the centerpiece of the HI-STORE CISF, has the ability to “accommodate

every canister^[1] type licensed under different 10CFR72 docket and in use in the United States at this time.”² As conceived by Holtec, this would include canisters supplied by other vendors, such as NAC. As described below and in the accompanying affidavit by George C. Carver (“Carver Affidavit”), Holtec’s proposed CISF population of canisters designed and NRC-licensed by another vendor (such as canisters designed by NAC, for example) requires detailed evaluation of the cask-canister interaction, requiring Holtec to have authorized access to the proprietary design information developed by the original canister vendor, i.e., NAC. As explained in NAC’s proposed contentions, in the absence of such design information on NAC’s canisters, Holtec lacks the ability to perform NRC-required analyses to demonstrate that the CISF can safely store SNF held in NAC canisters³ during normal operation, as well as during off-normal and design basis accident events (“Design Basis Events”).⁴ Licensing the CISF out of compliance with AEA, NEPA, and NRC requirements will cause injury to NAC.

¹ To provide background, a spent fuel storage system consists primarily of a “canister,” which holds the SNF, and an outer “cask,” and the canister fits into the cask. See *Typical Dry Cask Storage System*, NRC.Gov, <https://www.nrc.gov/waste/spent-fuel-storage/diagram-typical-dry-cask-system.html> (last updated Aug. 9, 2017). The HI-STORM UMAX Canister Storage System, as applied in the CISF, would be below-grade, and canisters would be lowered into a “vertical silo” or cylindrical cavity surrounded by a steel liner resting on a base mat. See, *Presentation, Holtec & ELEA, LLC’s Vision for a Consolidated Interim Storage Facility*, CIS, slide 11 (undated), available at <http://www.ncsl.org/Portals/1/Documents/energy/nuclear-russell.pdf>. Section 1.3 of the Private Fuel Storage Safety Analysis Report (the primary precedent for development of consolidated interim storage facilities) presents additional background as to cask and canister systems. Private Fuel Storage, Safety Analysis Report § 1.3 (ADAMS Accession No. ML061590385).

² The NRC maintains Holtec CISF license application documents at the website: <https://www.nrc.gov/waste/spent-fuel-storage/cis/hi/hi-app-docs.html>. It appears that on September 12, 2018 the NRC uploaded an updated version of the Holtec HI-STORE CISF Safety Analysis Report (“SAR”) on ADAMS. The updated SAR was provided in Attachment 3 to the Holtec letter to NRC dated May 25, 2018, subject “Holtec International HI-STORE CIS (Consolidated Interim Storage Facility) License Application Responses to Requests for Supplemental Information,” and is entitled “Licensing Report on The HI-STORE CIS Facility.” The redacted version of the SAR can be found at ADAMS Accession No. ML18254A413. The quote is on page 32 (emphasis in original).

Holtec strongly advertises this point. See, e.g., *HI-STORE CISF*, Holtec Website, <https://holteciinternational.com/productsandservices/hi-store-cis/> (“[T]he HI-STORE CIS will accept a loaded Canister of any provenance: whether they are horizontally stored canisters in Areva’s NUHOMS or vertical canisters in NAC’s (a subsidiary of Hitachi Zosen) or the legacy canisters supplied by now-extinct suppliers – they all will be storable in HI-STORE CIS.”).

³ This same safety concern applies equally with all other non-Holtec canisters, for which Holtec is not the designer.

⁴ Off-normal and accident events constitute those postulated events a nuclear facility must be designed to withstand without loss of capabilities to ensure adequate protection of public health and safety. These are described further in Chapter 15 of NUREG 1567.

Except as stated in the specific contentions provided herein, NAC in principle does not oppose the issuance of a license for the proposed facility. In accordance with the Commission's regulations, NAC describes below its standing to participate in this proceeding and presents specific contentions for hearing.

II. STANDING

A. Standing as of Right

The Commission's Rules of Practice state that any "person whose interest may be affected by a proceeding and who desires to participate as a party must file a written request for hearing [or petition for leave to intervene] and a specification of the contentions which the person seeks to have litigated in the hearing." 10 C.F.R. § 2.309(a).

Under the general standing requirements of 10 C.F.R. § 2.309(d)(1), a petition for leave to intervene must state: (i) the name, address and telephone number of the petitioner; (ii) the nature of the petitioner's right under the Atomic Energy Act to be made a party to the proceeding; (iii) the nature and extent of the petitioner's property, financial or other interest in the proceeding; and (iv) the possible effect of any decision or order that may be issued in the proceeding on the petitioner's interest. In accordance with 10 C.F.R. § 2.309(d)(1)(i), NAC provides the following information:

Name of Petitioner: NAC International Inc.

Address: 3920 East Jones Bridge Road, Suite 200
Norcross, GA 30092

Telephone Number: (770) 447-1144

The Commission looks to judicial concepts of standing in determining whether a petitioner's interest may be affected by a licensing proceeding. *Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-98-13, 48 NRC 26, 31 (1998). These

concepts include whether the petitioner may suffer an injury in fact from the proceeding, that the injury is fairly traceable to the challenged action, and that the injury may be redressed by Commission actions. *Id.*; *Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Servs., LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), CLI-09-20, 70 NRC 911, 915 (2009). NAC has standing as of right under the applicable rules and precedent.

i. Injury in Fact

NAC is a leading nuclear fuel cycle technology company that provides storage systems for SNF at commercial reactors. NAC holds a number of NRC Certificates of Compliance (“CoCs”)⁵ for SNF storage systems approved under Part 72, which are currently in use in the United States. *See* 10 C.F.R. § 72.214. Fundamental to NAC’s existence and purpose is to promote the public safety through safe and reliable storage of SNF. Its storage systems or canisters are rigorously designed, analyzed, and tested before being approved by the NRC for storage of spent fuel under conditions specified in the CoC for the canister.

Much of NAC’s design information for its canisters is proprietary to NAC, including information submitted to the NRC in support of the CoC process that is withheld from public disclosure pursuant to 10 C.F.R. § 2.390 and otherwise protected by NAC as confidential and proprietary technology. The safety analysis reports provided by NAC to support its licensing are not stand-alone calculation packages or detailed engineering and design documents. They are reports that summarize proprietary evaluations to demonstrate compliance with the regulations for licensing purposes. NAC has not licensed or otherwise authorized anyone to furnish its proprietary design information to Holtec, thus this information is not available for use by Holtec.

⁵ As mentioned above, a NRC-issued CoC is an initial safety approval of a spent fuel cask/canister system for use in an ISFSI. They are described further below. *See infra* § III.B.ii.

NAC will thus be harmed if the license application is granted because NAC's proprietary canister designs, loaded with nuclear materials and SNF under contracts with NAC's customers, would be subsumed into and subject to Holtec's CISF design and its operation. If the requested license is issued without addressing NAC's concerns set forth below, Holtec would be unable to adequately evaluate or respond to normal operating situations and Design Basis Events (or other potential events) that affect NAC canisters stored at the CISF. NAC would likely then:

- (1) be urged by Holtec, reactor licensees, or the NRC to provide its proprietary information to Holtec to evaluate and cure such conditions as they arise; and/or
- (2) be subject to harm to its business reputation for safety and reliability, which is central to its existence and purpose; and/or
- (3) be subject to harm to its proprietary interest in its own NRC CoCs; and/or
- (4) be subject to potential assertions of financial responsibility by third parties.

