UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

November 26, 2013

Mr. Tom E. Tynan
Vice President
Southern Nuclear Operating Company, Inc.
Vogtle Electric Generating Plant
7821 River Road
Waynesboro, GA 30830

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT - NRC INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION REPORT NOS. 05000424/2013009, 05000425/2013009, and 07201039/2013002

Dear Mr. Tynan:

On October 25, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vogtle Electric Generating Plant (VEGP) Units 1 and 2, and the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

This inspection involved a review of the preoperational demonstrations (the dry runs) and initial loading activities of spent fuel into the Independent Spent Fuel Storage Installation (ISFSI) facility, as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspection covered many aspects associated with the preparation, movement, and placement of spent fuel into the ISFSI facility, and consisted of field observations, extensive examination of procedures and documents, and interviews with personnel. The inspectors reviewed dry run preparations and determined that they were thorough, and that individuals were appropriately trained and qualified in the performance of ISFSI-related tasks. The inspectors observed sound, conservative decision-making throughout the performance of the dry run, and the initial loading of spent fuel into the ISFSI facility.

The NRC inspectors did not identify any findings or violations of more than minor significance.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public inspections, exemptions, requests for withholding," of the NRC's "Rules of Practice," a copy of this letter, its Enclosure, and your response (if any), will be available electronically for public inspection in the NRC's Public Document Room, or from the Publicly Available Records (PARS)

component of the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

RA

Steven J. Vias, Chief
Engineering Branch 3
Division of Reactor Safety

Docket Nos.: 50-424, 50-425, and 72-1039
License Nos.: NPF-68 and NPF-81

Enclosure:
IR 05000424/2013009, 05000425/2013009,
and 07201039/2013002
w/Attachment: Supplementary Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-424, 50-425, and 72-1039
License Nos:	NPF-68 and NPF-81
Report Nos:	05000424/2013009, 05000425/2013009, and 07201039/2013002
Licensee:	Southern Nuclear Operating Company, Inc. (SNC)
Facility:	Vogtle Electric Generating Plant, Units 1 and 2
Location:	7821 River Road Waynesboro, GA 30830
Dates:	September 23, 2013 – October 25, 2013
Team Leader:	Robert Carrion, Senior Reactor Inspector, Region II
Inspectors:	Robert Prince, Fuel Facilities Inspector, Region II Jack Parrott, Safety Inspection Engineer, Office of Nuclear Materials Safety and Safeguards (NMSS), Division of Spent Fuel Storage and Transportation (SFST) Zhian Li, Senior Criticality and Shielding Engineer, NMSS Mike Cain, Senior Resident Inspector - Vogtle Tim Chandler, Resident Inspector - Vogtle
Approved by:	Steven J. Vias, Chief Engineering Branch 3 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000424/2013009, 05000425/2013009, and 07201039/2013002; Vogtle Electric Generating Plant, Units 1 and 2, spent fuel pre-loading demonstration and initial loading of the Independent Spent Fuel Storage Installation (ISFSI).

This report covers onsite inspection and in-office review by resident, regional, and Headquarters-based inspectors of activities related to the dry cask storage of spent fuel, including the preparation for loading of spent fuel from the spent fuel pool (SFP) to its placement at the ISFSI using the Holtec System. Upon completion of the dry run demonstrations on October 18, 2013, the licensee began activities to begin the transfer of spent fuel to the onsite ISFSI on October 28, 2013.

The inspectors reviewed the preoperational loading activities to confirm that personnel had been trained, equipment had been tested, and station programs and procedures had been developed, and were adequate to safely load spent fuel into the ISFSI. The inspectors also observed selected portions of the initial spent fuel processing, and transfer to the ISFSI, to confirm that these activities were performed safely, in accordance with the approved procedures, the Certificate of Compliance (CoC), and Technical Specification (TS) requirements.

REPORT DETAILS

Summary of Facility Activities

Southern Nuclear Operating Company, Inc. (SNC) selected the Holtec HI-STORM 100 systems for storage of spent fuel in the Vogtle Electric Generating Plant (VEGP) ISFSI. The HI-STORM 100 system has been reviewed and approved by the Nuclear Regulatory Commission (NRC) and Certificate of Compliance (CoC) number 1014 issued, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 72.238 to Holtec International (i.e., the CoC holder). The HI-STORM 100 cask system CoC 1014 is included in the list of NRC-approved casks provided in 10 CFR 72.214, and is therefore acceptable for use in accordance with the general license provisions of Part 72, Subpart K. The SNC elected to use Amendment 7 to the CoC, which became effective on December 28, 2009.

Demonstrations of loading, processing, and moving spent fuel from the SFP to the ISFSI, using the Holtec system, were conducted from September 23 – 26, 2013 and October 14 – 18, 2013, for the NRC. During this period, the inspectors performed an evaluation to determine if the ISFSI personnel had been trained, the equipment had been tested, and the procedures had been developed to the extent necessary to safely load spent fuel into dry storage at the site's ISFSI. During the period from October 21 – 25, NRC inspectors observed activities associated with the initial loading of spent fuel into dry storage to ensure that those activities were performed safely, in accordance with approved procedures, within the technical specifications (TS) limits, and to determine if the SNC programs were adequate for continued operation, and maintenance of the ISFSI once the ISFSI was loaded.

4OA5 Other Activities

.1 Vogtle Independent Spent Fuel Storage Activities

.1.1 Preoperational Test Program

a. Inspection Scope (Inspection Procedure 60854)

The CoC for the Holtec system for the storage of irradiated fuel requires the licensee to conduct preoperational testing to demonstrate the loading, closure, and transfer of the cask system prior to the first loading of spent fuel assemblies. The NRC conducted an onsite inspection to observe the licensee's demonstration of the required activities. The inspection consisted of field observations, interviews with licensee personnel, and review of licensee documentation.

