UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

January 21, 2005

Duke Energy Corporation
ATTN: Mr. G. R. Peterson
Vice President
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION - INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) DRY RUN NRC INSPECTION REPORT 07200038/2004003, 05000369/2004009, and 05000370/2004009

Dear Mr. Peterson:

On December 22, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station Independent Spent Fuel Storage Installation (ISFSI). The enclosed inspection report documents the inspection findings, which were discussed on December 3, 2004, and on January 6, 2005, with Mr. Tom Harrall and other members of your staff.

The inspection examined activities conducted under your (ISFSI) license as they relate to safety and compliance with the Commission's rules and regulations. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

These inspections included observation of activities associated with your pre-operational testing program and the loading of your first ISFSI cask. The inspections were conducted to confirm compliance of your program and activities with the requirements specified in the license, Technical Specifications, Final Safety Analysis Report and the NRC's Safety Evaluation Report for the NAC-UMS cask system. The enclosed report presents the results of this inspection. Overall, the inspection found that activities were being performed in accordance with procedural and regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

If you have any questions concerning this inspection, please contact Mr. Binoy Desai, Senior Project Engineer, at (404) 562-4519 or the undersigned at (404) 562-4510.

Sincerely,

/RA/

Kerry D. Landis, Chief
Reactor Projects Branch 5

Docket Nos.: 07200038, 05000369, and 05000370

Enclosure: NRC Inspection Report 07200038/2004-003, 05000369 and 370/2004-009 w/Attachment - Supplemental Information

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E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
PUBLIC DOCUMENT	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	07200038, 05000369, and 05000370
Report No:	07200038/2004003, 05000369/2004009, and 05000370/2004009
Licensee:	Duke Energy Corporation
Facility:	MCGUIRE NUCLEAR STATION - INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)
Location:	12700 Hagers Ferry Road Huntersville, NC 28078
Dates:	November 29 - December 22, 2004
Inspectors:	B. Desai, Senior Project Engineer, Region II (Team Leader) J. Pearson, Safety Inspector HQ/SFPO A. Barto, Technical Specialist, HQ/SFPO A. Vargas, Reactor Engineer, Region II J. Rivera, Reactor Engineer, Region II S. Walker, Resident Inspector, Region II J. Brady, Senior Resident Inspector, Region II
Approved by:	K. Landis, Chief, Reactor Projects Branch 5 Division of Reactor Projects, Region II

SUMMARY OF FINDINGS

MCGUIRE NUCLEAR STATION - INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

NRC Inspection Report 07200038/2004001 and 05000369,370/2004009

The McGuire Nuclear Station developed and implemented a dry cask storage program to remove spent fuel from the reactor spent fuel pool for storage at the McGuire Independent Spent Fuel Storage Installation (ISFSI). The ISFSI is located within the current reactor site exclusion area.

The licensee has utilized the Transnuclear (TN) cask design and plans to utilize the NAC-UMS cask system for future spent fuel storage needs. The NAC-UMS system consists of a stainless steel canister in which the spent fuel is placed. This transportable storage canister (TSC) is welded shut and placed in a vertical concrete cask (VCC) that is moved to the ISFSI pad. All handling and movement of the TSC prior to insertion into the concrete cask is performed with the canister inside the transfer cask (TRC). The TRC provides the necessary shielding of the TSC to allow workers to perform duties near the TSC which include welding, vacuum drying, backfilling with helium, as well as performing the necessary tests on the welds to ensure quality of the weld.

The NRC conducted onsite inspections of the activities associated with the licensee's NAC-UMS cask storage program. The NRC observed licensee activities including loading, drying, helium backfilling and welding activities of the first cask. NRC Inspectors were also present for the heavy lift of the loaded TSC, movement of the canister, and the lowering of the canister into the concrete cask. The NRC inspections focused on the licensee's efforts to demonstrate that adequate equipment, procedures, and personnel were in-place to safely move spent fuel from the reactor spent fuel pool to the ISFSI pad. The pre-operational test requirements covered key activities related to loading a cask and moving the cask to the ISFSI pad. Throughout the demonstrations observed by the NRC, the McGuire staff functioned professionally and performed their assigned functions safely.

NRC made several observations during the licensee dry run demonstrations. These observations were captured by the licensee in the corrective action program document Problem Identification Process Report (PIPs).