All these harms constitute realistic harm to property and economic interests sufficient to demonstrate "injury in fact" necessary for standing. See *Oncology Servs. Corp.*, 38 NRC 130, 138 (1993) (recognizing a property interest of a company in its NRC license); *Quivira Mining Co.* (Ambrosia Lake Facility, Grants, New Mexico), CLI-98-11, 48 NRC 1, 7 (1998) (economic harms can constitute "injury in fact"); *Virginia Elec. & Power Co.* (N. Anna Power Station, Units 1 & 2), ALAB-342, 4 NRC 98, 100 (1976) (recognizing that potential loss of business reputation is a cognizable "injury-in-fact"). Essentially, NAC will be put on the hook for the faults in the Holtec CISF design and operating approach if the application goes through as proposed, even though NAC has no control over the manner in which Holtec handles the canisters stored at the CISF. These are concrete and particularized injuries traceable to the challenged action that would be redressed by a favorable decision.

ii. Zone of Interests

NAC's interests as described above are within the "zone of interests" protected under the AEA and NEPA⁶. NAC's standing arguments are directly related to the threat of radiological or environmental harm to its interests. The AEA expressly authorizes the Commission to accord protection from radiological injury to such interests. *Gulf States Utilities Co., et al.* (River Bend Station, Unit 1), CLI-94-10, 40 NRC 43, 48 (1994). The Commission has also made clear that NEPA can extend to protect economic interests subject to the threat of environmental harm. *Quivira Mining Co.*, CLI-98-11, 48 NRC at 9-10. The integrity and safety of NAC's proprietary information, products, and CoCs, and its financial well-being, are being put at risk by this application because the license sought would allow Holtec to store canisters supplied by NAC and other vendors without any involvement from those vendors, including through the consideration of critical design information to ensure the system as a whole can prevent a radiological release. The placement of spent fuel contents in NAC canister systems purchased by NAC's customers involves entrustment in NAC's product integrity and design experience, in accordance with a commercial transaction that Holtec is not a party to. The Holtec CISF licensing approach and proposed design of the CISF directly incorporates NAC's product into the CISF, and thus puts NAC's proprietary information, business reputation, property interest in its CoCs, and financial well-being at risk. The AEA and NEPA are concerned with protection from radiological and environmental injury to health and property, and the Commission's licensing scheme is intended to further those goals.

⁶ NAC is not interested merely as a "competitor," and acknowledges that mere competitive interest may be outside the protected zone of interests. *Quivira Mining Co.*, CLI-98-11, 48 NRC at 8.

iii. Real-World Consequences

Indeed, given how Holtec intends to incorporate NAC-designed technology directly into the CISF, and the implicit stake NAC will therefore have in the safe operation of the CISF (although without NAC's involvement or consent), it may be reasonable to treat NAC's unique real-world interests as grounds for standing, in the same vein as that of a co-licensee in other cases. *N. Atl. Energy Serv. Corp.* (Seabrook Station, Unit 1) & *Ne. Nuclear Energy Co.* (Millstone Station, Unit 3), CLI-99-27, 50 NRC 257, 262 (1999) (explaining that for petitioners directly linked to a facility and whose costs may rise and property come to harm from an action taken concerning that facility (such as co-licensees), standing is justified based alone on the "real-world consequences that conceivably could harm petitioners and entitle them to a hearing" (quoting *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-98-21, 48 NRC 185, 205 (1998))).

iv. Traceability & Redressability

The harms described above are "fairly traceable" to the licensing of the CISF, because Holtec requires this license in order to handle NAC-designed canisters within its own storage system at the CISF, and it is through this license proceeding that the NRC and the public will have an opportunity to fully evaluate the radiological and environmental implications of its "universal" cask approach. NAC's injury can be redressed by NRC actions, including the issuance of license conditions on the use of non-Holtec canisters in UMAX casks. *Sequoyah Fuels Corp.* (Gore, Oklahoma, Site Decommissioning), CLI-01-2, 53 NRC 9, 14 (2001) ("Redressability requires the intervenor to show that its actual or threatened injuries can be cured by some action of the tribunal").

Based on NAC's showing, NAC has standing as of right to participate in this proceeding.

B. Discretionary Intervention

As discussed above, NAC meets the requirements for standing as of right in this proceeding. However, even if it did not, the NRC allows for discretionary intervention under 10 C.F.R. § 2.309(e).⁷ The NRC sets forth factors weighing in favor of discretionary intervention in 10 C.F.R. § 2.309(e)(1). Pursuant to that regulation, the following factors support NAC's participation in this matter:

- (i) **Expertise & Safety Insights:** NAC's participation will assist in developing a sound record in the areas where NAC seeks to participate. NAC will provide direct, substantive insight on the application as it relates to NAC's proprietary systems and potential safety concerns surrounding Holtec's assertions that it is capable of storing all canister types currently licensed, including NAC canisters. NAC has more than just cask and canister development experience—it is also a significant participant in the development of a nearby consolidated interim storage facility led by Interim Storage Partners LLC.⁸ It is able to bring in real-world understanding of how NAC's proprietary information is required for development of a CISF, given that its canisters are to be used on site.

⁷ The concept of discretionary intervention is premised on the principle that federal agencies are not bound by judicial concepts of standing derived from Article III of the Constitution. *See Envirocare of Utah, Inc. v. Nuclear Regulatory Commission*, 194 F.3d 72,74 (D.C. Cir. 1999); *Sequoyah Fuels Corp. & Gen. Atomics* (Gore, Oklahoma Site), CLI-01-2, 53 NRC 9, 14 n.1 (2001).

⁸ Interim Storage Partners LLC is a joint venture between Waste Control Specialists LLC (49%) and Orano CIS LLC (51%) (Orano CIS LLC is wholly owned by Orano USA LLC (formerly AREVA Nuclear Materials)). *See* Interim Storage Partners LLC License Application § 1.4 (Rev. 2) (Apr. 2018) (ADAMS Accession No. ML18206A483). NAC is participating as a key vendor and key contractor in the project. *Id.* Ch. 2. Around the time of the initial filing in 2016 by Waste Control Specialists of the license application (succeeded as applicant by Interim Storage Partners in a revised license application in 2018), NAC agreed to partner with AREVA (now Orano) to join together with Waste Control Specialists in the "licensing, design, construction and operation" of the interim storage facility. *See* Press Release, AREVA and NAC Partner to Support WCS Used Fuel Consolidated Interim Storage Facility in Texas, <http://www.wcstexas.com/areva-nac-partner-support-wcs-used-fuel-consolidated-interim-storage-facility-texas/> (Mar. 6, 2018).

- (ii) **Substantial Business Interest:** The fact is that under the Holtec CISF licensing approach, NAC-designed canisters—a core of NAC’s business—would become assimilated into the CISF with no voice as to the matter by NAC. The safety and environmental risks this presents impact NAC’s intellectual property, reputation, interest in its CoCs, interest in the nearby Interim Storage Partners LLC consolidated interim storage project, and even carries potential risk of assertions of financial responsibility.
- (iii) **Interests Fundamentally Tied to Holtec CISF Licensing:** Any decision that may ultimately be issued in this proceeding, whether favorable or adverse, will affect all the NAC interests listed above and directly impact the core of NAC’s business. It is only appropriate that NAC have a voice as to the licensing of the CISF given this significant tie to the facility.

