SHAWN GIBBY
Vice President

Nuclear Engineering
526 South Church Street, EC-07H
Charlotte, NC 28202
704 519-5138
Shawn.Gibby@duke-energy.com

Enclosures 3, 5 and 7 Contain ~~Proprietary Information~~
~~Withhold in Accordance with 10 CFR 2.390~~

Serial: RA-22-0080
April 7, 2022

10 CFR 72.7
10 CFR 72.212
10 CFR 72.214

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Catawba Nuclear Station, Units Nos. 1 and 2
Docket Nos. 50-413, 50-414
Renewed Facility Operating License Nos. NPF-35, NPF-52
Independent Spent Fuel Storage Installation Docket No. 72-45

McGuire Nuclear Station, Unit Nos. 1 and 2
Docket Nos. 50-369, 50-370
Renewed Facility Operating License Nos. NPF-9, NPF-17
Independent Spent Fuel Storage Installation Docket No. 72-38

Subject: **Request for an Exemption to the Requirements of Certificate of Compliance No. 1031 for the NAC MAGNASTOR Storage System**

References: U.S. Nuclear Regulatory Commission (NRC) Certificate of Compliance (CoC) No. 1031 for the NAC International MAGNASTOR Cask System, Amendment No. 7

Ladies and Gentlemen:

Pursuant to 10 CFR 72.7, "Specific Exemptions," Duke Energy Carolinas, LLC (Duke Energy) requests an exemption to the requirements of 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214 for 74 MAGNASTOR Vertical Concrete Casks (VCCs) as listed in Enclosure 1. NAC International (NAC), the Certificate of Compliance (CoC) holder for the MAGNASTOR storage system, recently brought to the attention of Duke Energy a Nuclear Regulatory Commission (NRC) identified noncompliance issue with the fabrication of VCCs delivered to Duke Energy.

The issue was identified during an NRC inspection of NAC component fabrication activities conducted at Petersen, Inc. The NRC identified a Non-Cited Violation, Severity Level IV, regarding NAC's vendor nonconformance report (VNCR) and 72.48 process in NRC Inspection Report (Enclosure 4). Specifically, Design Change Request (DCR)(L) 71160 FSAR-0Q and its associated 10 CFR 72.48 screening No. NAC-09-MAG-052 removed explicit mention of the American Concrete Institute ACI-318 requirements for slump, air entrainment, temperature, and compressive strength from FSAR Revision 0, Table 1.3-4 for the Concrete Cask lid by creating a new table specific to the Concrete Cask lid. The Concrete Cask body requirements remained unchanged. The specific violation was that NAC failed to file a CoC amendment with the NRC

fully describing the changes being made prior to implementing them via DCR(L) 71160-FSAR-0Q. The NRC CoC, Docket 72-1031, Appendix A, “Technical Specifications and Design Features for the MAGNASTOR System,” Section 4.2, “Codes and Standards,” commits to “The American Concrete Institute Specifications ACI-349 and ACI-318 govern the CONCRETE CASK design and construction, respectively.” Contrary to this requirement, the VCCs listed in Enclosure 1 do not fully conform to the Code requirements.

Enclosure 2 provides the exemption request including a description of the need and justification for the issuance of an exemption. The exemption request provides the basis and technical justification for the continued use of VCCs already loaded and in storage operations or on-site and available for loading. Enclosures 3, 5, and 7 contain proprietary information to be withheld from public disclosure in accordance with 10 CFR 2.390, as documented by the signed affidavit in Enclosure 8. Enclosure 4 provides the NRC Inspection Report that took place in December 2021 at Petersen Inc., the fabricator of components of the NAC MAGNASTOR system. Enclosure 6 contains the recently submitted License Amendment Request for the NAC International MAGNASTOR Cask System Amendment No. 12 (ADAMS Accession No. ML22024A374). A supplement to Reference 6 was subsequently submitted to the NRC by NAC, and is provided in Enclosure 7. In summary, this exemption request concludes, along with supporting technical documentation from NAC, that there is reasonable assurance that the affected systems and components still maintain their ability to perform their safety function.

Duke Energy is requesting NRC approval of this exemption request, as the aforementioned issue affects previously fabricated systems that are either currently loaded and in storage operations or on-site and otherwise available for loading. Duke Energy requests the approval of this exemption request no later than May 13, 2022, to support a planned cask loading campaign at Catawba Nuclear Station. The planned campaign is scheduled to begin on June 5, 2022. If the campaign does not continue as scheduled, Catawba Unit 2 will lose full core offload capability following the Fall 2022 outage. The McGuire Nuclear Station loading campaign is scheduled to begin on July 31, 2022, immediately following the campaign window at Catawba, and is directly tied to that evolution finishing in a timely fashion. The dry storage fleet scheduling approach and utilization of fleet resources that also support fleet outages would make it difficult to reschedule the Catawba campaign prior to the Fall outage if the currently planned loading window is missed.

No regulatory commitments are contained in this letter. Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager (acting) – Nuclear Fleet Licensing, at (980) 373-1530.

Sincerely,

Shawn K. Gibby

Shawn Gibby
Vice President
Nuclear Engineering

NDE

Enclosures:

1. List of Affected Vertical Concrete Casks (VCCs)
2. Exemption Request Need and Justification
3. ED20220028 NAC Finding Report (FR No. 22-001) Impact to Safety **[Proprietary Information – Withhold from Public Disclosure in Accordance with 10 CFR 2.390]**
4. U.S. Nuclear Regulatory Commission Inspection Report No. 72-1015/2021-201, January 21, 2022
5. NAC International Finding Report 22-001**[Proprietary Information – Withhold from Public Disclosure in Accordance with 10 CFR 2.390]**
6. Submission of an Amendment Request for the NAC International MAGNASTOR Cask System Amendment No.12 (ADAMS Accession No. ML22024A374), January 24, 2022
7. Supplement to Amendment Request for the NAC International MAGNASTOR Cask System Amendment No. 12 **[Proprietary Information – Withhold from Public Disclosure in Accordance with 10 CFR 2.390]**
8. NAC International Affidavit for Enclosures 3, 5 and 7

CC (w/ Enclosures):

L. Dudes, U.S. NRC, Regional Administrator
J. Austin, U.S., NRC, Sr. Resident Inspector – Catawba
A. Hutto, U.S. NRC, Sr. Resident Inspector – McGuire
Z. Stone, U.S. NRC, Project Manager – Catawba
J. Klos, U.S. NRC, Project Manager – McGuire
B. White, U.S. NRC, Sr. Project Manager, Division of Spent Fuel Management

Enclosure 1

List of Affected Vertical Concrete Casks (VCCs)

Duke Energy			
Site	**Serial Number**	**Model**	**Loading Status**
CNS	CN-VCC-073	MAGNASTOR	Loaded
CNS	CN-VCC-074	MAGNASTOR	Loaded
CNS	CN-VCC-075	MAGNASTOR	Loaded
CNS	CN-VCC-076	MAGNASTOR	Loaded
CNS	CN-VCC-077	MAGNASTOR	Loaded
CNS	CN-VCC-078	MAGNASTOR	Loaded
CNS	CN-VCC-079	MAGNASTOR	Loaded
CNS	CN-VCC-080	MAGNASTOR	Loaded
CNS	CN-VCC-081	MAGNASTOR	Loaded
CNS	CN-VCC-082	MAGNASTOR	Loaded
CNS	CN-VCC-083	MAGNASTOR	Loaded
CNS	CN-VCC-084	MAGNASTOR	Loaded
CNS	CN-VCC-085	MAGNASTOR	Loaded
CNS	CN-VCC-086	MAGNASTOR	Loaded
CNS	CN-VCC-087	MAGNASTOR	Loaded
CNS	CN-VCC-088	MAGNASTOR	Loaded
CNS	CN-VCC-089	MAGNASTOR	Loaded
CNS	CN-VCC-090	MAGNASTOR	Loaded
CNS	CN-VCC-091	MAGNASTOR	Loaded
CNS	CN-VCC-092	MAGNASTOR	Loaded
CNS	CN-VCC-093	MAGNASTOR	Loaded
CNS	CN-VCC-094	MAGNASTOR	Loaded
CNS	CN-VCC-095	MAGNASTOR	Loaded
CNS	CN-VCC-096	MAGNASTOR	Loaded
CNS	CN-VCC-118	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-119	MAGNASTOR	Loaded
CNS	CN-VCC-120	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-121	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-122	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-123	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-124	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-125	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-126	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-127	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-128	MAGNASTOR	Not Yet Loaded
CNS	CN-VCC-129	MAGNASTOR	Not Yet Loaded