Report Details

1. Dry Run Observations

a. Inspection Scope (60854)

The inspectors observed licensee dry run demonstrations for the NAC International Universal MPC System (NAC-UMS) Independent Spent Fuel Storage Installation (ISFSI) system at the McGuire Nuclear Station from November 29, 2004 through December 3, 2004. The dry run activities were intended to demonstrate licensee (McGuire) readiness in their capability to safely load, seal, transfer, and store spent fuel in the ISFSI system. During the course of the inspection, the inspectors verified and/or observed the following attributes to assess licensee performance relating to dry cask storage activities:

- Licensee's pre-operational test program to determine if the licensee is capable of safely using the NAC-UMS system. The pre-operational test program is intended to ensure that the conditions and requirements of the Certificate of Compliance (CoC) are being met and that the licensee is capable of safely loading spent fuel into the ISFSI and transferring spent fuel back to the spent fuel pool (SFP) from the ISFSI pad.

- The licensee had completed an evaluation to verify compliance with the conditions of the NAC-UMS system design, Final Safety Analysis Report (FSAR), and requirements in 10 CFR Part 72.

- The licensee had established a safe loads path for cask movement.

- Licensee dry run demonstrations involving unloading of the Transportable Storage Cannister and the Transfer Cask (TSC/TSF) assembly into SFP deep end, crane lifting tools change, TSC top shield lid movement, uploading of TSC/TSF assembly from the deep end to the SPF shelf, installation of concrete shielding plate on top of the TSC, and transportation of the dry cask from the SFP building to the ISFSI pad were conducted in accordance with procedures and provided adequate practice as well as realistic simulation of actual loading.

- The licensee had incorporated into procedures the correct requirements for helium backfill of the canister after drying. The acceptable leak rates for passing the test were consistent with the requirements in the Technical Specifications (TS). Personnel assigned to perform the leak tests were qualified to the appropriate leak test certification requirements.

- Vacuum drying time limits and acceptance criteria had been incorporated into procedures.

- Strong radiological controls had been established to support cask activities.

- The licensee's records program had incorporated the various requirements for creating and maintaining ISFSI records.

- The training program for personnel assigned to the ISFSI provided a good basis for understanding the requirements and safe practices associated with dry cask loading operations.

b. Observations and Findings

The inspectors reviewed licensee procedures and observed the implementation of the procedures which tested the site's capability to safely load spent fuel from the SFP into the TSC and transfer the loaded canister to the ISFSI pad. The procedures were well developed and complete. The licensee held pre-job briefings prior to each segment of the procedure. These pre-job meetings were conducted such that necessary items to enhance safety (such as the need for three way communication, pre-staging of equipment, specific assignment of job functions by name and reinforcement of team work among work parties) were discussed. The briefs included reviews, select portions of procedures and discussion for particular contingencies during loading activities.

Inspectors observed crane operation to ensure that heavy loads could be safely lifted and transferred. Lifts of the empty transfer cask and the TSC and the Vertical Concrete Cask (VCC) combined were witnessed. The inspectors observed good communication and team work between departments.

The inspectors reviewed licensee procedures and observed the implementation of the procedures related to the TSC movement, fuel loading, draining, vacuum drying, helium backfill, and helium leakage rate testing operations. Inspectors witnessed the draining operation, as described in Section 11.11 of Duke Power Company Procedure No. MP/0/A/7650/212, Loading Spent Fuel Assemblies Into NAC-UMS Casks. The NAC-UMS transfer cask was lifted by one upper trunnion in order to tilt the cask to a 5° angle, to allow for the draining of additional water that is typically entrained on the horizontal surfaces of the TSC basket, thereby decreasing the amount of time necessary to drain the canister. Although the licensee stated that the TSC had been drained in as little as 1.5 hours during previous dry-runs, the draining operation associated with this dry-run took approximately 4.5 hours, due to pump performance problems.

The inspectors also observed portions of the operations related to vacuum drying, helium backfill, and helium leakage rate testing of the drained TSC. The licensee performed portions of Sections 11.12, 11.13, and 11.15 of the MP/0/A/7650/212. The licensee demonstrated all the hose and valve attachments, as well as placement of the helium leakage rate test fixture and the attachment of the calibrated leak, that would be necessary to perform the procedures. The procedure steps involving actual pump operation, helium introduction, and operation of the helium mass spectrometer were not performed due to the fact that the TSC used for the dry-run did not include a welded shield lid. Welding of the shield lid was demonstrated for the NRC at an earlier date, so

the shield lid for this dry-run was placed as it would be prior to welding, but not actually welded.