The factors potentially weighing against allowing intervention, set forth in 10 C.F.R. § 2.309(e)(2), have little or no weight here:

- (i) NAC has no other means or forum in which to fully address its safety and environmental interests in the NRC licensing of the proposed Holtec CISF. This NRC proceeding is the sole forum in which these issues will be fully and substantively addressed.
- (ii) NAC’s interests will not be addressed by any other party to the proceeding.
- (iii) NAC’s participation will not significantly broaden the scope of this proceeding or delay licensing of the project. NAC is just one of multiple parties filing petitions to intervene and requests for hearing, and only sets forth limited contentions on a specific topic, directly related to NAC itself.

In conclusion, NAC has an interest and the ability to support discretionary intervention. NAC's participation in this proceeding will assist the Commission in developing a sound record and thus NAC qualifies for discretionary intervention in addition to intervention as of right. Part I of the Carver Affidavit supports the above discussion as to standing and discretionary intervention.

III. NAC'S SPECIFIC CONTENTIONS

NAC puts forward three contentions.

A. Contentions & Summary of Bases

i. Safety-Related Contentions

The first two contentions challenge the safety analyses performed by Holtec in its license application, in particular in the HI-STORE "SAR."⁹

Contention 1: The Holtec CISF license application inadequately substantiates its design basis analyses concerning normal, off-normal, and accident events, which are required to demonstrate compliance with 10 C.F.R. Part 72, including Subparts E, F and G (and related acceptance criteria in NUREG 1567), as it lacks required design and safety information on the NAC canisters to be housed in the CISF UMAX casks.

Contention 2: The Holtec CISF license application omits technical information required under NRC regulations, including but not limited to 10 C.F.R. § 72.24, about the design and safety performance of NAC canisters within its UMAX casks.

The bases for these contentions are expanded upon below, and in the Carver Affidavit.

The underlying basis for both contentions is similar—Holtec is seeking a license for a facility that will store SNF from "the entire complement of canisters currently deployed at [Independent Spent Fuel Storage Installations ("ISFSIs")] around the country," including Holtec canisters, but also canisters that were designed and fabricated by non-Holtec vendors, such as NAC.¹⁰ These canisters all have different designs, basket internals, configurations, heat transfer

⁹ See *supra* note 2.

¹⁰ See Holtec CISF License Application Submittal Letter (Mar. 30, 2017) (ADAMS Accession No. ML17115A418).

properties, safety analyses; and will all react differently in normal, off-normal, and accident scenarios that could affect the SNF stored inside. Holtec does not have access to this third-party information, as it is proprietary to the original canister vendors and protected by confidentiality agreements, patents, trade secrets, and NRC regulations protecting the confidentiality of any submittals made to the agency pursuant to 10 C.F.R. § 2.390.

As captured in Contention 1, the lack of this information throws into doubt any of the general and site-specific analyses that touch on interactions between the UMAX cask and the stored canister and its contents, which is particularly an issue where there is an off-normal or accident event. Whenever a Design Basis Event occurs, such as listed in 10 C.F.R. § 72.122(b) or NUREG 1567 Chapter 15 (e.g., flood, fire, tornado), there is a need to analyze the impacts to the cask system as a whole to ensure their safe operation. *See id.* § 72.122(b)(2) (The applicant must demonstrate that structures, systems, and components important to safety can withstand design-basis events “without impairing their capability to perform safety functions.”).

This is something Holtec cannot do without information on the canister’s design and safety performance. This is explained in more detail in Part II of the Carver Affidavit (including ¶¶ 18-22; 25-27). To provide just a few examples:

- Evaluation of the system in response to a fire on the CISF site cannot be completed without access to NAC’s proprietary system internal heat transfer properties.
- The NAC canister system response to a seismic event, which is very dependent on the site-specific dynamic response of the constructed CISF, cannot be determined without access to NAC proprietary computational models.
- Holtec may not be able to perform with sufficient accuracy the necessary site-boundary radiological dose assessment (for example, Holtec could not replicate the source term) in

accordance with 10 C.F.R. §§ 72.104 and 72.106, even if it used the NAC system in its currently approved vertical configuration. Holtec does not have access to NAC's proprietary computational radiological shielding models, which were used to complete these evaluations for sites that use its own systems.

- In order to address Design Basis Event questions, beyond-design basis events, or nonconformances that may arise, licensees need access to detailed design and safety performance information about the cask and canister systems in use, pursuant to NRC regulatory requirements, including the Quality Assurance requirements set forth in Subpart G of 10 C.F.R. Part 72.

Incorporation by reference by Holtec of publicly available safety analysis reports for NRC cask certifications under Part 72 for non-Holtec casks (the reports, as described above, are mere summaries of far more extensive proprietary analyses) is insufficient.¹¹ Therefore, the lack of canister design and safety performance data renders the conclusions Holtec draws as to safety performance in normal operation, and around Design Basis Events, in the SAR unsupportable and insufficient to meet the regulatory requirements of 10 C.F.R. Part 72 (including Subparts E, F, and G).¹² These conclusions would not withstand the scrutiny of a hearing.

As expressed in Contention 2, the lack of information on non-Holtec canisters in the application also presents a problem in its own right, apart from impugning analyses in the Holtec CISF SAR. The analyses performed in the SAR are not the be-all and end-all of what a licensee must provide in order to get a Part 72 license. There is a basic requirement for every Part 72 license that the applicant have sufficient information across the board to evaluate new site-

¹¹ As discussed more below, the NRC staff has questioned past efforts by Holtec to rely on such publicly available materials in lieu of the underlying proprietary analyses, to which it appears the NRC staff has yet to receive a satisfactory response. *Infra* note 26.

¹² This issue extends to any instance in the SAR where Holtec tries to analyze a Design Basis Event, such as Section 6.5 of the SAR.

specific design basis situations that may arise. *See, e.g.*, 10 C.F.R. § 72.24(c)(3) (requiring that applicants have “descriptions of all structures, systems, and components important to safety, in sufficient detail to support a finding that the ISFSI or MRS will satisfy the design bases with an adequate margin for safety”); *id.* § 72.26 (requiring that the licensee provide technical specifications, including requirements on “items that would have a significant effect on safety if altered or modified, such as materials of construction and geometric arrangements”).¹³ Without proprietary information on the design and safety performance of the NAC canisters, Holtec does not have sufficient information to meet these basic regulatory requirements.