Duke Energy			
Site	**Serial Number**	**Model**	**Loading Status**
MNS	MN-VCC-053	MAGNASTOR	Loaded
MNS	MN-VCC-054	MAGNASTOR	Loaded
MNS	MN-VCC-055	MAGNASTOR	Loaded
MNS	MN-VCC-056	MAGNASTOR	Loaded
MNS	MN-VCC-057	MAGNASTOR	Loaded
MNS	MN-VCC-058	MAGNASTOR	Loaded
MNS	MN-VCC-059	MAGNASTOR	Loaded
MNS	MN-VCC-060	MAGNASTOR	Loaded
MNS	MN-VCC-061	MAGNASTOR	Loaded
MNS	MN-VCC-062	MAGNASTOR	Loaded
MNS	MN-VCC-063	MAGNASTOR	Loaded
MNS	MN-VCC-064	MAGNASTOR	Loaded
MNS	MN-VCC-065	MAGNASTOR	Loaded
MNS	MN-VCC-066	MAGNASTOR	Loaded
MNS	MN-VCC-067	MAGNASTOR	Loaded
MNS	MN-VCC-068	MAGNASTOR	Loaded
MNS	MN-VCC-069	MAGNASTOR	Loaded
MNS	MN-VCC-070	MAGNASTOR	Loaded
MNS	MN-DF VCC-071	MAGNASTOR DF	Loaded
MNS	MN-DF VCC-072	MAGNASTOR DF	Loaded
MNS	MN-VCC-100	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-101	MAGNASTOR	Loaded
MNS	MN-VCC-102	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-103	MAGNASTOR	Loaded
MNS	MN-VCC-104	MAGNASTOR	Loaded
MNS	MN-VCC-105	MAGNASTOR	Loaded
MNS	MN-VCC-106	MAGNASTOR	Loaded
MNS	MN-VCC-107	MAGNASTOR	Loaded
MNS	MN-VCC-108	MAGNASTOR	Loaded
MNS	MN-VCC-109	MAGNASTOR	Loaded
MNS	MN-VCC-110	MAGNASTOR	Loaded
MNS	MN-VCC-111	MAGNASTOR	Loaded
MNS	MN-VCC-112	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-113	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-114	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-115	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-116	MAGNASTOR	Not Yet Loaded
MNS	MN-VCC-117	MAGNASTOR	Not Yet Loaded

Enclosure 2

Exemption Request Need and Justification

Table of Contents

Exemption Request for Nonconforming Vertical Concrete Casks (VCCs)

Executive Summary

NAC International, the Certificate of Compliance (CoC) holder for the MAGNASTOR storage system, recently brought to the attention of Duke Energy that they had identified a compliance issue with the fabrication of vertical concrete casks (VCCs) delivered to Duke Energy.

The issue was identified during an NRC inspection of NAC component fabrication activities conducted at Petersen, Inc. in Ogden, UT. The inspection team identified a Non-Cited Violation (NCV), Severity Level IV violation regarding NAC's VNCR and 72.48 process in NRC Inspection Report issued on January 21, 2022 (Enclosure 4). Specifically, DCR(L) 71160 FSAR-0Q and its associated 72.48 No. NAC-09-MAG-052 removed explicit mention of the ACI-318 requirements for slump, air entrainment, temperature, and compressive strength from FSAR Revision 0, Table 1.3-4 for the Concrete Cask lid by creating a new table specific to the Concrete Cask lid. The Concrete Cask body requirements remained unchanged. The specific violation was that NAC failed to file a Certificate of Compliance (CoC) amendment with the NRC fully describing the changes being made prior to implementing them via DCR(L) 71160-FSAR-0Q. The NRC CoC, Docket 72-1031, Appendix A, "Technical Specifications and Design Features for the MAGNASTOR System," Section 4.2, "Codes and Standards," commits to "The American Concrete Institute Specifications ACI-349 and ACI-318 govern the CONCRETE CASK design and construction, respectively." without alternatives and with no clear delineation between the Concrete Cask and the Concrete Cask lid. It is noted that the NRC inspection "team characterized the violation as a Severity Level IV violation because the change resulted in a condition having low safety significance." NAC entered this into their Corrective Action Program (CAP) as Finding Report (FR) 22-001 (Enclosure 5). In addition, NAC submitted Amendment 12 for NAC MAGNASTOR CoC 1031 on January 24, 2022 (Enclosure 6) to correct this issue. NAC provided the NRC with a supplement to the Amendment 12 submittal on March 18, 2022 (Enclosure 7).

NAC has performed a detailed review of this issue and has completed their technical evaluations. NAC has determined there is reasonable assurance that this issue does not present a safety issue since the VCC lids will perform their intended safety functions. However, the MAGNASTOR CoC requires Duke Energy to implement the MAGNASTOR system in accordance with the CoC. Thus, Duke Energy is requesting NRC approval of an exemption request to 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214 because this affects previously fabricated systems that are either currently loaded and in storage operations or on-site and otherwise available for loading.

1.0 Background

Duke Energy currently has 74 MAGNASTOR systems either in storage operations or available for loading that are not in compliance with the American Concrete Institute (ACI) requirements for the VCC lids. Enclosure 1 lists all the affected VCCs. The VCC body is in compliance with ACI requirements and is outside scope of this request.

MAGNASTOR CoC, Appendix A, Section 4.2, states that the American Concrete Institute Specifications ACI-349 and ACI-318 govern the CONCRETE CASK design and construction, respectively.

Duke Energy is requesting NRC approval of an exemption request to 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214 because this affects previously fabricated systems that are either currently loaded and in storage operations or on-site and otherwise available for loading.

2.0 Requested Exemption

In accordance with 10 CFR 72.7, "Specific Exemptions", Duke Energy requests NRC approval of an exemption for the Duke Energy Independent Spent Fuel Storage Installation (ISFSI) from the following requirements of 10 CFR 72.212, due to a non-compliance issue with Appendix A, Section 4.2 of CoC No. 1031, Amendment 7:

- 10 CFR 72.212(a)(2), which states “this general license is limited to storage of spent fuel in casks approved under the provisions of this part.”
- 10 CFR 72.212(b)(3), which states the general licensee must "ensure that each cask used by the general licensee conforms to the terms, conditions, and specifications of a CoC or an amended CoC listed in § 72.214"
- 10 CFR 72.212(b)(5)(i), which states the general licensee must "perform written evaluations, before use and before applying the changes authorized by an amended CoC to a cask loaded under the initial CoC or an earlier amendment CoC, which establich that: The cask, once loaded with spent fuel or once the changes authorized by an amended CoC have been applied, will conform to the terms, conditions, and specifications of a CoC or an amended CoC listed in § 72.214"
- The relevant portion of 10 CFR 72.212(b)(11) which states that "the licensee shall comply with the terms, conditions, and specifications of the CoC ... "
- 10 CFR 72.214, which includes Certificate Number: 1031, Amendment Number 7 Effective Date: August 21, 2017, as corrected (ADAMS Accession No. ML19045A346).

The list of affected VCCs and their serial numbers are listed in Enclosure 1. These systems are currently either loaded and in storage operations on the ISFSI pad or on-site and otherwise available for loading. This exemption request would allow the continued use of the systems currently in non-compliance for the term specified in the CoC. This exemption request concludes, along with supporting technical documentation from NAC, that the affected systems and components still maintain their ability to perform their safety functions.

3.0 Technical Assessment

Duke Energy is requesting NRC approval of an exemption request to 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214 because this affects previously fabricated systems that are either currently loaded and in storage operations or on-site and otherwise available for loading. The proposed exemption is limited in scope to only those affected VCCs listed in Enclosure 1 and relates to ACI Specification compliance with regards to concrete used in the MAGNASTOR VCC lids. Specifically, testing for slump, air entrainment, temperature, and compressive strength was not performed as required by the ACI Specification.

NAC's CAP generated FR 22-001 to assess the issue. This assessment was documented by NAC International in ED20220028, Submission of Amendment Request for NAC International MAGNASTOR Cask System Amendment No. 12 (ML22024A374), and Supplement to Amendment Request for the NAC International MAGNASTOR Cask System Amendment No. 12. These documents conclude that the licensing basis design function of the concrete in the VCC lid to reduce skyshine radiation continues to be met. This is demonstrated by the verification of concrete density in the VCC lid during fabrication in accordance with FSAR requirements. In addition, the Technical Specifications require dose measurements are taken prior to moving a loaded system to the storage pad to ensure the VCC lid performs adequately with respect to its licensing basis radiation shielding function. These documents are provided in Enclosures 3, 6, and 7, respectively.

4.0 Basis for Approval

The proposed exemption request is limited in scope in that it only relates to non-compliance with certain concrete testing requirements specified in the ACI Specifications, as invoked by the MAGNASTOR CoC. The proposed exemption request involves no physical change to the VCC lid design, and no change to the VCC lid materials.

The Technical Assessment (Section 3.0) provides the basis for the conclusion that there is reasonable assurance that safety margin exists for the affected VCCs, listed in Enclosure 1, for their initial 20-year service lifetime, even though 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214 are not explicitly met. Thus, the requested exemption is authorized by law since it does not endanger life, property, or common defense and security and is otherwise in the public interest as described below.

4.1 Authorized by Law

Duke Energy is requesting an exemption from the requirements of 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11) and 10 CFR 72.214. 10 CFR 72.7 gives the NRC the authority to grant exemptions from the requirements of 10 CFR Part 72 provided they do not endanger life or property or the common defense and security and are otherwise in the public interest. This exemption request documents that these criteria are met. The exemption is authorized by law.