From CoC Condition 10, Preoperational Testing and Training Exercise, "A dry run training exercise of the loading, closure, handling, unloading, and transfer of the HI-STORM 100 Cask System shall be conducted by the licensee prior to the first use of the system to load spent fuel assemblies. The training exercise shall not be conducted with spent fuel in the MPC. The dry run may be performed in an alternate step sequence from the actual procedures, but all steps must be performed."

From September 23 – 26, 2013, the inspectors observed the "dry ops" portion of the dry run, which included transporting the HI-TRAC, that contained a multi-purpose canister (MPC) with a dummy load of the same weight as the actual load from the cask washdown area (CWA), to the low profile transporter (LPT) in the rail bay, moving the LPT outside of the Auxiliary Building where the loaded HI-TRAC was transferred to the Vertical Cask Transporter (VCT). The inspectors also observed the VCT carry the loaded HI-TRAC along the heavy haul path to the cask transfer facility (CTF), and transferred the MPC from the HI-TRAC into the HI-STORM 100, placed the lid on the HI-STORM 100, lifted the loaded HI-STORM 100 out of the CTF, and move the loaded HI-STORM 100 to a temporary ISFSI pad location for dose rate surveying, and then placed it in its designated storage location on the ISFSI pad. The inspectors noted that all activities were done in conjunction with the draft ISFSI procedures developed by the VEGP.

During movement of the dummy-loaded HI-STORM from the CTF to the temporary surveying location on the ISFSI pad, the boom on the VCT was raised to disengage the cam locks so that the HI-STORM could be lowered to the pad. During the raising process, when the HI-STORM was approximately 3 inches off the pad, a loud pop was heard coming from one of the booms on the VCT. There was no change in load value on the boom when the sound occurred, indicating that there was no load drop. However, the licensee put the load in a safe configuration, initiated a "time out" on the work, issued a condition report, and consulted with the VCT vendor, Holtec, and site engineering. The engineering team concluded that the rate of raising the boom with a fully loaded HI-STORM needed to be reduced to properly disengage the cam lock before lowering the load. These activities were observed by the inspectors who determined that the licensee's response to the event was appropriate.

During the period of October 15 – 17, 2013, the resident inspectors observed the "wet ops" dry run activities, which included moving the HI-TRAC containing the empty MPC into the cask loading pit of the SFP, loading dummy fuel assemblies into the MPC (including independent verification), selection and verification of fuel assemblies to ensure conformance with appropriate loading configuration requirements, installing the closure lid, removal of the HI-TRAC from the SFP, and moving it to the CWA. The licensee conducted a pre-job briefing each day during the demonstration with personnel involved with the dry run activities. The briefings were comprehensive and effectively covered all key aspects of the evolution, including procedural adherence expectations, safety aspects of the activities, and Quality Assurance (QA) hold points. Procedure compliance was followed during the performance of the activities. Radiological conditions were simulated, and appropriate measures implemented to provide a degree of realism, including simulated radiological postings to prepare workers for the radiological conditions that could be encountered during actual transfer of spent fuel. The inspectors interviewed cognizant personnel to verify their knowledge of procedural requirements and responsibilities. The inspectors also noted that activities were performed in a deliberate manner. The responsible supervisor maintained the work package/procedure in his possession throughout the performance of the activity, and procedural steps were carefully followed.

The licensee demonstrated the capability to safely place the MPC into the HI-TRAC. Rigging, movement, and placement of the MPC into the HI-TRAC, and subsequently into the HI-STORM, were performed in a controlled manner with good coordination, and communication observed among individuals involved in the activity. Throughout the entire dry run exercise, the work package was periodically reviewed by the inspectors to verify compliance with procedures, and related work documents. The inspectors noted that procedure steps were initialed, or otherwise notated, by the responsible supervisor to signify completion of a given step, and that work order documents were followed.

The ISFSI project personnel were qualified to perform their assigned functions and were knowledgeable of their responsibilities. Procedures and work-related documentation were accurate and procedural compliance was demonstrated by workers in the field.

b. Findings

No findings were identified.

.1.2 Review of Evaluations

a. Inspection Scope (Inspection Procedures 60856 and 60857)

A general license for the storage of spent fuel in an ISFSI at power reactor sites is granted per 10 CFR 72.210, "General license issued." Per 10 CFR 72.212, "Conditions of general licenses issued under 72.210," the holder of the general license is required to perform written evaluations prior to use (specifically under 72.212(b)(5)) to establish that the ISFSI design can be used at that site, and that site operations can accommodate operation of an ISFSI. The VEGP holds a general license for operation of its ISFSI.

The VEGP documented the results of the required evaluations in the VEGP 10 CFR 72.212 Report, Version 1.0. The inspectors reviewed the technical report and various referenced supporting documents to evaluate the licensee's compliance with the requirements of 10 CFR 72.212. The inspectors also conducted interviews with cognizant licensee personnel.

10 CFR 72.212 Report

The inspectors reviewed a copy of the VEGP 10 CFR 72.212 Report, Version 1.0. Based on the review, the inspectors assessed that, overall, the report was comprehensive and adequately addressed the areas required to be evaluated under 10 CFR 72.212(b)(5) through (13). The 10 CFR 72.212 report was found to be acceptable; it contained sufficient objective evidence that the written evaluations confirmed that the conditions set forth in the CoC had been met, the ISFSI pad had been designed to support the stored load of the casks, and the requirements of 10 CFR 72.104 had been met for the radiological impact to members of the public.

Fire and Explosion Analysis of Hauling and Storage

The inspectors reviewed the supporting documents referenced in the 10 CFR 72.212 evaluation report, including the fire hazards analysis for the VCT, the fire hazards analysis for spatial separation requirements for combustion sources for the Vogtle Units 1 and 2 ISFSI, and the evaluation of the thermal effects of the combustion of onsite gasoline and diesel fuel storage tanks on spent fuel transport to, and storage at, the ISFSI. The inspectors verified that the calculations and analysis had been completed, including the specifications of the Vogtle ISFSI and HI-STORM 100 system, and contained conservative assumptions and identified any required operational restrictions based on the results of the calculations. The inspectors reviewed the calculation and analysis documents and did not identify any concerns that would contradict the conclusion made by VEGP.