It is important to draw the licensing board’s attention to the precedent surrounding Private Fuel Storage, a past attempt by certain utilities to construct a precursor (although simpler) consolidated interim storage facility. In the complex litigation surrounding that proceeding, questions arose as to the ability of a cask to survive an event that needed to be considered for licensing purposes. The issue concerned whether a potentially credible event for that facility, an F-16 aircraft crash from a nearby Air Force base onto the facility, was adequately protected against so that the risk that a canister would rupture from the crash was mitigated. *Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-05-19, 62 NRC 403 (2005). To evaluate that event, and to therefore grant a license, the licensing board had to analyze the radiological consequences of an F-16 crash, with particular attention on assurance that the incident would not rupture the *interior canister*. *Id.* at 407, 412. To reach this conclusion, “the Board heard from twenty witnesses, who presented 225 exhibits, over the course of 16 days. The hearing transcript spans over 4500 pages.” *Id.* at 411. The hearing and resulting licensing board and Commission analyses focused on the credibility of the F-16 crash, but also

¹³ NUREG 1536 and NUREG 1567 also make clear throughout that the applicant must describe in the application the structures, systems, and components critical to safety “in sufficient detail” in to permit evaluation. *See, e.g.*, NUREG 1536 §§ 1.5.2, 3.5.1, 5.6; NUREG 1567 §§ 5.4.1, 6.6, 9.6.

on the actual consequences of the crash, and whether the interior canister would rupture (the key safety question) based on the properties of *the canister* and *how it interacted with the cask* during the event. *See id.* at 415-19. While a jet fighter crash may not be envisioned here, the basic message resonates—that in order to fully analyze a credible or Design Basis Event, a complete understanding of the cask and canister (and their interaction) is necessary, which requires the detailed information of the type held by the canister vendor itself.

ii. Environmental Contention

NAC also puts forward one contention challenging the adequacy of the applicant’s Environmental Report (“ER”).¹⁴

Contention 3: The Holtec CISF license application incorrectly omits a design alternatives analysis on the speculative grounds that the UMAX cask system is the only such system that is capable of including as contents all non-Holtec canister types.

NEPA requires an analysis of alternatives to the proposed action. 40 C.F.R. § 1505.1. This alternatives analysis entails an evaluation of “all reasonable alternatives” to the proposed Holtec facility design, and is the “heart of the environmental impact statement.” *Id.* § 1502.14. Holtec acknowledges outright in Section 2.4.1 of its ER that “[a] potential design alternative would be to use the AREVA, NAC, and EnergySolutions systems” at the CISF.

As captured in Contention 3, Holtec thereafter superficially declines to evaluate this self-proposed reasonable design alternative, on the grounds that “Holtec’s proprietary design is the only licensed technology with the universal capability to store all SNF from all commercial reactors.” This is an incorrect statement. Holtec’s UMAX cask CoC currently only permits it to store two types of canisters in the cask—MPC-37 and MPC-89—both of which are Holtec’s

¹⁴ Holtec CISF Environmental Report (Rev. 1) (ADAMS Accession No. ML18023A904).

pressurized water reactor and boiling water reactor fuel canisters, respectively.¹⁵ Although Holtec has for some time (since August 2016) sought an amendment for its CoC to include one type of Orano (TN Americas) cask, the NUHOMS 24PT1-DSC canister,¹⁶ this amendment has not been granted and has been held up by the NRC staff,¹⁷ and even if granted would not be sufficient to support the broad claim Holtec makes in the ER. Therefore, the basis for Holtec to decline to perform a design alternatives analysis is inaccurate as a matter of law.¹⁸

B. Discussion of Contention Admissibility Requirements

i. Specific Statement of Issue of Law or Fact & Explanation of Basis

The above contentions are concise statements that raise factual disputes with the SAR and ER, and legal disputes as to whether the SAR and ER, as drafted, meet 10 C.F.R. Part 72 regulatory requirements. 10 C.F.R. § 2.309(f)(1)(i). The discussion provided herein, as supported by the Carver Affidavit, sets forth a thorough explanation for the bases of the contentions. *Id.* § 2.309(f)(1)(ii).

ii. Demonstration that Contention is in Scope of Proceeding

The scope of a proceeding is set forth in the initial hearing notice.¹⁹ The hearing notice permits challenges to any part of the application, including the SAR and ER.²⁰ Indeed, there is

¹⁵ Holtec Certificate of Compliance for Spent Fuel Storage Casks, Amendment 2, at 2 (Jan. 6, 2017) (ADAMS Accession No. ML16341B080).

¹⁶ See Request for Amendment 3 of Holtec UMAX CoC No. 1040 (Aug. 30, 2016) (ADAMS Accession No. ML16250A393).

¹⁷ See *infra* note 26.

¹⁸ Such a design alternatives analysis, when performed, should not just consider technical feasibility of the UMAX cask to hold non-Holtec canisters, but also the economic benefits of an approach that does not rely on an ‘all-in-one’ cask system. The use of non-Holtec canisters in Holtec casks raises concerns, as explained above, which are reasonably expected to raise the risk profile and the short- and long-term socioeconomic costs of such an arrangement. COUNCIL ON ENVIRONMENTAL QUALITY, A CITIZEN’S GUIDE TO THE NEPA (Dec. 2007), available at https://ceq.doe.gov/get-involved/citizens_guide_to_nepa.html (“Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.”).

¹⁹ *Virginia Elec. & Power Co. d/h/a Dominion Virginia Power & Old Dominion Elec. Coop.* (N. Anna Power Station, Unit 3), LBP-10-17, 72 NRC 501, 511 (2010).

²⁰ *License Application; Opportunity to Request a Hearing and to Petition for Leave to Intervene*, 83 Fed. Reg. 32,919 (July 16, 2018).

no place elsewhere for NAC to go to challenge Holtec's asserted proposal to use the UMAX cask to store NAC (and other non-Holtec) canisters within the CISF.

An issue that is likely to arise in the proceeding is the role of the cask or canister CoC in evaluating the safety of a proposed CISF design, and how that affects the scope of the CISF proceeding. To provide some background, developing any ISFSI (including the Holtec CISF) essentially proceeds along two tracks. On one track, the casks and canisters themselves are approved initially by the NRC for use to store SNF, through a CoC process outlined in 10 C.F.R. Part 72, Subpart L, with the approval granted often by direct final rulemaking.²¹ Although attaining a CoC is an important and valuable accomplishment, the CoC itself is a generic approval that is based on an evaluation of limited issues. The second track is the more robust Part 72 proceeding for licensing an ISFSI—ISFSIs are generally licensed at reactor sites given the reactor operator's NRC-regulated capabilities, but away-from-reactor ISFSIs such as the proposed Holtec CISF require a specific NRC license.²²

Holtec is taking a similar two-track approach for permitting the CISF to store non-Holtec canisters. Holtec is limiting the canisters acceptable for use in the CISF to only those approved in the UMAX CoC.²³ While these are currently only Holtec canisters, in a separate proceeding (NRC Docket No. 72-1040) the applicant is seeking an amendment to its UMAX CoC to permit holding of certain non-Holtec canisters.²⁴ Then at the same time in this proceeding (Docket No. 72-1051) Holtec is seeking a specific license for its CISF, which is dependent inexorably on

²¹ See, e.g., *Direct Final Rulemaking Adopting Holtec UMAX CoC Amendment 2*, 81 Fed. Reg. 73,335 (Oct. 25, 2016).

²² The exception is where ISFSIs are generally licensed for those entities already operating nuclear power plants, and are therefore already heavily regulated by the NRC in the arena of spent fuel management. 10 C.F.R. § 72.210.

²³ Holtec CISF SAR Ch. 4.