4.2 Does Not Endanger Life, Property or Common Defense and Security

As discussed in Section 3.0, the affected VCCs listed in Enclosure 1 can still perform their intended safety function. Even though the concrete in the VCC lids was not tested in accordance with ACI Specifications, sufficient evidence exists to reasonably conclude that they still effectively reduce skyshine radiation.

4.3 Otherwise In The Public Interest – Alternatives

Duke Energy has evaluated replacement alternatives to the proposed exemption request. However, none of the alternatives provide the safety assurances and reduced radiological risk provided by the exemption request for VCCs that have been loaded. To bring the affected loaded VCCs into compliance with CoC 1031, Amendment 7, would involve removing the non-compliant VCC lid from the VCC body, replacing with a VCC lid that is in compliance, and returning the system into storage operations. The necessary equipment, personnel, facilities, time, and radiological exposure required to perform these actions is not in the interest of the public. VCC lids that are not yet loaded could be replaced but this would be at a significant monetary cost and operational impact to Duke Energy without providing any improvement to the VCC lids ability to perform its safety functions. Due to the timeline of fabrication, the operational impacts of replacing non-loaded VCC lids on site include but are not limited to a reduction in the number of open cells in the spent fuel pools below prudent operating reserve, rescheduling of currently planned loading campaigns, support of additional procurement, and disposal of current VCC lids. Approval of this exemption request will not impact functionality of the VCCs on-site, as the exemption applies to examination requirements and does not seek to alter the VCC design.

4.4 Conclusion

Based on the above discussion, the exemption request is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest as the exemption provides the least risk, least dose, least radioactive waste and least cost. Any campaign to discard and replace the affected VCC lids would create operational challenges and risks associated with additional operational requirements, occupational doses, and generation of significant quantities of radioactive wastes.

5.0 Environmental Consideration

5.1 Background

MAGNASTOR storage casks are designed to mitigate the effects of design basis accidents that could occur during storage. Design basis accidents account for human- induced events and the most severe natural phenomena reported for the site and surrounding area. Postulated accidents analyzed for an ISFSI include tornado winds and tornado-generated missiles, a design basis earthquake, a design basis flood, an accidental cask drop, lightning effects, fire, explosions, and other incidents.

Considering the specific design requirements for each accident condition, the design of the cask would prevent loss of confinement, shielding, and criticality control. Without the loss of confinement, shielding, or criticality control functions, the risk to public health and safety is not

compromised. The NRC staff performed a detailed safety evaluation of the CoC amendment under which the subject 74 canisters were loaded or are planned for loading (i.e., Amendment 7) and found that an acceptable safety margin is maintained, that the proposed changes provided reasonable assurance that the spent fuel can be stored safely, meet the acceptance criteria specified in 10 CFR Part 72, and that there continues to be reasonable assurance that public health and safety will be adequately protected.

5.2 No Significant Hazards Consideration

In order to support the assertion in the following Section 5.3 that this exemption request meets the definition of a regulatory action eligible for a categorical exclusion or otherwise does not require an environmental review, Duke Energy is providing the following No Significant Hazards Consideration (NSHC). The NSHC is being performed in accordance with 10 CFR 50.92, insofar as 10 CFR 72 does not establish separate criteria. Duke Energy has evaluated the proposed exemption request in accordance with the standards in 10 CFR 50.92 and has determined that the requested exemption presents no significant hazards. Duke Energy evaluation against each of the criteria in 10 CFR 50.92 follows.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The probability (frequency of occurrence) of any Updated Final Safety Analysis Report (UFSAR) evaluated accident occurring is not affected by the requested exemption, because Duke Energy continues to comply with the design basis criteria established for VCCs.

There is no change in consequences of postulated accidents because enclosed supporting technical justifications demonstrates that the affected VCCs will continue to perform their intended safety function. Thus, the results of accident evaluations remain within the NRC approved acceptance limits.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The exemption request does not create the possibility of a new operating mode, or accident scenario, nor does the exemption request rely on new equipment, or postulate a new equipment failure mode. In order for an activity to create the possibility for an accident of a different type, the activity would have to introduce a new material, a new man-machine interface, a new operational process, or other significant change that would initiate a new type of failure or cause a previously-described accident to propagate differently. As previously described, the proposed activity is purely an ACI Specification concrete testing compliance issue in nature and involves no physical change to the VCC lid design, and no changes to the VCC lid materials or the loading operations. Therefore, the proposed activity does not create a possibility for an accident of a different type

and does not result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the UFSAR.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

As discussed in Section 3.0, herein, sufficient evidence exists to reasonably conclude that the VCC lids continue to meet their intended safety function. Even though the concrete in the VCC lids was not tested in accordance with ACI Specifications, sufficient evidence exists to demonstrate that they still effectively reduce skyshine radiation. Therefore, the proposed exemption request does not involve a significant reduction in a margin of safety.

Based on the considerations above, Duke Energy has determined that storage of spent fuel in the affected VCCs listed in Enclosure 1, in accordance with the exemption request, does not involve a significant hazards consideration as defined in 10 CFR 50.92(c), in that it does not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

5.3 Environmental Impact of the Proposed Action

Based on the technical review provided in Section 3.0, herein, the affected VCCs will continue to perform their intended safety functions. Thus, there is no environmental impact of the proposed action. The proposed action would restore the affected VCCs listed in Enclosure 1 to a conforming [operable] status, allowing them to remain in storage operations or be placed into service for the term specified in the CoC.

The exemption request provides the bases for acceptability of the affected VCCs. The exemption request meets the categorical exclusion of 10 CFR 51.22(c)(25) as a regulatory action eligible for a categorical exclusion or otherwise does not require an environmental review, because there is: (Note: Duke Energy responses are provided in brackets after each requirement)

(i) no significant hazards consideration; [See Section 5.2.]

(ii) no significant change in the types or significant increase in the amounts of any effluents that may be released offsite;

[No significant changes of effluents or types of effluents are requested to be released under this exemption request.]

(iii) no significant increase in individual or cumulative public or occupational radiation exposure;

[No significant increases in radiation to individuals or the public are requested under this exemption request.]

(iv) no significant construction impact;

[No construction is being requested or impacted under this exemption request.]

(v) no significant increase in the potential for or consequences from radiological accidents; and

[No significant increase in the potential for or consequences of a radiological accident is being requested in this exemption request.]

(vi) the requirements from which an exemption is sought involve:...

(C) inspection or surveillance requirements;...

[The request seeks an exemption from CoC, Appendix A, Section 4.2, which invokes ACI Specifications regarding concrete testing requirements for the Concrete Cask lid.]

Further, the proposed exemption does not require any changes to the Duke Energy ISFSI Environmental Report and applicable Safety Analysis Report analyses remain bounding.

5.4 Environmental Impact of Alternatives to the Proposed Action

As discussed in Section 4.3, Duke Energy has considered alternatives to the proposed exemption, which is to remove the affected [loaded] VCC lids, discard, and replace them. The environmental impacts of this alternative would result in both real and potential environmental impacts. The real impact for replacing all affected VCC lids, both loaded and those not yet loaded, is not negligible when considering raw material production, VCC lid fabrication, and VCC lid transportation to site. Duke Energy has also estimated that the implementation of these alternatives would result in a not insignificant increase in occupational dose and low-level radioactive waste (LLRW) that would have to be processed and disposed.

Occupational doses for removing affected VCC lids and subsequent replacement with new VCC lids would not be insignificant. Other radioactive wastes would be generated from radioactively contaminated consumables and anti-contamination clothing used during the VCC lid replacement process. This radioactive waste would be transported and ultimately disposed of at a qualified LLRW disposal facility, potentially exposing it to the environment.

In addition, this evolution results in additional risks of both off-normal events and design basis accidents, which could involve a radiological release to the environment.

5.5 Conclusion

As a result of the environmental assessment, Duke Energy concludes that the proposed action, which will allow Duke Energy to maintain affected VCCs in their current state with non-compliant ACI specified concrete testing for the VCC lids, is in the public interest in that it avoids the adverse environmental effects associated with the alternatives to the proposed action.

6.0 References

1. US NRC Inspection Report No. 72-1015/2021-201, January 21, 2022 (Enclosure 4).

2. NAC International Finding Report (FR No. 22-001) and response – Report (Enclosure 5).

3. ML22024A374 – NAC-MAGNASTOR Amd. 12 (ACI-349 and 318 Cask Lid – January 24, 2022 (Enclosure 6).

4. MAGNASTOR Final Safety Analysis Report, Revision 10 (ADAMS Accession No. ML19035A196).

5. ML22077A769, ML22077A770, ML22077A771 – Supplement to NAC-MAGNASTOR Amd. 12 – March 18, 2022 (Enclosure 7).

~~**Proprietary Information – Withhold from Public Disclosure in Accordance with 10 CFR 2.390**~~

Enclosure 3

ED20220028

NAC Finding Report (FR No. 22-001) Impact to Safety

Enclosure 4

U.S. Nuclear Regulatory Commission Inspection Report
No. 72-1015/2021-201
January 21, 2021

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 21, 2022

B. Greene, Vice President of Quality
NAC International
3930 East Jones Bridge, Suite 200
Norcross, GA. 30092

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 72-1015/2021-201

Dear Mr. Greene:

On December 7, 2021, through December 9, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an announced onsite inspection at Petersen Incorporated (Petersen) in Ogden, Utah. Petersen is under contract with NAC International (NAC) to fabricate important to safety (ITS) components of the NAC MAGNASTOR system.

