March 27, 2003

Mr. Kurt M. Haas
General Manager
Big Rock Point Nuclear Plant
Consumers Energy Company
10269 US 31 North
Charlevoix, MI 49720

SUBJECT: BIG ROCK POINT INSPECTION REPORT 07200043/2003-001(DNMS)

Dear Mr. Haas:

On March 6, 2003, the NRC completed an inspection at the Big Rock Point Nuclear Plant Restoration Project. The purpose of the inspection was to determine whether dry cask loading activities were conducted safely and in accordance with NRC requirements. Specifically, the focus of the inspection related to the loading of five dry fuel storage casks, numbers three through seven, and their transfer to the Independent Spent Fuel Storage Installation. At the conclusion of the inspection on March 6, 2003, the NRC inspectors discussed the findings with members of your staff.

This inspection consisted of an examination of dry cask loading activities at the Big Rock Point Nuclear Plant Big Rock Point Nuclear Plant as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel. The enclosed report presents the inspection findings, which were discussed on March 6, 2003, with members of your staff.

Based on the results of this inspection, the NRC did not identify any violations, and, although there were some unexpected abnormalities that occurred during the loading of the five casks, the cask team was able to resolve them successfully. Some problems with cask lid quality from the manufacturer were indicative of the need for additional oversight of the manufacturer quality control process. No violations of NRC requirements were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

/RA/

Christopher G. Miller
Decommissioning Branch

Docket No. 07200043

Enclosure: Inspection Report 07200043/2003-001(DNMS)

cc w/encl: R. A. Fenech, Senior Vice President,
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.	07200043
Report No.	07200043/2003-001(DNMS)
Licensee:	Consumers Energy Company
Facility:	Big Rock Point Nuclear Plant
Location:	10269 U.S. 31 North Charlevoix, MI 49720
Dates:	February 2, 2003 - March 6, 2003
Inspector:	Ross B. Landsman, Project Engineer
Approved by:	Christopher G. Miller, Chief Decommissioning Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Big Rock Point Restoration Project
NRC Inspection Report 07200043/2003-001(DNMS)

Operation of an Independent Spent Fuel Storage Installation

This inspection included direct observation of the loading and transfer of spent fuel storage casks three through seven. The seventh contained the last fuel bundle being removed from the fuel pool. The loadings demonstrated the cask team's thorough understanding of the NRC's requirements and licensee procedures. The cask team reinforced good safety and radiation protection practices. Management involvement was evident throughout the evolutions. A number of unanticipated problems occurred which were quickly brought to the attention of management, and good investigative effort resulted in technically sound solutions.

Report Details[1]

1.0 Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855)

a. Inspection Scope

The inspector observed various portions of the loading of casks three through seven, to verify compliance with the Certificate of Compliance (C of C), the Safety Analysis Report (SAR), Technical Specifications (TS), licensee loading procedures, and 10 CFR Part 72 requirements.

b. Observations

The activities observed were well controlled and successfully completed. After the seventh cask was removed from the spent fuel pool (SFP), the seventh cask's shield lid was not welded onto the cask. The cask was adequately supported to meet seismic design criteria. The cask lid was left un-welded until the licensee could complete a cleaning and survey of the SFP for any fuel pieces, which was expected to take several weeks. The licensee was continuously monitoring the annulus between the canister and transfer cask and the canister for water level and water temperature. The NRC reviewers including the Spent Fuel Project Office (SFPO) staff agreed that not having the lid welded was acceptable, during a March 5, 2003, telephone conversation between the licensee staff, the SFPO staff, and the inspector. A number of minor problems occurred during the five loadings. These problems are addressed in the following sections of the inspection report.

Transfer Cask Contamination

After the third fuel canister had been transferred to the storage cask from the transfer cask, the licensee found loose surface contamination averaging about 24,000 dpm/100cm^2 on the inside of the transfer cask. The TS contamination limit on the canister was 1000 dpm/100cm^2 for the accessible external surfaces, and this limit was not exceeded. However, the licensee was unsure as to whether the inaccessible portions of the canister could be contaminated, based on the fact that the inside of the transfer cask had been adjacent to the inaccessible portions of the canister.

The licensee performed a safety evaluation to determine if the "as-is" condition was acceptable when compared against the radiological and industrial safety risk of moving the canister back into the transfer cask and attempting to conduct additional decontamination of the canister. The licensee concluded that additional decontamination of the canister wasn't justifiable based on a RESRAD computer model run that assumed the following:

1) Contamination levels were 50,000 dpm/100cm^2;

2) Contamination was uniformly distributed over the entire surface of the canister; and,

3) All contamination was released to the environment within one year.

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[1]NOTE: A list of acronyms used in the report is included at the end of the Report Details.