HI-STORM 100 and Independent Spent Fuel Storage Installation Dose Limits

In 10 CFR 72.104, criteria for radioactive materials in effluents and direct radiation from an ISFSI or Monitored Retrievable Storage Installation (MSRI), requires that the annual dose equivalent to any real individual, located beyond the controlled area, must not exceed 25 millirem (mrem) to the whole body, 75 mrem to the thyroid, and 25 mrem to any other critical organ, as a result of exposure to direct radiation from ISFSI operations. Section 6.0 of the 10 CFR 72.212 report provides the evaluation of meeting the dose requirements of 10 CFR 72.104. The Vogtle ISFSI pad is located within the plant's protected area, with a minimum distance to the nearest owner controlled boundary of approximately 1,142 meters. The ISFSI will contain a maximum of 20 HI-STORM 100 MPC-32 canisters. The report describes the results of calculations that show the annual offsite dose contribution from direct radiation, to the closest real individual due to the ISFSI, to be 0.3 mrem. The estimated annual dose due to power generation at VEGP Units 1 and 2 is 5.4 mrem. Therefore, the total annual dose to the closest real individual is within the 10 CFR 72.104(a) limit.

Independent Spent Fuel Storage Installation Pad Parameters

In accordance with 10 CFR 72.212(b)(5)(ii), VEGP is required to make a finding that the ISFSI pad and area can support the static and dynamic loads of the number of fully loaded HI-STORM 100 systems that will be placed on its ISFSI pad, considering the amplification of earthquakes through soil structure interaction, and soil liquefaction potential or other soil instability due to vibratory ground motion. Section 5.0 of the VEGP 72.212 report contains a summary of the analysis performed by Holtec International for VEGP.

The VEGP storage pad is designed to support the static and dynamic loads of 20 loaded Holtec HI-STORM 100 cask systems in a 4x5 array. However, as indicated in the VEGP 72.212 report, the VEGP ISFSI combination of pad thickness and concrete compressive strength does not meet the pre-approved set of ISFSI pad design criteria listed in the HI-STORM FSAR. Accordingly, a site-specific structural/seismic analysis was performed to qualify the VEGP ISFSI pad, consistent with the requirements of CoC 1014, Appendix B, Section 3.4.3.a.

The inspectors verified that the site-specific analysis concluded that the cask storage pad is designed to adequately support the static and dynamic loads of the stored casks in accordance with the requirements of 10 CFR 72.212(b)(5)(ii), and that the storage pad design and construction are consistent with the requirements of CoC 1014 and the assumptions contained in the HI-STORM 100 system Final Safety Analysis Report (FSAR). The site-specific analysis provides assurance that the FSAR analysis is bounding for the VEGP ISFSI and that the ISFSI pad and area can support the static and dynamic loads of the number of fully loaded HI-STORM 100 systems that will be on the VEGP ISFSI pad.

Site-Specific Parameters

The 10 CFR 72.212(b)(6) requires general licensees to review the Safety Analysis Report (SAR) referenced in the CoC, and the related NRC Safety Evaluation Report (SER), prior to use of the general license to determine whether or not the reactor site parameters, including analyses of ambient temperature and temperature extremes, flooding, effects of tornados, earthquake intensity and seismic acceleration, lightning, snow and ice loads, and burial under debris, are enveloped by the cask design bases considered in these reports.

The inspectors determined that the licensee performed a review, documented in the 10 CFR 72.212 report, of the reactor site parameters that are evaluated in the certification of the design of the HI-STORM 100 system, to ensure compliance with the requirements of 10 CFR 72, Subpart K, “General License for Storage of Spent Fuel at Power Reactor Sites.” The inspectors determined that the applicable reactor site parameters were evaluated for acceptability with the bounding values specified in the HI-STORM 100 SAR, and the NRC SER. The evaluations demonstrated that the design features for the HI-STORM 100 system either enveloped the site-specific characteristics of the VEGP site, enveloped the site-specific characteristics of the VEGP with

administrative controls on the implementation of the HI-STORM 100 system (e.g., limiting use of the HI-TRAC in an outside temperature less that 32ºF), performed a site-specific analysis to demonstrate bounding of site-specific parameters (e.g., ISFSI pad loading), or were not applicable (e.g., snow loading on the CTF).

Conformance to the Conditions of the Certificate of Compliance

The 10 CFR 72.212(b)(5)(i) requires the general licensee to perform written evaluations, before use, which establish that the cask, once loaded with spent fuel, will conform to the terms, conditions, and specifications of a CoC. The inspectors reviewed how VEGP complied with the conditions of the CoC for preoperational testing and training exercise of the HI-STORM 100 Cask System at VEGP. Attachment A of the VEGP 72.212 report, entitled "HI-STORM 100 Cask System Certificate of Compliance Evaluation," contains a tabulation of the applicable conditions for the HI-STORM 100 Cask System and VEGP. The inspectors reviewed the implementation of several of these conditions at VEGP and verified that they had been performed, or were captured, in the procedures established for the HI-STORM 100 loading at VEGP.

10 CFR 72.48 Screening and Evaluation

Holtec in authorized by 10 CFR 72.48 to make changes to the NRC-approved CoC for the HI-STORM 100 system, provided that those changes are reviewed to determine if the changes would hinder or prevent a system, structure, or component (SSC) of the HI-STORM 100 system to perform its design function as described in the HI-STORM FSAR. Holtec has made changes to the HI-STORM FSAR using this authority and has screened them for impacts to the SSCs. The inspectors verified that SNC also reviewed these changes for impacts to the SSCs and agreed that none of the changes required prior NRC approval (i.e., a CoC amendment).