The purpose of the inspection was to verify and assess the adequacy of NAC's compliance with the NRC requirements for the design, modification, fabrication, assembly, testing, and procurement of MAGNASTOR components. NAC is the holder of the certificate of compliance (CoC) and designer of the NAC MAGNASTOR system.

The inspection scope included observations of in field fabrication activities, reviews of records, and interviews with personnel to determine whether a dry cask storage system (DCSS), fabricated by an offsite entity and for use in an independent spent fuel storage installation (ISFSI), is constructed in accordance with the commitments and requirements specified in the safety analysis report (SAR), the NRC's corresponding safety evaluation report (SER), 10 CFR Part 72 and the CoC and technical specifications (TS); and to determine whether the outside fabricator's activities are conducted in accordance with NRC-approved Quality Assurance Program (QAP) requirements. The enclosed report presents the results of this inspection, which were discussed with you and other members of your staff on December 9, 2021.

Based on the results of this inspection, the NRC inspection team determined that three Severity Level IV violations of NRC requirements occurred. The NRC is treating these violations as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. The NRC inspection team described these NCVs in the subject inspection report.

If you contest these violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Director, Office of Nuclear Materials Safety and Safeguards; and (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Hipolito J. Gonzalez Digitally signed by Hipolito J. Gonzalez Date: 2022.01.21 12:49:06 -05'00'

Hipolito Gonzalez, Acting Chief
Inspections and Operations Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-1015

Enclosure:
NRC Inspection Report No.
72-1015/2021201

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 72-1015/2021-201

DOCUMENT DATE: January 21, 2022

DISTRIBUTION:
DFM r/f

ADAMS Accession No.: ML22021B305
C = COVER E = COVER & ENCLOSURE N = NO COPY ***via email**

OFFICE	DFM	DFM	DFM		
NAME	MLearn	WWheatley	HGonzalez		
DATE	01/18/22	01/19/22	01/20/22		

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
Office of Nuclear Material Safety and Safeguards
Division of Fuel Management

Docket:	72-1015
Report.:	72-1015/2021-201
Enterprise Identifier:	I-2021-201-0066
Certificate Holder:	NAC International Inc.
Facility:	Petersen Incorporated
Location:	Ogden, Utah
Inspection Dates:	December 7, 2021, through December 9, 2021
Inspection Team:	Matthew Learn, Transportation and Storage Safety Inspector, Team Leader Jeremy Tapp, Transportation and Storage Safety Inspector Marlone Davis, Senior Transportation and Storage Safety Inspector
Approved By:	Hipolito Gonzalez, Acting Branch Chief Inspections and Operations Branch Division of Fuel Management Office of Nuclear Material Safety and Safeguards

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION
Office of Nuclear Material Safety and Safeguards
Division of Fuel Management

EXECUTIVE SUMMARY

NAC International
NRC Inspection Report 72-1015/2021-201

On December 7, 2021, through December 9, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an announced onsite inspection at Petersen Incorporated (Petersen) in Ogden, Utah. Petersen is under contract with NAC to fabricate important to safety (ITS) components of the NAC MAGNASTOR system.

The purpose of the inspection was to verify and assess the adequacy of NAC International (NAC)'s compliance with the NRC requirements for the design, modification, fabrication, assembly, testing, and procurement of MAGNASTOR components. NAC is the holder of the certificate of compliance (CoC) and designer of the NAC MAGNASTOR system.

Design Control

- The team determined, for the items selected for review, that the fabrication specifications were consistent with the design commitments and requirements documented in the safety analysis report (SAR), the CoC, and technical specifications (TS). (Section 1.1)

Corrective Action and Non-Conformance Reports

- The team determined that generally corrective actions for identified fabrication deficiencies were implemented in a time frame commensurate with their significance, and nonconformance reports documenting the deficiencies were initiated and resolved.

- One Severity Level IV Non-Cited Violation (NCV) of 10 CFR 72.48, “Changes, Tests, and Experiments” was identified for NAC’s failure to obtain a CoC amendment for changes to ACI-318 requirements for the MAGNASTOR cask system that required a change to the specifications incorporated in the MAGNASTOR System CoC No. 1031 Amendments 0-6.

- One Severity Level IV NCV of 10 CFR 72.150, “Instructions, procedures, and drawings” was identified for Petersen’s failure to ensure a final dimensional verification occurs after adjusting the MAGNASTOR fuel basket within fabrication procedures. (Section 1.2)

Personnel Training and Certifications

- The team determined that individuals performing quality-related activities were trained and certified as required. (Section 1.3)

Human Performance

- The team determined that the offsite fabricator's personnel were familiar with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the DCSS. (Section 1.4)

Procurement

- The team determine that materials, components, and other equipment received by the fabricator meet DCSS design procurement specifications, and the procurement specifications conform to the design commitments and requirements contained in the Final Safety Analysis Report (FSAR), CoC and TS. (Section 1.5)

Implementing Procedures

- The team determined that DCSS components were generally being fabricated and inspected per approved quality assurance (QA) and 10 CFR Part 21 implementing procedures and fabrication specifications.

- One Severity Level IV NCV of 10 CFR 72.158, “Control of special processes” was identified for Petersen’s failure to perform an adequate Magnetic particle testing (MT) inspection of a fuel tube seam weld. (Section 1.6)

10 CFR Part 21

- The team determined that: fabrication activities were conducted under an NRC-approved QAP; the provisions of 10 CFR Part 21 were implemented; the fabricator's personnel were familiar with the reporting requirements of 10 CFR Part 21; and the fabricator complied with 10 CFR 21.6, "Posting requirements". (Section 1.7)

Oversight and Audits

- The team determined, for the items selected for review, that the CoC holder is performing oversight and audits in accordance with their QA program. (Section 1.8)

REPORT DETAILS

1.0 ISFSI Component Fabrication by Outside Fabricators (Inspection Procedure (IP) 60852)

1.1 Design Control

1.1.1 Inspection Scope

The team determined whether the fabrication specifications were consistent with the design commitments and requirements documented in the SAR, the CoC, and technical specifications.

The team reviewed licensing drawings against the design and fabrication drawings to verify the consistency of critical dimensions and material specification as well as testing and inspection requirements to determine whether they were consistent with the design. Specifically, the team focused on the translation of design commitments and requirements for the important to safety (ITS) Category A, B, and C subcomponents of the Transportable Storage Canisters (TSC)s from the NAC FSAR Revision 12, including associated licensing drawings, to design and fabrication drawings, and subsequently manufacturing plans.

The team reviewed the following Petersen standard operating procedures (SOP) procedures associated with design control during fabrication to verify proper implementation:

PI-SOP-06-01; Document Control Procedure; Revision 14
PI-SOP-17-01; Quality Assurance Records; Revision 9

Additionally, the NAC design and fabrication drawings reviewed by the team are as follows:

30032-266, "Closure Lid Assembly, PWR DF TSC, MAGNASTOR," APS; Revision 1
30032-268, "Fuel Tube Assembly, PWR DF Basket, MAGNASTOR," APS; Revision 1
30032-269, "Corner Weldment, PWR DF Basket, MAGNASTOR," APS; Revision 1
30032-270, "PWR OF Basket Assembly, 37 Cells, MAGNASTOR," APS; Revision 1
30032-273, "Corner Weld, PWR DF Basket, MAGNASTOR," APS; Revision 1
30032-277, "Shell Weldment, PWR TSC, MAGNASTOR," APS; Revision 1
30032-278, "Closure Lid Assembly, PWR TSC, MAGNASTOR, APS; Revision 0
30032-280, "PWR TSC Assembly, 37 Cells, MAGNASTOR," APS; Revision 1
30032-312, "TSC, Weld Mock-up, MAGNASTOR," APS; Revision 0

The team evaluated the design controls that were in place for the transmittal and handling of the above mention design and fabrication drawing received from NAC and how Petersen modified, as applicable, the approval of the fabrication drawings. The team also evaluated the process for distributing controlled drawings, their locations, and retrieval to verify that old or uncontrolled versions were not being used.

1.1.2 Observation and Findings

The team did not identify any unexplained discrepancies between the design and fabrication specifications and the NAC FSAR licensing drawings. The team noted that Petersen captured all requirements that were applicable to fabrication. The team also observed that Petersen was not providing any design engineering services. However, Petersen provided more conservative tolerances on fabrication drawings than those listed in the design drawings. The team noted that NAC incorporated the design change requests (DCR)s associated with design drawings into fabrication drawings. Drawings were legible and contained the relevant information needed for fabrication.