These assumptions resulted in a 0.18 mrem/yr calculated maximum dose to a member of the general public, which is equivalent to 0.1 percent of the design atmospheric release dose rate calculated in the SAR. Therefore, even if the canister was contaminated, there would be an insignificant increase in dose to the general public. The NRC reviewers including SFPO staff agreed with the conclusion that the "as-is" condition was acceptable, during a telephone call between the licensee staff and the NRC staff on January 16, 2003.

The licensee could not determine with certainty whether the transfer cask was contaminated from the third loading or previous loadings. Thus, the first and second canisters may also have had external surface contamination greater than 1000 dpm/100cm^2. However, because of the previously discussed safety evaluation, each of the first two casks would also be less than or equal to 0.1 percent of the SAR design canister leak rate, making their "as-is" condition acceptable.

Defective Canister Lid

During the machining of the third fuel canister outer lid for final fit-up, the machinists noticed unsuspected porosity and non-fusion in what appeared to be a weld repair area on the lid. The licensee subsequently removed the indications that were discovered during the machining. Technicians completed a dye penetrant exam to verify the complete removal of the indications before using the lid.

The reason the licensee was not aware of the lid weld repairs was that the fabricator documented the weld repairs on the fabricator's travelers for the lid, but repairs didn't rise to the level of a condition report. A record search indicated that the lid for the fifth canister also had a documented weld repair which was subsequently machined out as well. Manufacturing quality is an industry concern because similar weld repairs on other licensee's cannisters and lids also had unacceptable fabrication shop weld repairs that had to be repaired on-site even though the canisters and lids were shipped from the fabricator as acceptable. Closer vigilance to manufacturing process quality control is necessary to prevent future occurrences of the type.

Damaged Fuel

Prior to the dry cask loading campaign, the licensee inspected all the fuel to look for fuel bundle damage. Forty-eight bundles were damaged. The licensee's loading procedure also required a visual inspection of each fuel bundle to identify unexpected damage. Because of this conservative step, three extra bundles were identified as potentially damaged, and two were placed into damaged fuel cans. Upon closer examination, the licensee determined the third bundle to be undamaged. However, the licensee found the fuel bundle to contain mixed oxide (MOX) fuel from 1969 of a different pellet oxide combination and geometry, which the licensee did not consider in the original SAR criticality analysis. Further review revealed a second bundle of similar MOX fuel.

Prior to these two fuel bundle placements, the licensee performed a safety evaluation to comply with 10 CFR requirements with respect to the original licensing basis of the fuel. That evaluation determined that the original licensing basis evaluations completely bounded these two bundles for structural, thermal, shielding, and atmospheric release. In addition, the licensee determined that the allowance of these MOX fuel bundles in the casks would have no effect on the cask system design, or on any of the operating or handling procedures. With respect to criticality, the analysis showed that all criticality

requirements were still met with the revised fuel pellet geometry and material compositions in the MOX rods. After the evaluation was completed, these two bundles were placed into casks six and seven.

Heavy Haul Trailer (HHT)

During movement of the loaded sixth cask and overpack off the HHT onto the storage pad, an air lift bearing caught the edge of the sheet metal sheet covering the gap between the HHT and the storage pad and pushed the sheet metal sheet aside. This caused an air gap between the HHT and the storage pad, causing air pressure in the air lift bearing to be lost in the gap. The loaded overpack tilted slightly to the side that lost supporting pressure and the trailer tilted slightly. The licensee immediately reduced all air pressure, and righted the overpack. The licensee brought in jacks to raise the overpack and replace the sheeting, and subsequently, placed the overpack safely on the storage pad. However, the fact that the HHT tilted was not immediately resolved. The licensee planned to fully understand the movement before moving before moving the seventh cask to the storage pad.

c. Conclusions

The loadings demonstrated the cask team's thorough understanding of the NRC's requirements and licensee procedures. The cask team reinforced good safety and radiation protection practices. Management involvement was evident throughout the evolutions. A number of unanticipated problems occurred which were quickly brought to the attention of management, and good investigative effort resulted in technically sound solutions.

2.0 Exit Meeting

The inspectors presented inspection results to members of licensee management at the conclusion of the inspection on March 6, 2003. The licensee acknowledged the findings presented. The licensee did not identify any documents or processes reviewed by the inspectors as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

K. Haas, Plant General Manager
W. Trubilowicz, Dry Fuel Storage Manager
G. Withrow, Engineering, Operations & Licensing Manager
P. Donnelly, Readiness Review Manager

INSPECTION PROCEDURE USED

IP 60855 Operation of an ISFSI

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

C of C	Certificate of Compliance
HHT	Heavy Haul Trailer
ISFSI	Independent Spent Fuel Storage Installation
MOX	Mixed Oxide
NRC	Nuclear Regulatory Commission
SAR	Safety Analysis Report
SFP	Spent Fuel Pool
SFPO	Spent Fuel Project Office
TS	Technical Specifications

LICENSEE DOCUMENTS REVIEWED

Licensee documents reviewed and utilized during the course of this inspection are specifically identified in the “Report Details” above.