Likewise, VEGP is granted authority to make changes to the HI-STORM 100 system design, or FSAR description, in accordance with the provisions of 10 CFR 72.48. The site-specific changes made to the HI-STORM 100 cask system by VEGP were identified in the 72.212 report. The inspectors verified that these changes were screened using the VEGP 72.48 screening process, concluding that none of the changes adversely impacted the HI-STORM 100 SSCs.

10 CFR 50.59 Screening and Evaluation

Movement of the HI-TRAC 125 transfer cask from the auxiliary building to the CTF; transfer of the MPC from the HI-TRAC 125 to the HI-STORM 100 overpack at the CTF; and movement of the loaded HI-STORM 100 system to its designated storage position in the ISFSI, were evaluated by VEGP to determine the potential for these activities to impact Part 50 SSCs important to safety. The licensee designed the heavy haul road to support the weight of the VCT to carry a loaded HI-STORM 100 overpack. Underground conveyances were either relocated or analyzed, to provide assurance that reactor SSCs considered important to safety will continue to perform their intended safety function, as described in the VEGP FSAR. To assure that SSCs considered important to safety will continue to perform their intended safety function, VEGP restricted movement of the

VCT to the heavy load path. The inspectors confirmed that the operation of the ISFSI, and changes to the Part 50 facility, were reviewed by the licensee in accordance with the provisions of 10 CFR 50.59(c), and a determination made that they do not involve a change to the facility's TS, or a license amendment, pursuant to 10 CFR 50.90. Therefore, the licensee determined that prior NRC approval, in the form of a license amendment or change to the TS, was not required. Accordingly, the licensee determined that it was in compliance with the requirements of 10 CFR 72.212(b)(8) for operation of the VEGP ISFSI in accordance with the general license provisions of 10 CFR Part 72, Subpart K.

b. Findings

No findings were identified.

.1.3 Fuel Characterization and Verification

a. Inspection Scope (Inspection Procedure 60854)

The CoC for the Holtec dry cask storage system specifies the parameters that must be met in order to allow spent fuel to be stored at the ISFSI. The inspectors evaluated licensee programs to verify that spent fuel assemblies selected for storage met the applicable requirements of the CoC. The inspection consisted of interviews with licensee personnel and review of documentation.

The inspectors reviewed the licensee's process for selecting and verifying fuel assemblies for placement in the MPC. The inspectors reviewed documents associated with the qualification, characterization, and selection of fuel assemblies for storage at the ISFSI. Technical Specifications require that selected fuel assemblies be visually inspected, independently identified, be free of cladding defects, and be within specified limits for such parameters as fuel enrichment, burn-up, and decay heat output. The inspectors discussed the fuel selection process with licensee personnel and determined that individuals were knowledgeable of the TS requirements. The inspectors reviewed documentation of visual fuel examinations performed for the 32 fuel assemblies to be loaded into the MPC (serial number 212), which was loaded into the HI-STORM 100 overpack (serial number 573) and placed on the ISFSI pad.

Examinations were performed in accordance with approved procedures. The inspectors noted that the selected fuel assemblies met all the appropriate TS requirements for placement into a MPC for dry storage. Supporting documentation adequately characterized the selected fuel assemblies for loading into a MPC.

The licensee had developed a cask loading plan in accordance with approved procedures. Licensee documentation supported the proper characterization of fuel assemblies to be loaded into a Holtec MPC, and was in compliance with design parameters specified in the CoC.

b. Findings

No findings were identified.

.1.4 Records

a. Inspection Scope (Inspection Procedure 60854)

The 10 CFR 72.72 requires that a licensee keep records showing the receipt, inventory (including location), disposal, acquisition, and transfer of all special nuclear material (SNM). In addition, 10 CFR 72.212(b) requires that a licensee maintain a copy of the CoC, and documents referenced therein, for each cask model used for storage of spent fuel, until use of the cask model is discontinued, and that a copy of the 10 CFR 72.212 Evaluation Report shall be retained until spent fuel is no longer stored under the general license issued under 10 CFR 72.210.

Additional general license requirements dealing with the review of the reactor emergency plan, quality assurance program, training program, and radiation protection program must also be satisfied pursuant to 10 CFR 72.212(b)(10). Records and procedural requirements for the general license holder are described in 10 CFR 72.212(b)(11), (12), (13), and (14).

The licensee had established records for SNM accountability. The inspectors reviewed procedures 93641-C; Development and Implementation of the Fuel Shuffle Sequence Plan, 93662-C; Spent Fuel Pool Inventory and ICA Maps, and NMP-RE-003; The Use and Administration of TracWorks and its Database, which tracked the locations at which the fuel assemblies are stored in the SFP.

The inspectors also reviewed procedure NF-212-F10, MPC-32 Loading Plan, which outlined the steps for identifying the fuel assemblies to be loaded, placing the fuel assemblies into the MPC, and verifying that the MPC had been correctly loaded. The inspectors reviewed procedure ES-ESDCS-003, Dry Storage Document Retention, which established measures by the licensee to ensure that the 10 CFR 72.212 Report, CoC, and related documents were being maintained for as long as spent fuel was stored at the ISFSI. The inspectors noted that the licensee had made the required 90-day notification to the NRC prior to loading their first cask on the ISFSI, and had established procedural requirements to register each cask with the NRC within 30 days after loading, per procedure 93711-C, HI-STORM System Site Transport.

The inspectors reviewed selected referenced records and procedure changes related to the emergency preparedness, fire protection, training, health physics, and quality assurance programs. The inspectors interviewed cognizant personnel to confirm that they were knowledgeable of the impact of ISFSI-related activities. For instance, the inspectors interviewed Emergency Preparedness management, with respect to coordination with offsite organizations, that may be called upon to respond during a major fire at the plant. The inspectors also interviewed the Emergency Preparedness Manager concerning the Emergency Action Levels (EALs) associated with ISFSI operations. The emergency plan, quality assurance program, training program, radiation protection program, and fire protection program had been evaluated, and their effectiveness was determined not to be decreased by ISFSI activities.

b. Findings

No findings were identified.