The team observed that Petersen followed their procedure for document control and the storage of quality assurance records. Staff were able to readily retrieve a sample of requested drawings revisions and demonstrate the process of issuing and withdrawing controlled copies of drawings to the field for fabrication. Quality assurance records were kept on a secure digital server onsite, which automatically backed up information to a secure digital server offsite. Petersen also maintained paper copies of records in a storage area onsite.

Overall, the team did not identify any issues of concerns in the translation of design information. The team did note that in most cases fabrication drawings, shop travelers, and procedures were adequately identified at various work locations with each component as necessary. The team also noted that the documents reflected the correct revisions, as applicable.

No findings of significance were identified.

1.1.3 Conclusions

The team determined, for the items selected for review, that the fabrication specifications were consistent with the design commitments and requirements documented in the SAR, the CoC, and TS.

1.2 Corrective Action and Non-Conformance Reports

1.2.1 Inspection Scope

The team determined whether corrective actions for identified fabrication deficiencies have been implemented in a time frame commensurate with their significance, and whether nonconformance reports documenting the deficiencies have been initiated and resolved.

The team reviewed a sample of records and interviewed personnel to determine whether Petersen effectively implemented corrective actions identified for fabrication deficiencies in a time frame commensurate with their significance and in accordance with their QA program procedure. Specifically, the team reviewed Petersen's PI-SOP-16-01, "Corrective and Preventive Action Procedure," Revision 14. The team selected and reviewed several preventative/corrective action reports (P/CARs) from December 2018 to November 2021. The team also included a review of P/CAR number 621 to follow-up on the corrective actions to a violation from the previous inspection.

In addition, the team reviewed selected records and interviewed personnel to verify that Petersen effectively implemented a nonconformance control program in accordance with the requirements of 10 CFR Part 72 and approved QA procedures. Specifically, the team reviewed Petersen's approved procedure PI-SOP-15-01, "Nonconforming Material Procedure," Revision 21. The team selected several nonconformance reports (NCRs) to verify that the NCRs were identifiable, traceable, and the disposition of the nonconformance was adequate. The team reviewed NCRs since the 2018 inspection and concentrated on issues involving ITS structures, systems, and components (SSCs). The team reviewed these NCRs to evaluate if the disposition was appropriate, adequately performed as necessary, and properly closed out in accordance with the approved procedure PI-SOP-15-01. The NCRs related to 10 CFR 72.48 screenings and/or evaluations, NAC provided a vendor nonconformance report number (VNCR#). The team focused the review on the NCR/VNCRs with accept-as-is and repair dispositions because generally these required a technical justification or engineering evaluation against the requirements in 10 CFR 72.48.

1.2.2 Observation and Findings

The team reviewed VNCR numbers (Nos.) 845971-04 and 845971-13 with their corresponding 10 CFR 72.48 screening Nos. NAC-20-MAG-004 and NAC-20-MAG-019, respectively. The team also reviewed, design change requests (DCRs) No. 71160-FSAR-0Q and 71160-FSAR-0AX with the corresponding 10 CFR 72.48 screening Nos. NAC-09-MAG-052 and NAC-10-MAG-082, the MAGNASTOR System FSAR Revisions 0,1, and 10, the MAGNASTOR System CoC No. 1031 and associated technical specifications (TSs), and the NRC Safety Evaluation Report (SER) for Amendments 0-6 of the MAGNASTOR System.

During the review of VNCR Nos 845971-04 and 845971-13, the team noted that NAC initiated the VNCRs because the concrete mix for the concrete cask lid did not meet the NAC design drawing (No. 30076-064). The NAC design drawing provided the specified code requirements of the mix and materials used in fabrication activities at Petersen for the concrete cask lid. The team noted that the CoC TS Section 4.2 and MAGNASTOR FSAR Sections 1.3.1.3, 8.2, and 10.1.1 contained the requirements and information for the concrete specifications, procurement, and construction.

Specifically, TS Section 4.2, "Codes and Standards" requires, in part, that the American Concrete Institute (ACI) Specifications ACI-349 and ACI-318 govern the CONCRETE CASK design and construction, respectively.

FSAR Section 1.3.1.3, "Concrete Cask" states, in part, that a carbon steel and concrete lid is bolted to the top of the concrete cask. (See Table 1.3-4 for the Concrete Cask Lid - Concrete Specification Summary.) The lid reduces skyshine radiation and provides a cover to protect the TSC from the environment and postulated tornado missiles. Fabrication of the concrete cask requires no unique or unusual forming, concrete placement, or reinforcement operations. The concrete portion of the cask is constructed by placing concrete between a reusable, exterior form, and the steel liner. Reinforcing bars are used near the inner and outer concrete surfaces to provide structural integrity. The structural steel liner and base are shop fabricated. Refer to Table 1.3-3 for the fabrication specifications for the concrete cask.

The team observed that NAC revised this section of the FSAR including Tables 1.3-3 and 1.3-4 as a part of DCRs Nos. 71160-FSAR-0Q and 71160-FSAR-0AX and 10 CFR 72.48 screening Nos. NAC-09-MAG-052 and NAC-10-MAG-082, to separate the concrete shell fabrication specifications from the concrete lid for the concrete cask and removed specific ACI-318 requirements from the construction/fabrication specifications for the concrete lid (e.g., no strength requirements). As stated in the DCR No. 71160-FSAR-0Q, NAC removed the specific ACI-318 requirements because NAC determined the concrete lid did not take credit for any structural performance.

FSAR Section 8.2 states, in part, the concrete portion of the cask is procured in accordance with the requirements of ACI 318, as supplemented by applicable American Standard Testing and Material (ASTM) standards.

FSAR Section 10.1.1 states, in part, that construction and inspections of the concrete component of the concrete cask shall be performed in accordance with applicable sections and requirements of ACI-318.

The team reviewed the TSs associated with the CoC No. 1031, Amendments 0 through 6 and accompanying NRC SERs. The team noted that there was no change to the TSs to reflect the design changes specified in the FSAR Tables 1.3-3 and 1.3-4 or discussion in subsequent SERs that described the construction alternatives to the ACI-318 code. The team noted that the TS defined term of CONCRETE CASK does not separate the concrete shell and lid and the original NRC SER states, in part, that the concrete used for fabrication is ASTM C150 Type II Portland Cement and specified a minimum compressive strength and density of 4000 psi and 145 pounds per cubic feet, respectively. The NRC SER further states that based on the information provided in the SAR and the staff's independent evaluation, the staff concludes that the concrete materials meet the requirements of ACI 318, and the materials comprising the concrete cask are suitable for structural support, shielding, and protection of the TSC from environmental conditions.

The team determined that NAC made changes that reduced the commitments contained in the CoC TS, applicable FSAR sections, and NRC SER. The team noted that NAC should have answered "yes" to question 5 of 10 CFR 72.48 screening Nos. NAC-09-MAG-52 since it asked does the proposed activity require a change to the cask CoC, including Appendix A of the TS. The team determined that this was a violation of NRC requirements.

10 CFR 72.48(c)(1), requires, in part, that a certificate holder may make changes in the spent fuel storage cask design as described in the FSAR (as updated), […] without obtaining […](ii) A CoC amendment submitted by the certificate holder pursuant to § 72.244 (for general licensees and certificate holders) if: […] (B) change in the terms, conditions, or specifications incorporated in the CoC is not required.

Contrary to the above, as of November 11, 2009, the certificate holder (NAC) made changes to the spent fuel storage cask design as described in the FSAR (as updated) without obtaining a CoC amendment pursuant to 10 CFR 72.244 for a change required in the terms, conditions, or specifications incorporated in the CoC. Specifically, NAC made changes to ACI-318 requirements for the MAGNASTOR cask system design as

described in FSAR Tables 1.3-3 and 1.3-4 that required a change to the specifications incorporated in the MAGNASTOR System CoC No. 1031 Amendments 0-6.

The team assessed the significance of the violation using the NRC Enforcement Policy and Enforcement Manual. The team determined that the violation impacted the ability of the NRC to perform its regulatory oversight function because the licensee did not receive prior NRC approval for changes in licensed activities. The team determined that the violation was more than minor because the change would require NRC approval. The team characterized the violation as a Severity Level IV violation because the change resulted in a condition having low safety significance. NAC plans to enter this issue into their corrective action program (CAP) for resolution as finding report No. 22-01. The team determined that because the violation was of very low safety significance, the issue was not repetitive or willful, and being entered in the NAC's CAP, the team is treating this issue as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(72-1015/2021-201-01)**

Additionally, the team identified a violation of 10 CFR 72.150, "Instructions, procedures, and drawings," because Petersen did not prescribe activities affecting quality by procedures to ensure that personnel verified the final dimensional checks after making any adjusts to the fuel tube basket during assembly. The team initially identified this issue during the 2018 NRC inspection. Subsequently, Petersen documented the issue in P/CAR 621, and took appropriate corrective actions at the time to require personnel to initiate an NCR for any adjustments made and followed with a dimensional inspection.