²⁴ *Supra* note 16.

Holtec's success in obtaining UMAX CoC amendments in the future for non-Holtec canisters (i.e., beginning with CoC Amendment 3).

To make clear, this does not mean that analyses supporting the UMAX CoCs bound any of the analyses in the CISF (as Holtec appears to indicate in its SAR²⁵). The generic CoC analysis does not consider the full suite of technical information and safety issues to be evaluated when licensing an away-from-reactor ISFSI, especially one as complex as a consolidated interim storage facility. The CoC process was a product of Section 218(a) of the Nuclear Waste Policy Act of 1982 ("NWP") (codified in 42 U.S.C. § 10198(a)). At that time, Congress directed the U.S. Department of Energy and NRC to develop a system for generically approving casks for use in ISFSIs, but leaving site-specific analyses to individual license adjudications. 42 U.S.C. § 10198(a). The NRC, in implementing the NWP, did not go as far as the NWP directed—it only partially transferred Part 72's analytical requirements to the CoC proceeding. Essentially, for a CoC to be granted for a particular cask design, the applicant has to meet the requirements of 10 C.F.R. § 72.236. These requirements, while significant, leave additional analyses and site-specific analyses to be addressed through the Part 72 licensing process.

For a specific license for a CISF, this requires the full suite of analyses required for a site-specific license. Even for a general license, additional evaluations still need to be performed in accordance with 10 C.F.R. § 72.212 for general licensees. This requires general licensees to perform those additional evaluations in order to demonstrate the system is safe, given the unique conditions their site may present. Completion of these evaluations alone requires support from the cask vendor because the general licensee does not have access to the vendor's proprietary

²⁵ See, e.g., Holtec CISF SAR, tbl. 4.0.1 (stating locations of the UMAX CoC FSAR that Holtec asserts exceed regulatory requirements for permitting the CISF); *id.* § 6.4.1 (stating that the thermal analysis for the CISF "will be bounded by the generic analysis in the HI-STORM UMAX docket"); *id.* § 15.3 (stating that certain design basis accidents are "bounded" by the UMAX CoC FSAR).

information, which is needed to complete these reviews. *See* Carver Affidavit ¶¶ 23-24. The informational and analytical requirements for a specifically licensed CISF are even greater, and consider the requirements provided under 10 C.F.R §§ 72.24, 72.26, and 72.122, among other regulations.

In sum, while a CoC can be important to the licensing process for a CISF, the CoC alone cannot provide the required generic or site-specific analyses to support the CISF application in full. Holtec appears to be trying to tie the two tracks together in a manner that stretches the purposes of the Part 72 licensing framework. If anything, Holtec's effort to expand the scope of its CoC to include other canisters only highlights the challenges it is facing trying to use generic CoCs from other cask vendors as a basis for completing required safety analyses.²⁶

Taking any other position would render the safety analysis in the CISF application little more than an empty shell, to be filled in by the analyses done in support of the UMAX CoC. Instead, the Part 72 licensing proceeding serves as a separate forum, and actually the primary forum, to address the safe operation of the CISF. NAC has been voicing its concerns with Holtec's claims regarding the UMAX cask on both fronts.²⁷ However, this CISF proceeding is the only one that allows NAC the opportunity to challenge the Part 72-specific analyses Holtec has performed for the CISF licensing basis as inadequate.

²⁶ *See, e.g.*, NRC Request for Supplemental Information, Enclosure, Amendment 3 to UMAX CoC (Jan. 31, 2017) (ADAMS Accession No. ML17023A060) (questioning Holtec's effort to rely on publicly available information to justify adding an Orano cask to the UMAX CoC, considering "variations in the licensing bases between the 24PT1-DSC and the UMAX system"); Handout for Public Meeting, Amendment 3 to UMAX CoC (June 7, 2017) (ADAMS Accession No. ML17157B401) (raising questions on Holtec's approach for expanding the scope of the UMAX CoC without proprietary information from AREVA, noting, for example, that Holtec's surrogate cask approach "does not provide the required licensing design information").

²⁷ *See, e.g.*, Letter by NAC to NRC (Aug. 10, 2017) (ADAMS Accession No. ML17226A036) (raising issues with claims made by Holtec in CISF application as to UMAX cask); Letter by NAC to NRC (May 19, 2017) (ADAMS Accession No. ML17143A276) (informing the NRC staff as to issues with Holtec's claim to use "conservative reverse engineering" to expand the scope of UMAX CoC to other casks); Letter by AREVA TN (now Orano) to NRC (Jan. 20, 2016) (ADAMS Accession No. ML16029A163) (questioning how Holtec would be able to expand the scope of its UMAX CoC to accommodate non-Holtec canisters); *see also* NRC Letter to NAC (Oct. 17, 2017) (ADAMS Accession No. ML17269A013) (responding to NAC's August 10, 2017 letter); NRC Letter to NAC (July 5, 2017) (ADAMS Accession No. ML17163A031) (responding to NAC's May 19, 2017 letter).

iii. Concise Statement of the Alleged Facts or Expert Opinion

This Petition and the Carver Affidavit provide a concise statement of the alleged facts and expert opinion in support of Contentions 1 and 2. Contention 3 is supported by reference to legal documents and publicly available sources.

Moreover, for Contentions 2 and 3, which are contentions of omission,²⁸ NAC is not required to provide supporting facts or expert opinion, as long as it “identif[ies] the regulatively required missing information.” See *Crow Butte Res., Inc.* (in Situ Leach Facility, Crawford, Nebraska), LBP-15-11, 81 NRC 401, n.241 (2015) (quoting *Calvert Cliffs 3 Nuclear Project* (Calvert Cliffs Nuclear Power Plant, Unit 3), LBP-09-4, 69 NRC 170, 190 (2009) ((internal quotation marks omitted))). This Petition and the Carver Affidavit identify the relevant regulatory gaps in the Holtec CISF license application.

iv. Materiality

The three contentions raise material issues with the Holtec application. The two Safety contentions allege that the SAR fails to meet all the requirements of 10 C.F.R. § 72.122 and implementing guidance. Holtec would therefore not be able to meet the requirements of 10 C.F.R. § 72.40 to attain a license for the CISF insofar as it seeks authority to store NAC-designed canisters on the site. The environmental contention raises deficiencies in the applicant’s alternatives analyses. It would require amendment of the ER to bring it into compliance with NEPA.

v. Genuine Dispute

All of NAC’s contentions present a genuine dispute on a material issue of fact or law. The core of the “genuine dispute” requirement is one of specificity in the petition to intervene—

²⁸ Contention 3 can be interpreted as a contention alleging that the ER is inaccurate (because the basis for omitting a design alternatives analysis is incorrect and inadequate), or as a contention of omission (as the Holtec ER simply omits a design alternatives analysis, albeit on an incorrect and inadequate basis).

that the petition explain what is wrong in the application and why it results in a material issue— as opposed to asserting “little more than speculation.” *FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), LBP-15-1, 81 NRC 28, 37-38 (2015) (internal quotations omitted).

NAC’s Petition repeatedly states with specificity what sections of the SAR and ER are at issue, as well as what regulatory requirements they fail to meet. The Petition also explains why such failures raise material issues, because they bring the application significantly out of compliance with the above-stated NRC regulations and provisions of NEPA.