Inspectors held discussions with McGuire personnel regarding the vacuum drying, helium backfill, and helium leakage rate testing procedures. The licensee stated that involved McGuire personnel have relevant training and experience performing similar draining, drying, backfilling, and leakage rate testing procedures on a similar cask system. These same personnel will be involved in loading the NAC-UMS cask system at McGuire.

The inspector reviewed select portions of Calculation MCC 1139.01-00-0174, Truck Cask Drop Analysis. This calculation also addressed some crane failure scenarios and has been updated to include analysis for the NAC-UMS casks.

The licensee was prompt in initiating corrective action documents for areas requiring improvement during the dry run activities. The inspectors discussed with Regulatory Compliance, Fuel Engineering, and Reactor System Engineering personnel the process required for lid removal and cask unloading should it become necessary. McGuire personnel indicated during the discussion that they considered some of these processes and had reviewed a draft rental agreement between NAC International, Inc. and another utility to help them understand how McGuire could procure adequate equipment and services for instances where cask lid removal would be necessary. McGuire personnel discussed the possible use of the necessary lid cutting equipment which was currently stored at the Maine Yankee site. The discussion included a verbal description of how the security inspection process would occur at McGuire. In addition, the discussion included a description of the radiological inspection process that would occur at the point of receipt at McGuire. The procedures for these activities were reviewed. The inspectors noted that this draft rental agreement only covered the lid cutting equipment, and not the operating personnel. The inspector noted the draft agreement specifically stated that the cutting equipment required operation by trained personnel because of specialization. The inspector questioned McGuire personnel about training their own personnel or procuring qualified operator for the equipment. The licensee instituted corrective action document (PIP) to address this issue.

Additionally, during the inspection, the following PIPs were issued for corrective action at McGuire as a result of inspector questions:

PIP M-04-05629
"During the NRC observed NAC-UMS cask loading dry run exercise, one of the NRC inspectors observed some vertically oriented indications on the Unit 2 125 ton Fuel Building Crane bridge girders. While these indications do not appear to be a concern, they need to be evaluated to ensure a structural problem with the girders does not exist."

PIP M-04-05624
"During the NRC Inspection of the ISFSI dry run exercise for loading/unloading NAC-UMS spent fuel casks, one of the inspectors raised concerns regarding contingency

planning for problems that could occur during cask loading activities. In particular the inspector questioned what McGuire would do if the crane was rendered unusable at a time when conditions required that the cask be submerged under water (e.g. when "Time to Boil" or cask drying times can not be met). Engineering and Maintenance Technical Support personnel have already begun discussing this issue and begun determining vulnerabilities and possible contingency actions. The purpose of this PIP is to provide a means for Engineering to further investigate this issue and determine the appropriate vehicle for documenting conclusions and associated contingencies."

PIP M-04-05626
"During the NRC observed NAC-UMS cask loading dry run exercise, the cask transporter had to travel across extremely soft soil to access the ISFSI pads. This condition should be evaluated to determine if compacting or some other repair method is needed to stabilize the soil."

PIP M-04-05628
"During the NRC observed NAC-UMS cask loading dry run exercise, the "A" RTD was reading greater than 1500 degrees when the temperature monitoring system was activated for cask 0FCTKN004 at the ISFSI site. Earlier in the day, one of the RTD's was brushed during removal of the VCC platform in preparation for moving the cask out of the Unit 2 Fuel Building. The RTD needs to be repaired, and the platform may require some modification to provide more clearance".

PIP M-04-05730
"During the NRC inspection of the NAC-UMS dry run, an inspector questioned the ability to remove a lid from a welded transportable storage canister (TSC) should the need arise. He recommended developing a road map to use if the lids needed to be removed. TS A 5.2 describes the required preoperational testing and training exercises before storing fuel in the NAC-UMS system. Specifically, 5.2.m lists "canister unloading including reflooding and weld removal or cutting section". From discussions with other NAC users, a weld removal demonstration had been successfully performed in May 2002 at Yankee Rowe. This demonstration was documented by NAC and Yankee. This demonstration was used by Maine Yankee to meet the requirements of TS A 5.2.m. Various internal memos from Maine Yankee were provided and reviewed to determine that this demonstration was adequate to show the ability to remove the lids from a welded TSC. Furthermore, the NRC dry run at Palo Verde in November 2002, and March 2003, set a precedent of using the weld removal demonstration from another utility to "demonstrate" the capability to remove the lids in meeting TS A 5.2.m. NAC submitted a proposal for lid removal equipment and services on July 29, 2003 in NAC letter PROJ20030240. The proposal included a video of the demonstration at Yankee Rowe, operating procedures for the equipment, a demonstration report and a lease agreement for equipment and services. Based on the precedent set by Yankee Rowe, it was decided not to go forward with the actual proposal, but to use this proposal to demonstrate the capability for McGuire to remove the lids based on the successful demonstration at Yankee Rowe and the ability to have the same service performed at McGuire if needed through the execution of this proposal.