When the team reviewed the corrective actions associated with P/CAR 621, the team noted that Petersen had transitioned from the old traveler instructions to a new procedure and instructions. The team noted that Petersen omitted the corrective actions from the previous issue, which allows adjustment of the fuel tubes after final dimensional verification with no subsequent final check. The team determined that this made the current instructions inadequate as the transition created a similar condition adverse to quality contained in P/CAR 621. The team determined that this was a violation of NRC requirements.

10 CFR 72.150, "Instructions, procedures, and drawings," requires, in part, that the certificate holder shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall require that these instructions, procedures, and drawings be followed. The instructions, procedures, and drawings must include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above, prior to December of 2021, a fabricator for certificate holder NAC did not prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances and include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, Petersen, under contract with NAC, did not ensure a final dimensional verification occurs after adjusting the fuel basket assembly within the revised fabrication procedure PSP-APSTSC-06, "Fabrication/Assembly Instructions for MAGNASTOR Transportable Storage Canisters and Components," Revision 3 and component traveler.

The team assessed the significance of the violation using the NRC Enforcement Policy and Enforcement Manual. The team dispositioned the violation using the traditional enforcement process in Section 2.3 of the Enforcement Policy. The team determined the violation was more than minor safety significance in accordance with Inspection Manual Chapter (IMC) 0617, "Vendor and Quality Assurance Implementation Inspection Reports," Appendix E, "Minor Examples of Vendor and QA Implementation Findings," Example 6.a; because Petersen may have adjusted the fuel basket assembly without conducting a final dimensional check. The team characterized the violation as a Severity Level IV violation in accordance with the NRC's Enforcement Policy. Petersen entered the issue into its CAP for resolution as P/CAR P937. Because this violation was of low safety significance and was entered into Petersen's CAP, the issue was not repetitive or willful, this is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(72-1015/2021-201-02)**

1.2.3 Conclusions

The team determined that generally corrective actions for identified fabrication deficiencies were implemented in a time frame commensurate with their significance, and nonconformance reports documenting the deficiencies initiated and resolved by both Petersen and NAC personnel. However, the team identified the following Severity Level IV NCVs:

One Severity Level IV NCV of 10 CFR 72.48, "Changes, Tests, and Experiments" was identified for NAC's failure to obtain a CoC amendment for changes to ACI-318 requirements for the MAGNASTOR cask system design as described in FSAR Tables 1.3-3 and 1.3-4 that required a change to the specifications incorporated in the MAGNASTOR System CoC No. 1031 Amendments 0-6.

One Severity Level IV NCV of 10 CFR 72.150, "Instructions, procedures, and drawings" was identified for Petersen's failure to ensure a final dimensional verification occurs after adjusting the MAGNASTOR fuel basket within fabrication procedures.

1.3 Personnel Training and Certifications

1.3.1 Inspection Scope

The team determined whether individuals performing quality-related activities were trained and certified where required.

The team reviewed selected records, interviewed personnel, and reviewed the following quality procedures:

PI-SOP-09-01; NDT Personnel Qualification and Certification Procedure; Revision 27
PI-SOP-02-07; Welder and Welding Operator Qualification Procedure Used to Qualify Welder, Revision 3

Specifically, the team reviewed the records of two selected quality inspectors and one welder that had performed inspection and welding for NAC related work.

1.3.2 Observation and Findings

The team noted welder performance qualifications and welder continuities conformed to Section IX of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. For the welding qualification records reviewed, the welder was qualified as required by PI-SOP-02-07 in each applicable process, and welding continuity was maintained for each of the welding processes qualified in 2021. The team also noted that Petersen qualifies nondestructive testing (NDT) personnel in accordance with the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A, which includes the required training, experience, medical testing, and education.

No findings of significance were identified.

1.3.3 Conclusions

The team determined that individuals performing quality-related activities were trained and certified as required.

1.4 Human Performance

1.4.1 Inspection Scope

The team determined whether the offsite fabricator's personnel were familiar with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the DCSS.

The team evaluated Petersen's control of the fabrication process through observations, examinations of records, and personnel interviews in the areas of fabrication and assembly, test and inspection, and familiarity with tools and equipment. The team observed the following activities:

- Welding of neutron absorber plate posts,

- Magnetic particle testing (MT) of fuel tubes,
- Damaged fuel can fit up and tack welding
- Machining of corner fuel tubes
- Fuel tube fit up, welding, and machining
- Fuel tube dimensional inspection

The team also reviewed a selection of shop travelers for a completed transportable storage canister (TSC) as a part of the review of final document package number MAG-TSCDF-30032-265-164 to determine if the travelers were being completed adequately. This document package review also included the final Certificate of Conformance, shop travelers, MT and dimensional inspection reports, and NCRs.

1.4.2 Observation and Findings

The team noted that Petersen personnel performed fabrication activities in a climate-controlled environment. The team found that the staff were generally knowledgeable about the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the MAGNASTOR. Additionally, the team assessed that fabrication activities were generally conducted in a safe and controlled manner. During the observation of fuel tube fit up, welding, and machining activities, the team found that the work was well controlled, individuals were knowledgeable of the applicable fabrication process, and the work was being performed in accordance with the applicable shop traveler and weld procedure specification (WPS).

No findings of significance were identified.

1.4.3 Conclusions

The team determined that the offsite fabricator's personnel were familiar with the specified design, designated fabrication techniques, testing requirements, and quality controls associated with the construction of the DCSS.

1.5 Procurement

1.5.1 Inspection Scope

The team determine whether: a) Materials, components, and other equipment received by the fabricator meet DCSS design procurement specifications, and b) The procurement specifications conform to the design commitments and requirements contained in the FSAR, CoC, and TS.

The team reviewed Petersen's process that addresses procurement, including traceability and receipt inspection, including a review of the following quality procedures:

PI-SOP-04-01, "Procurement Document Control Procedure," Revision 15
PI-SOP-07-01, "Material Receipt, Storage and Issue Procedure," Revision 13
PI-SOP-07-09, "Commercial Grade Dedication of Items, Services and Software," Revision 12

The team reviewed selected drawings and records and interviewed selected personnel to verify that the procurement specifications for materials, fabrication, inspection, and services performed at Petersen met design requirements of the MAGNASTOR TSCs. The team verified that NAC used a graded approach for identifying ITS components during the design process and Petersen applied this graded quality level to component and material procurement documents.

The team reviewed a sample of procurement documents for various MAGNASTOR Damaged Fuel TSC components.

1.5.2 Observation and Findings

The team observed that Petersen had adequate control of the procurement process for the ITS components reviewed. Petersen procured ITS components consistent with design requirements and their implementing procedures.

Petersen procured each component in accordance with a purchase order (PO) through their commercial grade dedication process. The team noted that Petersen performs all of its own dedication testing for critical characteristics in an on-site lab.

Petersen's material traceability, procurement, and receipt inspection controls were adequate. The team determined that the purchase orders were adequate and specified the applicable criteria and requirements including Part 21. The material ordered and received by Petersen met the design requirements, the critical characteristics and were adequate for the material dedicated. Additionally, Petersen verified and maintained the traceability throughout the procurement and receipt process. The team determined that Petersen purchased the components from vendors currently on the Petersen's Approved Vendors List (AVL).

No findings of significance were identified.

1.5.3 Conclusions

The team determined that materials, components, and other equipment received by the fabricator meet DCSS design procurement specifications, and the procurement specifications conform to the design commitments and requirements contained in the SFAR, CoC and TS.

1.6 Implementing Procedures

1.6.1 Inspection Scope

The team determined whether DCSS components are being fabricated per approved quality assurance (QA) and 10 CFR Part 21 implementing procedures and fabrication specifications.

The team evaluated Petersen's control of the fabrication process through observations, examinations of records, and personnel interviews in the areas of fabrication and assembly, test and inspection, and tools and equipment. The team observed several fabrication activities including MT, fuel tube and damaged fuel can welding, and fuel tube dimensional inspection. The team performed a detailed review of the shop travelers used to conduct the observed fabrication activities and the required WPSs referenced in the travelers for the welds being performed. The team also reviewed a selection of shop travelers for in-process work including TSC shells, damaged fuel cans, and fuel tubes to determine if the documents had been adequately completed to the current point in the fabrication process. In addition, a dye penetrant test (PT) report for a TSC shell currently being fabricated was reviewed by the team to determine if the inspection was performed in accordance with PSP-TSC-03, “Visual and Remote Liquid Penetrant Examination of Ferrous and Non-Ferrous Materials for NAC International Transportable Storage Canisters,” Revision 6.

The team reviewed selected measuring and test equipment (M&TE) including records and procedures to assure that equipment used in activities affecting quality were properly controlled and calibrated. The team reviewed PI-SOP-12-01, "General Calibration Procedure," Revision 18, which prescribes activities and requirements concerning control and use of M&TE including calibration to national standards and actions to take when any piece of equipment is found out of calibration. The team also interviewed personnel involved in the checking in and out of M&TE for use on the shop floor, control of out of calibration equipment, and equipment needing periodic recalibration. The team compared a sampling of M&TE used for recent fabrication and testing activities to the applicable requirements in PI-SOP-12-01 and overall compliance to the procedure. The team selected a MT yoke, weld machine, radiometer, and digital thermometer.