.1.5 Procedures and Technical Specifications

a. Inspection Scope (Inspection Procedure 60854)

The CoC for the Holtec International HI-STORM 100 cask system, in conjunction with the associated TS (Appendix A to CoC 1014, Amendment 7), specifies requirements to ensure the safe handling and storage of spent nuclear fuel. The inspectors confirmed that copies of the CoC and referenced documents were current.

The inspectors reviewed licensee procedures and documentation to confirm that the TS requirements were incorporated into ISFSI work-related documents and work packages. The inspectors noted that TS requirements were incorporated into a series of ISFSI-related procedures. The licensee developed procedures to address preparing the HI-TRAC/MPC to receive spent fuel assemblies; placing the MPC into the HI-TRAC; moving the HI-TRAC/MPC into the SFP to receive spent fuel assemblies; removing the HI-TRAC/MPC from the SFP for de-watering, welding, vacuum drying, and helium backfilling; transferring the MPC from the HI-TRAC to the HI-STORM storage overpack; preparing the HI-STORM storage overpack for transport to the ISFSI; and retrieving the MPC from the HI-STORM storage overpack. The procedures were comprehensive and adequately addressed key aspects of the evolutions. The procedures contained sufficient detail to support safe handling and movement of the MPC, HI-TRAC, and HI-STORM storage overpack. The inspectors noted that the procedures covered all aspects of dry spent fuel handling, loading, and storage requirements, as required by the TSs.

The inspectors verified that there were adequate procedures to monitor the thermal performance of the HI-STORM storage overpacks.

b. Findings

No findings were identified.

.1.6 Quality Assurance Program

a. Inspection Scope (Inspection Procedure 60854)

Per CoC 1014, Condition 4, Quality Assurance (QA), activities at the ISFSI shall be conducted in accordance with a Commission-approved quality assurance program that satisfies the applicable requirements of 10 CFR Part 72, Subpart G, Quality Assurance, and which is established, maintained, and executed with regard to the cask system. The 10 CFR 72.140(d), Previously-approved programs, accepts a quality assurance program previously approved by the Commission which satisfies the requirements of Appendix B to Part 50 to be acceptable as satisfying these requirements.

The involvement and role of QA was evaluated to ensure that sufficient independence was established to verify that the ISFSI program was effectively developed, and implemented to support the safe operation of the ISFSI facility. The use of the condition

reporting program in support of ISFSI activities was also evaluated. The inspection consisted of field observations, interviews with licensee personnel, and review of licensee documentation.

The inspectors reviewed licensee self-assessments. The inspectors reviewed an Operational Readiness review conducted by the QA staff regarding ISFSI activities. The inspectors noted that the report was self-critical and identified various issues to be addressed in support of ISFSI operational readiness. The inspectors noted that audit findings were entered into the licensee's corrective action program (reference CR's 699950, 699951, and 699953) for resolution. The inspectors noted that the licensee had initiated an ongoing audit of ISFSI dry run activities in preparation of the initial fuel loading campaign, and that the audit team included individuals from other licensee nuclear plants with previous ISFSI experience (reference Fleet Audit Report: Fleet-ISFSI-2013). The inspectors noted that ISFSI-experienced personnel from other licensee nuclear plants were present in-the-field during initial cask loading activities.

The inspectors reviewed licensee's corrective action reports to verify that the licensee was adequately implementing its 10 CFR Part 50 corrective action program, as it pertained to the ISFSI program and related activities. The inspectors reviewed the corrective actions related to issues concerning ISFSI activities to verify that resolution was appropriate, the issue was properly documented, and that appropriate levels of management were notified. The inspectors noted that ISFSI-related issues were identified at a low safety threshold, and corrective actions implemented in a timely manner.

The inspectors noted that QA personnel attended the dry run briefings and were actively engaged in field activities, and verified that hold points, technical specifications, and work order requirements were implemented in accordance with approved procedures and related work documents.

The inspectors reviewed the QA program to determine whether the licensee had any material or equipment that required special handling or storage and, if so, that procedures and controls were in place to ensure adequate handling or storage of that material or equipment. The inspectors also walked down the storage area for the HI-STORM storage overpacks to verify that they were being adequately stored prior to use, and that there were no apparent structural indications, such as visible cracks, on their walls or damage to screen plates on the vents.

b. Findings

No findings were identified.

.1.7 Training and Qualifications

a. Inspection Scope (Inspection Procedure 60854)

The licensee's training program was reviewed to verify that appropriate training requirements were identified for ISFSI-related tasks, and that personnel were qualified to perform ISFSI-related activities. The licensee's training program was also reviewed to

verify that the required elements described in 10 CFR 72, Subpart I, Training and Certification of Personnel, and TS Section 5.7, Training Program, were incorporated into the ISFSI training program to ensure the safe handling and storage of spent nuclear fuel. The inspection consisted of a review of licensee documentation and interviews with cognizant personnel. The NRC inspectors confirmed that copies of the CoC and referenced documents were current.

The inspectors interviewed training personnel regarding the training and qualification of personnel performing ISFSI-related activities. Overview training was provided to personnel with ISFSI-related responsibilities. Several training modules were specifically developed for the ISFSI activities, including a general overview of the ISFSI project and job/task-specific modules that covered activities such as preparation and loading of the MPC, design and licensing basis, Licensing Part 72, and off normal conditions.

The inspectors noted that activities such as vacuum drying, helium backfilling, and welding of the MPC lids were to be performed by qualified contractors with previous experience in these task areas. Based on discussions with licensee personnel, the inspectors verified that the licensee had evaluated the training and qualification of contractor personnel to perform their intended functions.