PIP M-04-05627
"Access to ISFSI Pads may not be acceptable for unloading a cask".

In conclusion, based on direct observation of activities and review of the various procedures, the inspectors determined that the licensee was capable of safely loading spent fuel from the SFP into the TSC, and performing the steps necessary to close the TSC, including draining, vacuum drying, helium backfill, and helium leakage rate testing. Furthermore, the licensee was capable of transporting the storage cask to the ISFSI. Procedures and administrative controls have been established to ensure compliance with CoC requirements. The inspectors also determined that the licensee was capable of re-transferring retrieving spent fuel from the ISFSI to the SFP.

2. Part 72.212 (b) Requirements (IP 60856)

a. Inspection Scope

The inspectors assessed if the McGuire Nuclear Station had performed an acceptable evaluation to determine compliance with 10 CFR Part 72.212(b) requirements in regard to the NAC-UMS cask system.

b. Observations and Findings

The inspectors verified the preparation of select sections of the 10 CFR Part 72.212 evaluation which was dated November 19, 2004. The sampled portions of the Part 72.212 evaluation were reviewed to determine if the conditions set forth in the Part 72-0038 CoC for the NAC-UMS cask system had been met. The review determined that the Part 72.212 evaluation prepared by the licensee was in compliance with 10 CFR Part 72.212 (b) requirements.

The inspectors reviewed a sample of procedures which governed the loading and unloading activities and also verified the existence and control of each of the procedures in the McGuire document control system. The inspector also verified accessability and reviewed the contents of the cask supplier records showing spent fuel previously stored per MEI-0400-138, McGuire Nuclear Station Dry Storage Cask 2-7(7). Though the inspector reviewed documents for a TransNuclear (TN) cask, the inspector was able to determine the process to be used for the NAC-UMS cask documentation as required by 10 CFR 212 (b)(8)(I). The package reviewed covered loading information in regard to cask serial number TN-32A-56 and included enclosure pages for all loaded assemblies under procedure XSFM-004, Dry Storage Certification as well as enclosure 4.5 from procedure OP/0/A/6550/027, TN-32A DSC Storage Array Orientation Schematic. The inspector verified that McGuire Nuclear Station was maintaining a controlled copy of the NAC in the document processing center (DPC). The inspector verified that a hard copy was available in the vault.

The inspector verified that the items required to be classified as QA Condition 1 items for procurement and maintenance activities, in regard to the NAC-UMS, were being appropriately identified and tracked through the McGuire equipment database.

The inspector verified through a review of a list of currently trained personnel and discussion with McGuire training personnel that the implemented training program included specific procedure training as well as demonstrations and actual performance activities. The records reviewed for loading and unloading personnel were compared to a listing of personnel performing activities during the dry run inspection. The inspector also noted many newer personnel were in the process of completing their required qualifications.

In summary, the review performed by the inspectors indicated that the licensee had performed adequate written evaluations to establish that the conditions of the C of C have been met. No findings of significance were identified however, 2 specific paragraphs were recommended for rewording for clarity on the part of the licensee.

3. Fuel Selection for Storage

a. Inspection Scope

The inspectors discussed with Fuel Engineering personnel the procedures related to characterization of spent fuel in the McGuire SFP, selection of fuel to be stored in the NAC-UMS cask system, and the movement of fuel from the SFP to the TSC. The inspectors also reviewed licensee procedures relating to classification criteria for determining whether spent fuel was damaged or intact had been incorporated into procedures and was consistent with the criteria established by the NRC.