1.6.2 Observation and Findings

The team identified that Petersen personnel did not perform a MT examination in accordance with approved quality procedures. During observation of a MT inspection of a fuel tube seam weld on December 7, 2021, it was noted that the inspector utilized the MT yoke installed light bulb as the source of white light for the surface inspection. Step 8.1.1 of PI-SOP-09-02, Revision 8, states “[w]hen performing testing using non-fluorescent particles, the intensity of the white light at the testing surface shall be a minimum of (100 foot candles).” The team further questioned Petersen personnel on how the white light from the MT yoke was verified to meet the light intensity requirement of 100 foot candles. The team was informed, however, that the Petersen inspectors verify and document their hand-held flashlight meets the 100 foot candle requirement at the start of each day. Petersen personnel were then requested to demonstrate whether the white light from the MT yoke was adequate to meet the 100 foot candle requirement with a calibrated radiometer, but the light read at approximately 25 to 30 foot candles.

10 CFR 72.158, “Control of special processes” states, in part, that the certificate holder shall establish measures to ensure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

Contrary to the above, on December 7, 2021, a fabricator for certificate holder NAC did not ensure that special processes, including NDT, were accomplished in accordance with applicable specifications and criteria. Specifically, Petersen failed to perform MT inspection of a fuel tube seam weld with the required white light intensity of 100-foot candles.

The team dispositioned the violation using the traditional enforcement process in Section 2.3 of the Enforcement Policy. The team determined the violation was of more-than-minor safety significance in accordance with Inspection Manual Chapter (IMC) 0617, “Vendor and Quality Assurance Implementation Inspection Reports,” Appendix E, “Minor Examples of Vendor and QA Implementation Findings,” Example 10.b; because the lighting was less than the required minimum and when the welds were re-inspected, a previously unidentified indication was found. The team characterized the violation as a Severity Level IV violation in accordance with the NRC’s Enforcement Policy, Section 6.5. Petersen entered the issue into its CAP under P/CAR P940. Because this violation was of low safety significance and was entered into Petersen’s CAP, the issue was not repetitive or willful, this is being treated as a NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(72-1015/2021-201-03)**

1.6.3 Conclusions

The team determined that DCSS components were generally being fabricated and inspected per approved QA and 10 CFR Part 21 implementing procedures and fabrication specifications. One Severity Level IV NCV of 10 CFR 72.158, “Control of special processes” was identified for Petersen’s failure to perform an adequate MT inspection of a fuel tube seam weld.

1.7 10 CFR Part 21

1.7.1 Inspection Scope

With regard to fabrication activities, the team determined whether: a. They were conducted under an NRC-approved QAP (10 CFR 72.140). b. The provisions of 10 CFR Part 21, Reporting of Defects and Noncompliance for reporting defects that could cause a substantial safety hazard have been implemented. c. The fabricator's personnel are familiar with the reporting requirements of 10 CFR Part 21. d. The fabricator has complied with 10 CFR 21.6, "Posting requirements".

The team reviewed Petersen’s approved procedure PI-SOP-15-02, "10 CFR 21 Reporting," Revision 6 and interviewed personnel to determine if provisions were in place for reporting defects that could cause a substantial safety hazard from the NCRs and P/CARs identified and if personnel was familiar with the reporting requirements. This review included looking at some of the fabrication specifications to see if Petersen and NAC included the requirements of 10 CFR Part 21 in the specifications. The team also checked to see if Petersen posted the Part 21 postings in their office and fabrication facility.

1.7.2 Observation and Findings

The team assessed that Petersen has provisions in place for evaluating deviations and reporting defects, as required by 10 CFR Part 21. The team noted that Petersen did not have any Part 21 reports within the last six years. The team also noted that Petersen posted Part 21 requirements throughout their office and fabrication facility.

No findings of significance were identified.

1.7.3 Conclusions

The team determined that: fabrication activities were conducted under an NRC-approved QAP (10 CFR 72.140); the provisions of 10 CFR Part 21 were implemented; the fabricator's personnel were familiar with the reporting requirements of 10 CFR Part 21; and the fabricator complied with 10 CFR 21.6, "Posting requirements".

1.8 Oversight and Audits

1.8.1 Inspection Scope

With regard to QA activities, the team determined whether: a. The fabricator has been audited by either the licensee or CoC holder. b. For selected audits and inspection findings from (as applicable) QA audit or surveillance and/or inspection reports issued in the previous 2 years, the findings were appropriately handled with corrective actions implemented in a time frame commensurate with their safety significance. c. Supervision and QC/QA personnel perform appropriate oversight during fabrication activities.

The team reviewed the NAC audit program to determine if NAC scheduled, planned, and performed audits or surveillances of the fabricator (Petersen) in accordance with their QAP. The team selected a sample of audits and surveillances from the time of the last NRC inspection to the present. The team particularly focused on activities related to Petersen fabrication of the MAGNSTOR TSC. The team reviewed the audit results to determine if NAC identified deficiencies and Petersen addressed these deficiencies with their preventative and CAP. The team also evaluated whether NAC provided adequate supervision with QC/QA personnel for appropriate oversight during fabrication activities.

1.8.2 Observation and Findings

Overall, the team assessed that for the audits and surveillances sampled that NAC generally conducted oversight with qualified and certified personnel, scheduled and evaluated applicable quality of Petersen's QA program associated with fabrication activities. The team assessed that Petersen and NAC appropriately identified issues and implemented corrective actions in a time frame commensurate with their safety significance.

No findings of significance were identified.

1.8.3 Conclusions

The team determined, for the items selected for review, that the CoC holder is performing oversight and audits in accordance with their QAP.

2.0 Exit Meeting

The team presented the results of the inspection to Mr. B. Greene and other members of the NAC and Petersen staff at an exit meeting on December 9, 2021. The CoC holder acknowledged the results presented and did not identify any of the information discussed as proprietary.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

W. Woolsey, Petersen Project Manager
B. Maez, Petersen Director of Quality
B. Greene, NAC Vice President of Quality
M. Read, Petersen Quality Assurance Manager

INSPECTION PROCEDURES USED

IP 60852 ISFSI Component Fabrication by Outside Fabricators

ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
72-1015/2021-201-01	Opened	NCV	10 CFR 72.48
72-1015/2021-201-02	Opened	NCV	10 CFR 72.150
72-1015/2021-201-03	Opened	NCV	10 CFR 72.158

PARTIAL LIST OF DOCUMENTS REVIEWED

The team identified the documents reviewed during the inspection in the report details above.

LIST OF ACRONYMS USED

ACI	American Concrete Institute
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
ASTM	American Standard Testing and Material
AVL	Approved Vendors List
CAP	Corrective action program
CoC	Certificate of compliance
DCR	Design change requests
DCSS	Dry cask storage system
FSAR	Final Safety Analysis Report
ISFSI	Independent spent fuel storage installation
ITS	Important to safety
M&TE	Measuring and test equipment
MT	Magnetic particle testing
NCV	Non-Cited Violation
NDT	Nondestructive testing
NRC	Nuclear Regulatory Commission
PO	Purchase order
PT	Penetrant test
QA	Quality assurance
QAP	Quality Assurance Program

SAR	Safety analysis report
SER	Safety evaluation report
SOP	Standard operating procedures
TS	Technical specifications
TSC	Transportable storage canister
VNCR	Vendor nonconformance report
WPS	Weld procedure specification

~~**Proprietary Information – Withhold from Public Disclosure in Accordance with 10 CFR 2.390**~~

Enclosure 5

NAC International Finding Report 22-001

Enclosure 6

Submission of Amendment Request for the NAC International MAGNASTOR Cask System
Amendment No. 12 (ADAMS Accession No. ML22024A374)
January 24, 2022

NAC INTERNATIONAL

Atlanta Corporate Headquarters
3930 East Jones Bridge Road, Suite 200
Norcross, GA 30092
Phone 770-447-1144
www.nacintl.com

January 24, 2022

U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Attn: Document Control Desk

Subject: Submission of an Amendment Request for the NAC International MAGNASTOR® Cask System Amendment No. 12

Docket No. 72-1031

References:
1. U.S. Nuclear Regulatory Commission (NRC) Certificate of Compliance (CoC) No. 1031 for the NAC International MAGNASTOR Cask System, Amendment No. 9, December 7, 2020
2. MAGNASTOR Cask System Final Safety Analysis Report (FSAR), Revision 12, NAC International, September 2021

NAC International (NAC) hereby submits a request to amend the description section in Reference 1 and Technical Specification (TS) Appendix A, Section 4.2, Paragraph 3. In Reference 1, this paragraph applies American Concrete Institute Specifications ACI-349 and ACI-318 to the CONCRETE CASK, which is a defined term in the TSs. The definition for CONCRETE CASK does not delineate any subcomponents that make up the "vertical storage module" CONCRETE CASK. Specifically, the concrete cask lid.