These claims are supported by expert opinion. The presence of factual analysis and expert opinion lends support to a finding that there is a genuine dispute with the application. *See id.* (explaining the link between providing factual basis for a contention, and whether the contention raises a genuine dispute with the application).

IV. CONCLUSION

NAC respectfully requests that its Petition be granted and that its contentions proposed herein be admitted for hearing.

Respectfully Submitted,

/s/ Signed (electronically) by Sachin Desai

Sachin Desai

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Counsel for NAC International Inc.

Robert E. Helfrich, General Counsel

NAC International Inc.

Dated in Washington, D.C.

September 14, 2018

Enclosures

- 1) Certificate of Service (E-Filing)
- 2) Affidavit of George C. Carver in Support of Petition to Intervene and Request for Hearing of NAC International Inc.

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY**

_____)	
In the Matter of)	
)	
HOLTEC INTERNATIONAL)	
)	Docket No. 72-1051
(HI-STORE Consolidated Interim Storage)	
Facility for Interim Storage of Spent Nuclear Fuel))	
_____)	

CERTIFICATE OF SERVICE

I hereby certify that on September 14, 2018 copies of the above **Petition to Intervene and Request for a Hearing of NAC International Inc.**, and of the **Notice of Appearance of Sachin Desai, Amy C. Roma, Daniel F. Stenger, for NAC International Inc.** (filed this same day at approximately 2:50 PM Eastern Time), have been served through the U.S. Nuclear Regulatory Commission E-Filing system on the participants of the above-captioned proceeding.

Respectfully Submitted,

/S/ Signed (electronically) by Sachin Desai
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Counsel for NAC International Inc.

September 14, 2018

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY**

In the Matter of)	
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HOLTEC INTERNATIONAL)	
)	Docket No. 72-1051
(HI-STORE Consolidated Interim Storage)	
Facility for Interim Storage of Spent Nuclear Fuel))	
)	

**AFFIDAVIT OF GEORGE C. CARVER IN SUPPORT OF
PETITION TO INTERVENE AND REQUEST FOR HEARING
OF NAC INTERNATIONAL INC.**

I, George C. Carver, do hereby state as follows:

1. I am Vice President, Engineering & Licensing for NAC International Inc. (“NAC”), located at 3920 East Jones Bridge Road, Suite 200, Norcross, GA 30092. In this role, I am responsible for all design, engineering processes, licensing actions and engineering deliverables in support of all NAC dry cask storage and/or transportation projects. I have over 35 years of engineering and design experience, with over 28 years focused in the nuclear fuel handling and spent fuel cask industry. My statement of professional qualifications is attached to this affidavit.

2. As explained in NAC’s Petition to Intervene and Request for Hearing (the “Petition”), Holtec International (“Holtec”) is seeking a Part 72 license for its Consolidated Interim Storage Facility (“CISF”), with the stated goal that the facility will be able to store essentially all canisters across the United States containing spent nuclear fuel (“SNF”) within its HI-STORM UMAX cask system (“UMAX cask”), even if the canisters were designed and fabricated by non-Holtec vendors such as NAC.

3. The site-specific analyses and technical information contained in the Safety Analysis Report supporting the Holtec CISF application do not adequately support Holtec's license application. Storing canisters of a non-Holtec vendor in a Holtec cask requires detailed evaluation of the cask-canister interaction, requiring access to proprietary design information held by the original canister vendor. In the absence of such design and safety performance information, Holtec lacks the ability to perform NRC-required analyses to demonstrate that the CISF can safely store SNF held in NAC canisters during normal operation, as well as during off-normal and design basis accident events ("Design Basis Events").

4. This affidavit has two Parts. Part I addresses NAC's standing to participate in this proceeding. Part II addresses the proffered contentions.

I. STANDING & DISCRETIONARY INTERVENTION

5. NAC is a leading nuclear fuel cycle technology company that provides storage systems for SNF at commercial reactors. NAC holds a number of NRC Certificates of Compliance ("CoCs") for SNF storage systems approved under Part 72, which are currently in use in the United States. Fundamental to NAC's existence and purpose is to promote the public safety through safe and reliable storage of SNF. Its storage systems or canisters are rigorously designed, analyzed, and tested before being approved by the NRC for storage of spent fuel under conditions specified in the CoC for the canister.

6. Much of NAC's design information for its canisters is proprietary to NAC, including information submitted to the NRC in support of the CoC process that is withheld from public disclosure pursuant to 10 C.F.R. § 2.390 and otherwise protected by NAC as confidential and proprietary technology. The safety analysis reports provided by NAC to support its licensing are not stand-alone calculation packages or detailed engineering and design documents. They are

reports that summarize proprietary evaluations to demonstrate compliance with the regulations for licensing purposes. NAC has not licensed or otherwise authorized anyone to furnish its proprietary design information to Holtec, thus this information is not available for use by Holtec.

7. NAC will thus be harmed if the license application is granted because NAC's proprietary canister designs, loaded with nuclear materials and SNF under contracts with NAC's customers, would be subsumed into and subject to Holtec's CISF design and its operation. If the requested license is issued without addressing NAC's concerns set forth below, Holtec would be unable to adequately evaluate or respond to normal operating situations and Design Basis Events (or other potential events) that affect NAC canisters stored at the CISF. NAC would likely then:

- (1) be urged by Holtec, reactor licensees, or the NRC to provide its proprietary information to Holtec to evaluate and cure such conditions as they arise; and/or
- (2) be subject to harm to its business reputation for safety and reliability, which is central to its existence and purpose; and/or
- (3) be subject to harm to its proprietary interest in its own NRC CoCs; and/or
- (4) be subject to potential assertions of financial responsibility by third parties.

8. Essentially, NAC will be put on the hook for the faults in the Holtec CISF design and operating approach if the application goes through as proposed, even though NAC has no control over the manner in which Holtec handles the canisters stored at the CISF.

9. The integrity and safety of NAC's proprietary information, products, and CoCs, and its financial well-being, are being put at risk by this application because the license sought would allow Holtec to store canisters supplied by NAC and other vendors without any involvement from those vendors, including through the consideration of critical design information to ensure the system as a whole can prevent a radiological release.

10. The placement of spent fuel contents in NAC canister systems purchased by NAC's customers involves entrustment in NAC's product integrity and design experience, in accordance with a commercial transaction that Holtec is not a party to. The Holtec CISF licensing approach and proposed design of the CISF directly incorporates NAC's product into the CISF, and thus puts NAC's proprietary information, business reputation, property interest in its CoCs, and financial well-being at risk.

11. NAC has more than just cask and canister development experience—it is also a significant participant in the development of a nearby consolidated interim storage facility led by Interim Storage Partners LLC. It is able to bring in real-world understanding of how NAC's proprietary information is required for development of a CISF, given that its canisters are to be used on site.

12. The fact is that under the Holtec CISF licensing approach, NAC-designed canisters—a core of NAC's business—would become assimilated into the CISF, with no voice as to the matter by NAC. The safety and environmental risks this presents impact NAC's intellectual property, reputation, interest in its CoCs, interest in the nearby Interim Storage Partners LLC consolidated interim storage project, and even carries potential risk of assertions of financial responsibility.