b. Observations and Findings

Section 11.7 of Duke Power Company Procedure No. MP/0/A/7650/212, Loading Spent Fuel Assemblies Into NAC-UMS Casks, discusses the general instructions for loading spent fuel assemblies into the TSC, and refers personnel to Procedure OP/0/A/6550/028, NAC UMS Fuel Assembly Loading/Unloading Procedure, for detailed loading instructions. These instructions include steps regarding identification and physical movement of fuel assemblies and components, and related operations such as boron sampling. Fuel Engineering personnel indicated that fuel to be loaded in the upcoming campaign will be less than the maximum TS enrichment level requiring dissolved boron in the canister. Inspectors also reviewed Procedure No. XSFM-006, Workplace Procedure for Selecting Spent Fuel for Use of NAC-UMS System at McGuire General Licence ISFSI. This procedure outlined the types of fuel and components stored at the McGuire SFP which the licensee intends to store in the NAC-UMS System. The McGuire SFP contains Westinghouse and B&W 17 x 17 fuel assemblies and associated components. Fuel Engineering personnel indicated that any fuel assembly discharged from a core known to have leaking assemblies, and not inspected previously to determine if it was the leaking assembly, are required to have full-faced video inspections per procedure PT/0/A/4550/035, Fuel Assembly Examination and Debris Removal. Fuel Engineering personnel also indicated that a number of the fuel assemblies stored at McGuire have potential problems with stress corrosion cracking of the interface between the assembly guide tubes and the top nozzle. These assemblies are subjected to top nozzle inspections, also outlined in procedure PT/0/A/4550/035, to

determine if the assembly can be handled by the top nozzle. If there are any indications of stress corrosion cracking of the guide tube interface, then the assembly must be handled with a special tool that engages the guide tubes themselves rather than the top nozzle. Based on review of licensee procedures related to fuel selection for storage as well as discussions with licensee personnel, no negative issues were identified.

4. 10 CFR 72.48 Requirements (IP 60857)

a. Inspection Scope

The inspectors reviewed several 10 CFR 72.48 screening evaluations to determine if McGuire Nuclear Station had performed acceptable 10 CFR 72.48 screening evaluations related to the design, construction, and operation of the NAC-UMS cask, storage pad, and related ancillary equipment.

b. Observations and Findings

Inspectors held discussions with McGuire's Regulatory Compliance personnel and reviewed a sample of licensee identified changes which were considered under the screening criteria related to 10 CFR 72.48, Changes, tests, and experiments. None of the changes reviewed by the inspectors were required to be evaluated under the conditions of 10 CFR 72.48, and licensee personnel indicated that none of the changes that were made related to the design, construction, and operation of the ISFSI required a full 10 CFR 72.48 evaluation.

The bulk of the 10 CFR 72.48 screening evaluations were performed as a result of having to develop new procedures covering the entire fuel loading and unloading operations; i.e., a new procedure is a change by definition, since there was no procedure in use prior to issuing the new procedure. Licensee personnel noted that an additional procedural 10 CFR 72.48 screening evaluation will be required for the governing fuel loading procedure, MP/0/A/7650/212, in order to modify it to allow for the loading of actual fuel assemblies, as opposed to the dummy fuel assemblies currently referenced by the procedure.

One other 10 CFR 72.48 screening evaluation reviewed by inspectors involved a calculation to determine if components to be stored with fuel assemblies in the NAC-UMS meet the burn-up and cooling time assumptions used in the vendor’s shielding calculation. Although the TS for the NAC-UMS system do not include limitations on component burn-up and cooling time, the licensee noted that many of the components stored in the McGuire SFP exceed the burn-up values assumed in the shielding calculations for the cask. Enclosure 5.2 to procedure XSFM-006 includes a determination of the component burn-up, and an adjustment to the required cooling time for the component in order for it to be within the bounds of the assumption used in the NAC-UMS shielding analysis.

The licensee performed one 10 CFR 50.59 screening involving ancillary equipment related to the NAC-UMS cask system which should have been performed under the

screening criteria for 10 CFR 72.48. The licensee reported that they had mechanical problems with the loaded cask transporter during an earlier dry-run. The transporter was redesigned to better accommodate the weight of the loaded cask, and a 10 CFR 50.59 screening evaluation was performed which showed that the change did not have to be evaluated under 10 CFR 50.59. This error is not considered safety significant since the transporter design is not described in the FSAR for the NAC-UMS system, and since the screening criteria for 10 CFR 50.59 and 10 CFR 72.48 are identical. Licensee personnel stated this error was likely a result of reactor personnel being unfamiliar with 10 CFR 72.48, and that they would revise their process for determining 10 CFR 72.48 and 10 CFR 50.59 applicability to prevent this error from happening with future changes, tests, or experiments related to the ISFSI. The following PIP was initiated by the licensee as a result of the error.