The inspectors reviewed selected training modules and noted that they were comprehensive, and adequately covered training aspects of a given task. The inspectors noted that the licensee designated individuals qualified to perform a given task based upon successful completion of the required training modules.

Based on field observations and discussions with personnel during initial cask loading activities, the inspectors concluded that the individuals conducting ISFSI activities were properly trained and qualified to perform their assigned functions.

b. Findings

No findings were identified.

.1.8 Radiation Protection

a. Inspection Scope (Inspection Procedure 60854)

The licensee's radiation protection program was evaluated to verify that the elements of 10 CFR 72.126, Criteria for radiological protection, had been incorporated into procedures for ISFSI-related tasks and that they were effectively implemented by licensee personnel. Compliance with 10 CFR 72.104, Criteria for radioactive materials in effluents and direct radiation from an ISFSI or MPC, and 10 CFR 72.106, Controlled area of an ISFSI or MPC, was reviewed. The inspectors evaluated the effectiveness of the licensee's plans and preparations for controlling radiological activities by direct observation, by reviewing documents, and interviewing individuals with radiation protection responsibilities.

The inspectors reviewed the licensee's radiation protection program, including documents associated with the operating procedures of the ISFSI, the radiation

protection program of the loading campaign, and radiation protection program for the controlled area boundary of the ISFSI.

The inspectors reviewed the As Low As is Reasonably Achievable (ALARA) work plan and dose estimate for loading the first Holtec MPC. Based on discussions with licensee personnel and a review of documentation, the inspector determined that an appropriate dose goal had been established for the first Holtec cask loading. The inspector noted that the dose estimate for the initial cask loading was in reasonable agreement with estimated dose values noted in the Holtec FSAR. The ALARA work plan adequately addressed the use of temporary shielding at key steps of the evolution, and adequate contamination control and dose reduction measures, were incorporated into the ALARA work plan. The inspector noted that applicable procedures specified the need to perform radiological surveys at critical steps of the loading sequence, and when handling and transporting the loaded canister. Verification steps were incorporated into approved procedures to verify that dose rates and contamination levels were in compliance with applicable limits specified by the TSs.

b. Findings

No findings were identified.

.1.9 Control of Heavy Loads

a. Inspection Scope (Inspection Procedure 60854)

The NRC inspectors reviewed the licensee's implementation of the control of heavy loads program for ISFSI operations, including procedures and inspection, testing, and maintenance documentation associated with the crane, hooks, wire rope, cask lift yoke, cask lift beam, and cask grunions, etc. The inspectors also reviewed the responsibilities for employees, vendors, and contractors who participate in the lifting process, including personnel training and planning of lifts.

The licensee had installed a new single-failure proof Spent Fuel Cask Bridge Crane, certified and documented by the manufacturer to conform to the requirements of NUREG-0612 and NUREG-0554. The licensee conducted extensive reviews and functional tests to verify compliance with the NUREG requirements.

The NRC inspectors reviewed selected crane design features for compliance to the NUREG requirements, and determined that for those features reviewed, the crane met the single-failure proof criteria established by the NRC. The inspectors noted that crane, hook, and wire rope had been load tested and operated in accordance with the American Society of Mechanical Engineers (ASME) Code, NUREG-0554, and NUREG-0612.

The inspectors reviewed work orders associated with the loading and functional testing of special lifting devices used for ISFSI activities and determined that the crane, hooks, and wire rope were inspected, tested, and maintained in accordance with the ASME Code, NUREG-0554, NUREG-0612, and the crane manufacturer's recommendations.

The inspectors observed the licensee perform movements of heavy loads inside of the fuel handling and auxiliary buildings, and noted good supervisory oversight and good radiological protection practices.

b. Findings

No findings were identified.

4OA6 Meetings

.1 Exit Meeting Summary

The preliminary results of the inspection were discussed at an exit meeting conducted on October 25, 2013, with Mr. Tom Tynan, Vogtle Site Vice President, and other members of the staff.

ATTACHMENT: Supplementary Information

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
R. Brigdon, Emergency Preparedness Manager
J. Cash, Project Lead for Dry Storage (Corporate)
R. Collins, Chemistry Manager
T. Cucci, ISFSI Project Manager
R. Barringer, Security Manager
G. Gunn, Licensing Supervisor
M. Johnson, Health Physics Manger
R. Loftin, Reactor Engineering Supervisor
K. Morrow, Licensing Engineer
J. Ponder, Senior Dry Cask Storage Engineer (Corporate)
T. Roomy, System Engineer
D. Sutton, Site Projects Manager
J. Tupik, Work Management Manager
T. Tynan, Vogtle Site Vice President
K. Walden, Licensing Engineer
S. Waldrup, Regulatory Affairs Manager
A. Wesley, Site Project Lead

Holtec, International
E. Baker, Holtec Project Lead

NRC
M. Cain – Vogtle Senior Resident Inspector
T. Chandler, – Vogtle Resident Inspector

LIST OF REPORT ITEMS

Opened and Closed

None.

DOCUMENTS REVIEWED

Procedures
27315-C, Spent Fuel Cask Crane Monthly, Quarterly and Annual Checkout, Version 28
93641-C, Development and Implementation of the Fuel Shuffle Sequence Plan, Version, 21.1
93662-C, Spent Fuel Pool Inventory and ICA Maps, Revision 11
93665-C, Dry Cask Loading July XX, 2008, Version 1.1
93700-C, Used Fuel Loading And Unloading Outage Guidelines, Version 1.0
93701-C, HI-STORM, MPC, and HI-TRAC Storage and Pre-Use Inspections, Version 1.0
93702-C, DFS Ancillary Equipment Lay Up and Pre-Use Preparations, Version 1.0