13. Any decision that may ultimately be issued in this proceeding, whether favorable or adverse, will affect all the NAC interests listed above and directly impact the core of NAC's business. It is only appropriate that NAC have a voice as to the licensing of the facility given this significant tie to the CISF.

II. STATEMENTS ON PROFFERED CONTENTIONS

Background to NRC Part 72 Licensing Requirements

14. Independent spent fuel storage installations (“ISFSIs”) are licensed per the requirements of 10 C.F.R. Part 72. Away-from-reactor ISFSIs, such as the Holtec CISF, require a specific license under Part 72 and have to meet all the requirements set forth in 10 C.F.R. Part 72. At-reactor ISFSIs (those onsite adjacent to nuclear power plants and using NRC certified casks) are generally licensed under Part 72 and have to meet more limited regulatory requirements.

15. Subpart B of Part 72 (“License Application, Form, and Contents”) sets forth what a away-from-reactor ISFSI license application, such as a CISF license application, must contain. Among these regulations, 10 C.F.R. § 72.24 requires the applicant to provide detailed design information about all aspects of the CISF, including “descriptions of structures, systems, and components important to safety, in sufficient detail” to support the NRC’s review and adequate protection finding.

16. Subpart E of Part 72 (“Siting Evaluation Factors”) sets forth a host of analyses that away-from-reactor ISFSI applicants must provide to demonstrate that site conditions have been properly evaluated against radiological safety concerns. This includes a radiological dosage analysis per 10 C.F.R. § 72.106. Subpart F (“General Design Criteria”) sets forth the safety standards the facility is to be measured against, including the requirement in 10 C.F.R. § 72.122(b) that the facility withstand Design Basis Events (such as a flood, fire, tornado).

17. NUREG 1567 provides guidance on the NRC’s safety review of a specific license application for a commercial ISFSI. NUREG 1536 provides guidance for the NRC staff’s much more limited safety review of an at-reactor generally licensed ISFSI.

Need for Proprietary Canister Information to Meet Part 72 Licensing Requirements

18. Persons seeking either a specific or general license under Part 72 need to have access to proprietary information about the canister system they want to use at the site in order to meet NRC regulatory requirements.

19. A CISF license applicant who lacks any commercial arrangements for access to a canister-vendor's proprietary licensing and design basis data cannot properly support a Part 72 application or meet the above regulatory requirements.

20. Merely "incorporating by reference" publicly-available, non-proprietary information pursuant to 10 C.F.R. § 72.18 would fail to include analytical bases behind the publicly available information, which would be required to demonstrate compliance with NRC regulations. Publicly available final safety analysis reports on ADAMS are not stand-alone calculation or engineering packages. They are reports that merely summarize results in order to demonstrate compliance with regulatory standards.

21. NAC has personal experience in understanding what goes into licensing an away-from-reactor ISFSI such as a CISF, as we are participants in Interim Storage Partners LLC's efforts to license a CISF in Andrews County, TX, located approximately 39 miles from Holtec's CISF site. The Interim Storage Partners LLC license application is currently under review by the NRC. Throughout this licensing action, NAC has provided evaluations to support the NRC's review that would be impossible to do without access to our own proprietary information. NAC has also authorized Interim Storage Partners LLC to access NAC proprietary information, as applicable, to support Interim Storage Partner's licensing effort. NAC staff periodically travel to Andrews County, TX and the Interim Storage Partners LLC site to assist in or perform such evaluations.

22. Specific to the Holtec CISF proceeding, Holtec would need NAC's proprietary canister information to even try to support a Part 72-compliant licensing analysis demonstrating that an NAC customer's fully loaded vertical NAC canister could be stored within a UMAX cask at the Holtec CISF.

- a. A safety analysis for a fire accident (under NUREG 1567 Chapter 15), for example, is different for a Holtec underground system compared with an NAC surface pad vertical system. Resolution of this difference cannot be obtained by simply applying a boundary evaluation. Instead, the evaluator would need knowledge of proprietary system internal heat transfer properties, to accurately identify the peak cladding temperature.
- b. The NAC canister system response to a seismic event, which is very dependent on the site-specific dynamic response of the constructed CISF, cannot be determined without access to NAC proprietary computational models.
- c. In addition, Holtec may not be able to perform with sufficient accuracy the necessary site-boundary radiological dose assessment (for example, Holtec could not replicate the source term) in accordance with 10 C.F.R. §§ 72.104 and 72.106, even if it used the NAC system in its currently approved vertical configuration. Holtec does not have access to our proprietary computational radiological shielding models, which were used to complete these evaluations for sites that use our systems.

Insufficiency of Relying on Certificates of Compliance for CISF Licensing

23. NUREG 1567, which guides the CISF licensing process, requires evaluation of operating site conditions and Design Basis Events. These evaluations are not bounded by the analyses performed in order to attain a CoC pursuant to the requirements of the much simpler NUREG

1536. Therefore, additional analyses will need to be performed as part of the Holtec CISF application, and mere reference to a UMAX cask CoC safety analysis is insufficient. Analyses unique to a specifically-licensed ISFSI, such as CISF, include, but are not limited to, analyses of fuel integrity (i.e., peak cladding temperature), canister structural integrity, criticality, seismic responses, and beyond-design-basis events which are specific to the license/site (e.g., landslides or an aircraft impact). These analyses necessitate access to proprietary information from the canister vendor.

24. Even for at-reactor ISFSIs using certified casks, which have to meet the more basic general license requirements of 10 C.F.R. § 72.212, licensees must perform additional evaluations beyond what may have been done for a CoC. These site-specific analyses require support from the cask/canister vendor. NAC is very familiar with this as we have many clients in the United States that implement our systems at reactor sites under the 10 C.F.R. § 72.210 general license, and still require our support to perform additional licensing analyses.

Need for Proprietary Canister Data to Address Design Basis Events Questions, Beyond Design Basis Events, and Nonconformances

25. In order to address design basis event questions, beyond-design basis events, or nonconformances that may arise, licensees need access to detailed design and safety performance information about the cask and canister systems in use, pursuant to NRC regulatory requirements, including the Quality Assurance (“QA”) requirements of set forth in Subpart G of 10 C.F.R. Part 72. Such analyses would be necessary to ensure operability and public safety after certain Design Basis Events, or to address nonconformances under 10 C.F.R. § 72.48 (the equivalent of 10 C.F.R. § 50.59 in the reactor space), § 72.170 (nonconforming materials, parts, and components), and § 72.146 (design control), among other regulatory requirements.

26. In the event an unanalyzed condition arose, a quick determination of the system's condition and operability status (as well as reportability of the event to NRC) is imperative under NRC QA requirements. Performing such analyses requires access to proprietary design data on the container in the cask/canister system. In the normal circumstance, the storage system designer (or customer, through the designer) will have immediate access to the analytical details allowing preparation of the necessary justification(s) or operability determination that the system is indeed safe, or present the necessary alternatives to place the system into a safe condition. Conservatism, embedded within the system designer's actual analysis and not explicitly described in a CoC safety analysis report, would be of great value in determining the ultimate condition of the package. A CISF applicant lacking access to the system designer's proprietary design and licensing-basis information, and who attempts licensing via "incorporation by reference" without support from the original vendor, will be incapable of addressing scenarios like these, and therefore meeting regulatory requirements.