PIP M-04-5685
"A 50.59 screening was performed instead of using the 72.48 process for a modification screening."

The review performed by the inspectors indicated that the licensee had performed adequate 10 CFR 72.48 screening evaluations to ensure that changes, tests, and experiments related to the design, construction, and operation of the ISFSI do not require further analysis. The only negative finding was related to performing a 10 CFR 50.59 screening evaluation where a 10 CFR 72.48 screening evaluation was appropriate. As discussed above, this finding is not significant and the licensee agreed to make changes recommended by the inspectors in order to prevent similar errors in the future.

5. Welding Observations (60853)

a. Inspection Scope

The inspectors observed dry run welding on a full-scale mockup of the top of an NAC-UMS TSC in June 2004. The observations included review of design welding requirements, a review of the welding procedure and its qualification record, and a review of welder qualification records. The inspectors also reviewed material certification records for the canister, shield lid, structural lid, shim materials, and the fluxcore weldwire.

The inspectors witnessed the complete welding and liquid penetrant inspection of the shield lid-to-canister weld, and the root pass welding and liquid penetrant inspection of the structural lid-to-canister weld on the mockup. Activities witnessed also included visual inspection of cleanliness, fit-up dimensions, and tack welds for both lids. Materials, activities, and qualifications were inspected against the Class 1 requirements of the ASME Boiler and Pressure Vessel Code, Sections II and III, 1998 Edition with 2000 Addenda, as well as well as the FSAR requirements for the NAC-UMS, Docket No. 72-1015, and the design drawings.

b. Findings and Observations

No findings of significance were identified.

6. Initial Cask Loading and Storage Observation

a. Inspection Scope

The inspectors reviewed the documentation package for Cask NAC-UMS TSC-001 (Document Control NO MCEI 0400-146) created using procedure XSM-006, Workplace Procedure For Selecting Spent Fuel For Use Of NAC-UMS System at McGuire and Regulatory Guide 3.54, Spent Fuel Heat Generation to verify that the selected fuel assemblies and burnable poison inserts met the requirements for insertion in dry cask storage.

The inspectors observed portions of initial cask loading, drying, sealing, and moving per procedures OP/0/A/6550/028, NAC UMS Fuel Assembly Loading/Unloading Procedure; and MP/0/A/7650/212, Loading Spent Fuel Assemblies Into NAC-UMS Casks; to verify that actual activities were accomplished in accordance with the procedures.

b. Observations and Findings

Overall, the licensee established and maintained adequate oversight for the dry cask storage evolution. Technical Specifications requirements and acceptance criteria as outlined in the FSAR for the NAC-UMS casks were followed appropriately. The inspectors considered the licensee's vendor oversight to be sufficient. Radiation protection controls were adequately established and implemented to reduce area and personnel doses and contamination.

The licensee encountered issues during the welding of the TSC shield lid due to a welding machine malfunction. This problem was corrected prior to the safety analysis time acceptance criteria for welding being exceeded. Problems also arose during the vacuum drying process of the spent fuel storage cask. NAC-UMS technical specifications allows for 52 hours following fuel loading to vacuum dry the cask and complete the helium backfill pressure test to ensure absolute drying. The licensee could not successfully complete the helium pressure test within the established criteria, resulting in a TS required action of establishing in-pool cooling (IPC) for 24 hours for the cask. Following the 24 hour in-pool cooling, the licensee was able to pass the pressure test and proceed with the evolution.

7. Transnuclear 32 Issues

a. Inspection Scope

The inspectors walked down the pressure alarms and temperature indications at local control panels for the existing TN-32 and the planned NAC-UMS dry casks to determine

material condition, functionality, as well as operator familiarity. The inspectors also followed up an issue regarding water intrusion in various TN-32 overpressure control boxes through the helium tube penetration on the top of the overpressure control boxes.

b. Findings and Observations

The TN-32 overpressure control box contains the pressure switches which activate in case of lid seal leakage. After heavy rain events, the licensee has experienced low pressure alarm activations due to water intrusion through the helium tube penetration on the top of the control box. The licensee has made several attempts to solve this problem by sealing the tube penetration using standard RTV sealant and other methods. However, they are still experiencing low pressure alarms during heavy rain. The inspectors went to the ISFSI pad and directly observed the repair method used to seal the overpressure control box. The inspectors also interviewed ISFSI staff to review how the operators respond when a low pressure alarm occurs and what actions the licensee takes to solve the problem. The inspectors found that any low pressure alarm is treated as a valid alarm and that operations personnel respond according to the procedures. As a final solution, the licensee will issue a work order to remove the existing RTV sealant and seal the tube penetration with 3M Scotchcast 9 sealant and Duxseal. This repair method has been used for different applications and environmental conditions, and it is also approved on the McGuire chemical control list.