93703-C, MPC Off-Loading and Upending, Version 1.0
93704-C, MPC Receipt Inspection, Version 1.0
93705-C, HI-STORM Receipt Inspection, Version 1.0
93706-C, HI-STORM In-Service Annual Inspection and Maintenance, Version 1.0
93707-C, HI-TRAC Annual Inspection and Maintenance, Version 1.0
93708-C, DFS Rigging Plan, Version 1.0
93711-C, HI-STORM System Site Transport, Version 1.0
93713-C, MPC Fuel Loading Operations, Version 2.0
93714-C, MPC Closure Operations, Version 1.0
93717-C, Alternate Cooling Water System Operation, Version 2.1
93719-C, Vertical Cask Transporter Operation and Maintenance, Version 1.0
93720-C, MPC Closure Welding and NDE/Inspections, Version 1.0 Draft
93722-C, Forced Helium Dehydration System Operation, Version 1.0
93723-C, Supplemental Cooling System Operation, Version 1.0
93730-C, MPC Helium Leak Test, Version 1.0 Draft
93734-C, MPC Inert Gas Purge and Hydrogen Monitoring, Version 1.0 Draft
93741-C, DFS Equipment Malfunction Guidance, Version 1.0
93742-C, HI-STORM System Unloading Operations, Version 1.0
93750-C, Visual Weld Inspection for HOLTEC MPC, Version 1.0 Draft
93760-C, MPC Integrity – Loading, Version 1.0
93761-C, MPC Integrity – Unloading, Version 1.0
93762-C, Supplemental Cooling System Operability, Version 1.0
93763-C, Inspection and Testing of Dry Storage Lifting Devices, Version 1.0
93764-C, Inspection and Testing of 125-Ton Lift Yoke, Version 1.0
93765-C, Chemistry Sampling of the MPC, Version 1.0
93780-C, HI-TRAC Contamination Survey, Version 1.0
93781-C, HI-TRAC Surface Dose Rates, Version 1.0
93782-C, HI-STORM Surface Dose Rates, Version 1.0
ES-ESDCS-003, Dry Storage Document Retention, Version 2.0
NF-212, Selection of Vogtle Fuel Assemblies for Use in HI-STORM Dry Cask Storage Systems, Southern Nuclear Operating Company, Version 1.1
NF-212-F10, MPC-32 Loading Plan, Version 1.0
Nuclear Management Procedure (NMP)-ES-059, Dry Storage Operation, Version 2.0
NMP-MA-007, SNC Rigging and Lifting Program, Version 6.0
NMP-MA-007-001, SNC Rigging and Lifting Program Planning and Evaluation, Version 9.0
NMP-MA-007-002, SNC Rigging and Lifting Program Rigging Materials General Usage, Version 9.2
NMP-MA-007-003, SNC Rigging and Lifting Program Rigging Hardware Inspection, Version 6.1
NMP-MA-007-004, SNC Rigging and Lifting Program Mobile Cranes, Version 12.0
NMP-MA-007-005, SNC Rigging and Lifting Program Cranes, Version 6.0
NMP-MA-007-006, SNC Rigging and Lifting Program Personnel Qualifications, Version 4.1
NMP-MA-007-007, SNC Rigging and Lifting Program Personnel Lifting Devices, Version 5.0
NMP-MA-007-008, SNC Rigging and Lifting Program Materials Procurement Requirements, Version 4.0
NMP-MA-007-011, SNC Rigging and Lifting Program Plant A. W. Vogtle Specifics, Version 8.1
NMP-RE-003, The Use and Administration of TracWorks and its Database, Version 3.0
NMP-TR-425, Fire Drill Program, Version 5.3

Calculations

AX4AL03A-00020, Vendor Calculation Design Input Records for Spent Fuel Cask Bridge Crane, Version 2.0
AX4AL03A-00024 (REP-21129-002), NUREG 0554 and NUREG 0612 Compliance and Safety Analysis Report for Spent Fuel Cask Bridge Crane, Revision 2.0
AX4AL03A-00025 (REP-21129-004), Existing Design Basis and Specifications Compliance Document for Spent Fuel Cask Bridge Crane, Revision 3.0
AX4DE501, Spent Fuel Cask Bridge Crane Clearance and Hook Travel Envelope, Revision 0
Calculation MC-V-12-0158, (Modification Calculation to X6CHH.20), "Evaluation of Onsite Gasoline and Diesel Fuel Storage Tanks," Version 1
HI-2115042, Non-Mechanistic Tipover of the HI-STORM 100S Version B at Vogtle Nuclear Power Plant, Revision 2
X2CA64, ISFSI Cask Haul Route – Evaluation of Buried Utilities – Outside PA, Version 4.0
X2CA65, ISFSI Cask Haul Route – Evaluation of Buried Utilities – Inside PA, Version 6.0
X2CA75, Underground Utilities Evaluation Under ISFSI Small Pad Vogtle Units I & 2, Version 4.0

Corrective Action Documents

Condition Report 655266, Notable Damage to Two Trunnions Used for Lifting the Dry Cask Storage Containers
CR 657027, Notable Damage to Two Trunnions Used for Lifting the Dry Cask Storage Containers
CR 705631, Trunnion Has Damage on Load Bearing Surface.
CR 705666, Trunnion Has Damage on Load Bearing Surface.
CR 706924, Trunnion Has Damage on Load Bearing Surface.
CR 707675, Trunnion Has Damage on Load Bearing Surface.
Design Change Package (DCP) 1102491801, Penetration through Auxiliary Building Roof, Version 1.0
DCP C100867501 (SNC142942), ISFSI Small Pad Inside the PA, Version 2.0
DCP C100867701, Auxiliary/Fuel Handling Building Design Interface Analysis and Modifications, Version 4.0
DCP C100867901 (SNC142990), PA Security Fence and Sally Port Modification, Version 5.0
DCP C100868001, ISFSI Haul Road Inside Protected Area, Version 3.0
DCP C100868101 ISFSI Heavy Haul Road Outside Protected Area, Version 4.0
DCP SNC142974, Spent Fuel Cask Bridge Crane Replacement, Version 2.0
Nuclear Oversight Assessment Report V-NOSA-OTH-2013-003, Dry Cask Storage Operational Readiness
Vogtle Vulnerability Review-ISFSI - FLEET-ISFSI-2013