This subcomponent is a thick concrete and carbon steel closure for the concrete cask. The licensing basis design function for the lid is to reduce skyshine radiation and to protect the transportable storage canister (TSC) from the environment and postulated tornado missiles, as described in Reference 2, Section 1.3.1.3. However, there are no licensing basis structural requirements for the concrete in the lid, whether there is any embedded rebar or not. The tornado missile impact and lift evaluation do not take credit for the concrete. Thus, the only relevant licensing basis design requirement for the lid is for radiation shielding, which is evaluated in Reference 2, Section 5.1.2.

Currently in Reference 2, Chapter 1, Table 1.3-4, are the relevant concrete cask lid concrete specification requirements relevant to ACI-318, which include those requirements needed for adequate radiation shielding as discussed in Reference 2. Via this amendment, NAC is requesting the TSs be revised to provide a reference directly to this table for the construction of the concrete cask lid. Enclosure 1 of this letter provides the proposed changes to the TS in tracked changes format. Currently, NAC has two amendment applications before the NRC known as Amd. 10 and 11 that are likely to be processed through rulemaking together. NAC is requesting a speedy review of this Amd. 12 submittal such that it can be processed through rulemaking together with Amds. 10 and 11. If during the review that appears to not be likely, NAC would like to have a teleconference to discuss possible scenarios of processing these three amendments through rulemaking.

If you have any comments or questions, please contact me on my direct line at 678-328-1236.

Sincerely,

Wren Fowler Digitally signed by Wren Fowler
Date: 2022.01.24 13:24:50
-05'00'

Wren Fowler
Director, Licensing
Engineering

Enclosure:
Enclosure 1 – Proposed Technical Specification Changes

Enclosure 1

Proposed Technical Specification Changes

MAGNASTOR®, Amendment 12

(Docket No 72-1031)

NAC International

January 2022

MAGNASTOR Certificate of Compliance, Amendment 9

Description, 4th Paragraph

The concrete cask is the storage overpack for the TSC and provides structural support, shielding, protection from environmental conditions, and natural convection cooling of the TSC during long-term storage. The concrete cask body is a reinforced concrete (Type II Portland cement) structure with a carbon steel inner liner. The liner inner diameter incorporates standoffs to minimize impact loads on the TSC and to maintain convective heat flow paths under accident conditions. The concrete cask has an annular air passage to allow a passive convection air flow around the TSC. The air inlets and outlets are offset in elevation from the TSC to minimize radiation streaming. The spent fuel decay heat is transferred from the fuel assemblies to the TSC shell using pressurized helium circulated by convection through the fuel basket, conduction and radiation. Heat flows by convection from the TSC shell to the circulating air and by radiation from the TSC shell to the concrete cask liner. The heated air is exhausted, by convective flow, through the concrete cask air outlets. The top of the concrete cask is closed by a carbon steel lid with concrete shielding and is~~concrete lid~~ bolted in place.

Technical Specification (TS) Appendix A, Section 4.2

4.2 Codes and Standards

The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), 2001 Edition with Addenda through 2003, Section III, Subsection NB, is the governing Code for the design, material procurement, fabrication, and testing of the TSC.

The ASME Code, 2001 Edition with Addenda through 2003, Section III, Subsection NG, is the governing Code for the design, material procurement, fabrication and testing of the spent fuel baskets.

The American Concrete Institute Specifications ACI-349 and ACI-318 govern the CONCRETE CASK design and construction, respectively,~~.~~ with the following exception:

- For concrete cask lids that do not credit the embedded concrete in any licensing basis structural evaluation, the applicable ACI-318 requirements to be met are specified in FSAR, Chapter 1, Table 1.3-4. For cask concrete other than that in the concrete cask lid, FSAR, Chapter 1, Table 1.3-3 applies.

The American National Standards Institute ANSI N14.6 (1993) and NUREG-0612 govern the TRANSFER CASK design, operation, fabrication, testing, inspection, and maintenance.

~~**Proprietary Information – Withhold from Public Disclosure in Accordance with 10 CFR 2.390**~~

Enclosure 7

Supplement to Amendment Request for the NAC International MAGNASTOR Cask System
Amendment No. 12

Enclosure 8

NAC International Affidavit for Enclosures 3, 5 and 7

NAC INTERNATIONAL

NAC INTERNATIONAL
AFFIDAVIT PURSUANT TO 10 CFR 2.390

George Carver (Affiant), Vice President, Engineering and Support Services, hereinafter referred to as NAC, at 3930 East Jones Bridge Road, Peachtree Corners, Georgia 30092, being duly sworn, deposes and says that:

1. Affiant has reviewed the information described in Item 2 and is personally familiar with the trade secrets and privileged information contained herein and is authorized to request its withholding.

2. The information to be withheld includes the following NAC Proprietary Information that is being provided in support of the NRC review of Exemption to the Requirements of Certificate of Compliance No. 1031 for the NAC MAGNASTOR Storage System.

   - Enclosure 3 – ED20220031 NAC Finding Report (FR No. 22-001) Impact to Safety
   - Enclosure 5 – NAC International Finding Report 22-001
   - Enclosure 7 – ED20220032, Supplement to NAC's Amendment Request for the NAC MAGNASTOR Cask System Amendment No. 12, Enclosure 2, Potential Concrete Cask Radial Shrinkage MCNP6 Evaluation

   NAC is the owner of this information that is considered to be NAC Proprietary Information.

3. NAC makes this application for withholding of proprietary information based upon the exemption from disclosure set forth in: the Freedom of Information Act ("FOIA"); 5 USC Sec. 552(b)(4) and the Trade Secrets Act; 18 USC Sec. 1905; and NRC Regulations 10 CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial financial information obtained from a person, and privileged or confidential" (Exemption 4). The information for which exemption from disclosure is herein sought is all "confidential commercial information," and some portions may also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4.

4. Examples of categories of information that fit into the definition of proprietary information are:

   a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by competitors of NAC, without license from NAC, constitutes a competitive economic advantage over other companies.

   b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality or licensing of a similar product.

   c. Information that reveals cost or price information, production capacities, budget levels or commercial strategies of NAC, its customers, or its suppliers.

   d. Information that reveals aspects of past, present or future NAC customer-funded development plans and programs of potential commercial value to NAC.

e. Information that discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information that is sought to be withheld is considered to be proprietary for the reasons set forth in Items 4.a, 4.b, and 4.d.

5. The information to be withheld is being transmitted to the NRC in confidence.

6. The information sought to be withheld, including that compiled from many sources, is of a sort customarily held in confidence by NAC, and is, in fact, so held. This information has, to the best of my knowledge and belief, consistently been held in confidence by NAC. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements, which provide for maintenance of the information in confidence. Its initial designation as proprietary information and the subsequent steps taken to prevent its unauthorized disclosure are as set forth in Items 7 and 8 following.

7. Initial approval of proprietary treatment of a document/information is made by the Vice President, Engineering, the Project Manager, the Licensing Specialist, or the Director, Licensing – the persons most likely to know the value and sensitivity of the information in relation to industry knowledge. Access to proprietary documents within NAC is limited via "controlled distribution" to individuals on a "need to know" basis. The procedure for external release of NAC proprietary documents typically requires the approval of the Project Manager based on a review of the documents for technical content, competitive effect and accuracy of the proprietary designation. Disclosures of proprietary documents outside of NAC are limited to regulatory agencies, customers and potential customers and their agents, suppliers, licensees and contractors with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

8. NAC has invested a significant amount of time and money in the research, development, engineering and analytical costs to develop the information that is sought to be withheld as proprietary. This information is considered to be proprietary because it contains detailed descriptions of analytical approaches, methodologies, technical data and/or evaluation results not available elsewhere. The precise value of the expertise required to develop the proprietary information is difficult to quantify, but it is clearly substantial.

   Public disclosure of the information to be withheld is likely to cause substantial harm to the competitive position of NAC, as the owner of the information, and reduce or eliminate the availability of profit-making opportunities. The proprietary information is part of NAC's comprehensive spent fuel storage and transport technology base, and its commercial value extends beyond the original development cost to include the development of the expertise to determine and apply the appropriate evaluation process. The value of this proprietary information and the competitive advantage that it provides to NAC would be lost if the information were disclosed to the public. Making such information available to other parties, including competitors, without their having to make similar investments of time, labor and money would provide competitors with an unfair advantage and deprive NAC of the opportunity to seek an adequate return on its large investment.

NAC INTERNATIONAL

NAC INTERNATIONAL
AFFIDAVIT PURSUANT TO 10 CFR 2.390 (continued)

STATE OF GEORGIA, COUNTY OF GWINNETT

Mr. George Carver, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated herein are true and correct to the best of his knowledge, information and belief.

Executed at Peachtree Corners, Georgia, this 3rd day of March, 2022.

George Carver
Vice President, Engineering and Support Services
NAC International

Subscribed and sworn before me this 3rd day of March, 2022.

Notary Public

HEATH MICHAEL BALDNER
My Commission Expires
NOTARY PUBLIC
07-20-2024
FORSYTH COUNTY, GEORGIA