Meetings, Including Exit

A preliminary and final exit was held with the licensee on June 11 and August 11, 2004 respectively. The final exit was a phone exit.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

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N. Sims, Regulatory Compliance
P. Stiles, Welding Team Lead
J. William, Programmatic Manager
Terry Moore, Engineering
S. Lipe, Maintenance
T. Lee, Maintenance
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P. Guill, Engineering
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NRC

J. Brady, Senior Resident Inspector
S. Walker, Resident Inspector

INSPECTION PROCEDURES USED

60854	Preoperational Testing of an ISFSI
60855	Operations of an ISFSI
60856	Review of 10 CFR 72.212(b) Evaluations
60857	Review of 10 CFR 72.48 Evaluations
81001	ISFSI Security

ITEMS OPENED, CLOSED, AND DISCUSSED

None

List of Documents Reviewed

Drawing # 085, Transportable Storage Cannister, (TSC) Duke, NAC_UMS, Rev. 3

Drawing # 082, Shell Weldment Canister Duke-McGuire, NAC-UMS, Rev. 2

Drawing # 084, Details, Canister, Duke, NAC-UMS, Rev. 2

Procedure MP/O/A/7700/119, Cask - NAC-UMS Transportable Storage Canister Welding, Rev. 0

Work Order 98629593-05, Task 2FCSPMISC, Cask Welding Dry Run

GT000808-01, Welding Procedure Specification Mechanized GTAW, Rev. 2

L-104D Welding Procedure Qualification Record (PQR)

PIP M-03-00837: Cask OFCTKT006 Trouble Alarm would not clear"

PIP M-03-03047: ID1729 OAC Alarm due to RCS OFCEM0003F Communication Failure

PIP M-04-04457: Cask Trouble Alarm

XSFM-006, Workplace Procedure for Selecting Spent Fuel for Use of NAC-UMS System at McGuire General Licence ISFSI

PIP M-04-04501: Unplanned TSAIL Entry MO-0402081 on ISFSI Cask

M1D1729 Alarm: Automatic Actions and Response for TN-32 & NAC "ISFSI Area-Cask Trouble" Alarm

TS 3.1.6: NAC-UMS System, Concrete Cask Heat SR 3.1.6.1Removal

PT/1/A/4600/003 B, Rev. 089: Procedure, "Daily Surveillance Items for NAC-UMS Cask Monitoring"

TS 3.1.5: Cask Interseal Pressure SR 3.1.5.1 & 3.1.5.2

PT/1/A/4600/003 C, Rev 56: Procedure, "Weekly Surveillance Items for TN-32"

TT-0-A-9100-497, Rev. 004, NAC-UMS Spent Fuel Cask Dry Run Procedure"

Work Order: 98338752, Inspect Casks #1 through #10, Perform Visual Inspection of each Cask, Inspect Casks Coatings"

Work Order: 98674510 , Perform Visual Inspection of Concrete Surfaces "Inspect all Accessible Metal Surfaces for Corrosion" Regrout Concrete Surface Defects, "Repaint Metal Surfaces where Corrosion was Identified"

PT-0-B-4550-038, TN-32A Dry Cask Pressure Switch Channel Operational Test

HP/0/1004/001, Receipt and Opening of Radioactive Material Packages and Receipt of Vehicle for Shipment of Radioactive Waste

MP/0/A/7650/188, Operation of Dry Cask Transporter

MP/0/A/7650/211, Unloading Spent Fuel Assemblies from NAC-UMS Casks

MP/0/A/7650/212, Loading Spent Fuel Assemblies into NAC-UMS Casks

MP/0/A/7650/119, Cask- NAC-UMS Transportable Storage Canister Welding

OP/0/A/6550/028, NAC-UMS Fuel Assembly Loading Unloading Procedure

PT/0/A/4550/035, Fuel Examination and Debris Removal

SP/0/1302-M, Protected Area Search and Entry/ Exit Process