Other Documents Reviewed

AX4AL03A-00034, Crane Bridge and Trolley Uplift Evaluation, Version 1.0
AX4AL03A-00040, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 1A of 6, Version 1.0
AX4AL03A-00041, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 1B of 6, Version 1.0
AX4AL03A-00042, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 2A of 6, Version 1.0

AX4AL03A-00043, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 2B of 6, Version 1.0
AX4AL03A-00044, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 3 of 6, Version 1.0
AX4AL03A-00045, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 4 of 6, Version 1.0
AX4AL03A-00046, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 5A of 6, Version 1.0
AX4AL03A-00047, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 5B of 6, Version 1.0
AX4AL03A-00048, Spent Fuel Cask Bridge Crane 125/15 Ton Top Running SFP Trolley Spent Fuel Cask Bridge Crane Operation, Parts & Maintenance Manual Volume 6 of 6, Version 1.0
AX4AZ11-00003, Structural Analysis of Cask Transfer Facility at Vogtle, Version 2.0
AX4AZ11-00108, Dose Rates Calculation for ISFSI Fences and Security Post, Version 1.0
AX4AZ11-00012, HI-STORM CoC Radiation Protection Program Dose Rate, Version 2.0
AX4AZ11-00013, Dose Versus Distance from HI-STORM 100S Version B Containing MPC-32 for Vogtle, Version 2.0
AX4AZ11-00097, Bounding Cask Handling Weights and Dimensions for Holtec HI-STORM 100 Cask System at Vogtle, Version 1.0
Certificate of Compliance (CoC) 12219-001 for the Multi-Purpose Rigging System, Revision 0
CoC 12293-008 for the MPC Lid Lift Sling, Revision 0
CoC 13140-002 for Lift Bracket Slings, Revision 0
CoC 13156-001 for Downloader Slings, Revision 0
Component Completion Record (CCR) for HI-STORM 100S Serial Number 566
CCR for HI-STORM 100S Serial Number 573
CCR for HI-STORM 100S Serial Number 575
CCR for HI-STORM 100S Serial Number 576
CCR for HI-STORM 100S Serial Number 725
CCR for HI-STORM 100S Serial Number 726
CCR for HI-STORM 100S Serial Number 727
CCR for HI-STORM 100S Serial Number 728
Corporate TE 685117 (LDCR 2013043), Initial Issue of the Vogtle Plant 10 CFR 72.212 Report, Version 1.0
Documentation of Engineering Judgment DOEJ-VDC100867501-M001, “Fire Hazards Analysis for Vertical Cask Transporter – Vogtle Independent Spent Fuel Storage Installation (ISFSI),” Version 1
Documentation of Engineering Judgment DOEJ-VDC100867501-M002, “Fire Hazards Analysis for Spatial Separation Requirements for VEGP Units 1 & 2 Independent Spent Fuel Storage Installation (ISFSI),” Version 1
VEGP Design Criteria (DC)-1213, Spent Fuel Cooling and Purification System, Version 7
DC 2007, Radiation Shielding, Version 8
DC 2209-A, Independent Spent Fuel Storage and Transport System-Mechanical, Version 1
DC-2209-B, Independent Spent Fuel Storage & Transport System – Civil, Version 1
DC 2423, Spent Fuel Cask Decontamination System, Version 3

Holtec Procedure HSP-504, Procedure to Perform Closure Welds on the MPC and MPC Lid, Revision 22
Holtec Procedure HSP-505, Control and Issuance of Weld Filler Metal for MPC Site Welding Services, Revision 5
Holtec Procedure HSP-506, Liquid Penetrant Examination for MPC Field Closure Welding, Revision 8
Holtec Procedure HSP-507, Visual Weld Examination for Field Closure Welding, Revision 6
Holtec Procedure HSP-508, Repair of Deposited Weld Metal for MPC Field Closure Welding, Revision 2
Holtec Weld Procedure Specification WPS 47LW, Manual GTAW on MPC Closure Welds, Revision 0
Holtec Weld Procedure Specification WPS 246LW, Machine GTAW – Hot Wire on MPC Closure Welds, Revision 3
NDE Records, including Personnel Certification of NDE Technicians, Visual Inspection Report Log and Liquid Penetrant Report Log for welds of MPC #0212
Personnel Qualification Records of Holtec welders of the MPC
Vogtle Response to Generic Letter 85-11, Completion of Phase II of "Control of Heavy Loads at Nuclear Power Plants"
VTE438151, Vogtle Electric Generating Plant Emergency Plan, Version 60
Work Order (WO) 450894, ACECO Cask Bridge Crane Annual Inspection
WO SNC370407, Cask Crane Load Test
WO SNC467108, HI-TRAC Annual Inspection and Maintenance
WO SNC475208, Inspection and Testing of Dry Cask Storage Lifting Devices
WO520449, Perform Friction Test for ISFSI Small Storage Pads
WO 142989, Cask Crane Functional Test

LIST OF ACRONYMS

ALARA	As Low As is Reasonably Achievable
ASME	American Society of Mechanical Engineers
CoC	Certificate of Compliance
CTF	Cask Transfer Facility
CWA	Cask Washdown Area
EALs	Emergency Action Levels
FSAR	Final Safety Analysis Report
ISFSI	Independent Spent Fuel Storage Installation
LPT	Low Profile Transporter
MPC	Multi-Purpose Canister
QA	Quality Assurance
SAR	Safety Analysis Report
SER	Safety Evaluation Report
SFP	Spent Fuel Pool
SNC	Southern Nuclear Operating Company, Inc.
SNM	Special Nuclear Material
SSC	System, Structure, or Component
TS	Technical Specifications
VCT	Vertical Cask Transport
VEGP	Vogtle Electric Generating Plant