27. Nonconformances are resolved through evaluations that determine whether the cask can be used "as-is" still, or has to be repaired after the nonconformance is revealed—these evaluations and dispositions are not addressed in any generic design or CoC safety analysis reports. Changes to address the conditions are often addressed through 10 C.F.R. § 72.48 and can be stand-alone changes for a single cask/canister system. Each of these unique dispositions is supported by the system designer through calculations, analyses, or white papers that validate the adequacy and acceptability of the change relative to the unit's original licensing basis. Addressing non-conformances and their required 10 CFR 72.48 determinations will require access to a higher level of analytical detail than that provided in a CoC safety analysis report. Applied to the Holtec CISF, Holtec does not have adequate information to perform NRC-

required evaluations of the condition of our canisters in accordance with how they were approved via our CoCs (i.e., Methods of Evaluation, computational models, etc.).

- a. In a real world example, a number of SNF storage systems had been manufactured and a high percentage of them had been loaded with fuel and placed into storage. It was thereafter discovered that the vendor's approach to helium leak testing was not in accordance with the cask regulatory basis in the CoC. Exercise of Enforcement Discretion, EA-09-190 (Aug. 5, 2009) (ADAMS Accession No. ML092180140). To disposition the non-conforming canisters to the satisfaction of the NRC, analysis had to be performed to determine what the worst possible helium quantity could be and what effects it would have on the fuel. This evaluation could not be performed with only safety analysis report information. The vendor in that case provided its own proprietary information to support the necessary evaluations. Holtec Reply to EA-09-190 (Sept. 2, 2009) (ADAMS Accession No. ML092470363; Attachments 1 and 2).
- b. Another nonconformance event involved the handling of a loaded fuel canister and the subsequent placement of the canister into a storage cask. During placement, the canister got hung up and operations continued lowering the load without noticing the slack rigging. The NRC has chartered a special inspection for this near-miss drop event. *See* Inspection Charter to Evaluate the Near-Miss Load Drop Event At San Onofre Nuclear Generating Station (Aug. 17, 2018) (ADAMS Accession No. ML18229A203). If the operator lacked access to the full design and analysis for the canister, it could only estimate the condition of the canister and the fuel inside. As a related example, something as simple as a 16-inch drop due to an operational error would not be covered by the design basis 1-foot cask drop event evaluated in a safety

analysis report. Additional analysis using the design bases modeling, however, would allow a quick and concise resolution to any questions regarding the safety of the loaded package in such a case.

28. I declare under penalty of perjury that my statements set forth above and in my statement of professional qualifications attached hereto are true and correct to the best of my knowledge, information, and belief.



George C. Carver

Executed in Accordance with 10 CFR § 2.304(d)

George C. Carver
Vice President, Engineering & Licensing
NAC International Inc.
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Norcross, GA 30092
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Executed on the 14th Day of September, 2018



GEORGE CARVER – VICE PRESIDENT, ENGINEERING AND LICENSING

Mr. Carver has over 35 years of engineering and design experience with over 28 years focused in the nuclear fuel handling and spent fuel cask industry. Mr. Carver currently serves as the Vice President, Engineering & Licensing for NAC. In this capacity, he is responsible for all design, engineering processes, licensing actions and engineering deliverables in support of all NAC dry cask storage and/or transportation projects. Mr. Carver coordinates the activities of a broad spectrum of engineering professionals who support him in this capacity.

Experience Highlights:

- 35 years of engineering and design experience, 28 years on dry cask storage and/or transport projects for the nuclear industry.
- Led engineering work for PWR spent fuel storage and transport system projects, and responsible for over 350 U.S. NRC-licensed cask systems provided at PWR nuclear power plants.
- Experienced project lead manager with in-depth technical and management expertise.

Selected Relevant Experience

NAC International, Vice President, Engineering & Licensing (current title)

Prior to his current position, Mr. Carver served as Director of Projects. In this role he provided technical guidance, schedule adherence and budget management for a team of Project Managers in support of NAC's licensing, hardware and engineering deliverables. He directed project management activities, and guided for NAC's team of analysts and designers in support of NAC's MAGNASTOR Spent Fuel Storage U.S. NRC licensing submittal.

Mr. Carver's previous position was Fabrication Manager, where he was involved in the delivery of several large hardware orders, including:

- Delivery of two NAC-STC Transport/Storage Casks for CNEIC
- Delivery of MPC Transfer Cask, Adapter, and Lifting Equipment for Yankee Rowe
- Delivery of UMS Transfer Cask, Adapter, Lifting equipment and support Systems for Maine Yankee
- Delivery of 16 MPC Vertical Concrete Cask Liners for Yankee Rowe
- Delivery of 43 MPC Vertical Concrete Cask Liners for Connecticut Yankee
- Delivery of MPC Transfer Cask, Adapter, and Lift equipment for Connecticut Yankee
- Delivery of Second UMS Transfer Cask for Maine Yankee
- Delivery of UMS Transfer Cask and Adapter for Arizona Public Services
- Delivery of Second Transfer Cask for Connecticut Yankee
- Delivery of UMS Transfer Cask and Adapter for Duke-McGuire
- Delivery of additional, support-related, fabricated components

Prior to his position as Fabrication Manager, Mr. Carver's position was Design Manager, where he was involved in several cask design teams responsible for developing the following equipment:

- Design of the NAC LWT Legal Weight Truck Cask
- Design and analysis of the NAC CTC Transportation Cask and ancillary support equipment
- Design and analysis of the NAC STC Dual Purpose Cask
- Design and analysis of NAC MPC and NAC-UMS Multipurpose Fuel Storage Systems
- Operations support for the NAC Spent Fuel Movement Programs



- Design of NAC's BWR Fuel Consolidation Design Project for the Electric Power Research Institute (EPRI) and the Empire State Electric Energy Research Corporation (ESEERCO)
- Design and Fabrication of Research Reactor Dry Transfer System
- Design and Fabrication of equipment for the Iraq Fuel Movement Program
- Design and Fabrication of equipment for DPRK Fuel Canning Operations
- Design of the NAC UMS-X High Capacity Canisters for the NAC-UMS

As the Design Manager, Mr. Carver was also responsible for:

- Supporting the Marketing & Business Development division with concepts and layouts for proposals
- Operations engineering support for spent fuel shipments
- Generating designs to meet the needs and requirements of in house projects and reports
- Stress analysis of proposed designs following all applicable codes and standards
- Working with the Nuclear, Structural and Licensing divisions to produce the highest quality designs
- Coordinating the production of engineering drawings to support those designs in a manner that met internal quality requirements as well as meeting industry or customer dictated standards

Advanced Manufacturing Systems, Inc. (AMS), Applications Engineer

In this position at AMS, Mr. Carver was involved in the design, prototype, fabrication and installation of a wide range of automated systems. He worked with numerous control systems incorporating various types of sensing arrangements, including Allen Bradley and General Electric Programmable controllers.

Education

- Southern College of Technology, B.S., Mechanical Engineering Technology
- Southern College of Technology, A.S., Architectural Engineering Technology