



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351

March 10, 2004

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

**SUBJECT: BIG ROCK POINT INSPECTION REPORT 05000155/2003-007(DNMS)**

Dear Mr. Haas:

On February 20, 2004, the NRC completed an inspection at the Big Rock Point Nuclear Plant. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements. Specifically, the inspector evaluated decommissioning support activities and radiological safety. At the conclusion of on-site inspections on December 4, 2003, January 15, 2004, and February 20, 2004, the inspectors discussed the inspection findings with you and members of your staff.

This inspection consisted of an examination of decommissioning activities at the Big Rock Point Nuclear Plant as they relate to safety and compliance with the Commission's rules and regulations. 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.

Based on the results of this inspection, the NRC did not identify any violations. The decommissioning activities reviewed were being conducted in accordance with applicable regulations and license conditions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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). The ADAMS system is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

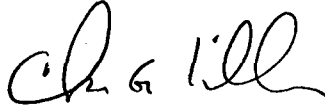
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K. Haas

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

Sincerely,



Christopher G. Miller, Chief  
Decommissioning Branch

Docket No. 05000155  
License No. DPR-6

Enclosure: Inspection Report 05000155/2003-007(DNMS)

cc w/encl: R. A. Fenech, Senior Vice President,  
Nuclear, Fossil, and Hydro Operations  
John King, Michigan Public Service Commission  
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Department of Attorney General (MI)  
Emergency Management Division, Michigan Department of State Police

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION III**

**Docket No.** 05000155

**License No.** DPR-6

**Report No.** 05000155/2003-007(DNMS)

**Licensee:** Consumers Energy Company

**Facility:** Big Rock Point Nuclear Site

**Location:** 10269 U.S. 31 North  
Charlevoix, MI 49720

**Dates:** December 1-4, 2003  
January 12-15, 2004  
February 17-20, 2004

**Inspectors:** William Snell, Health Physics Manager  
Michael LaFranzo, Radiation Specialist  
Gene Bonano, Radiation Specialist  
Chris Martin, Health Physicist

**Approved by:** Christopher G. Miller, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

## **EXECUTIVE SUMMARY**

### **Big Rock Point Restoration Project NRC Inspection Report 05000155/2003-007(DNMS)**

This routine decommissioning inspection involved review of the licensee's performance related to decommissioning support activities and radiological safety. During this inspection period, major activities reviewed included demolition and decontamination activities, and radiological surveys.

#### **Decommissioning Support Activities**

- The inspectors determined that the licensee conducted decommissioning activities in accordance with procedural requirements and in a safe manner. Licensee personnel were knowledgeable of the radiological conditions in their work areas. Workers demonstrated effective communications and work practices. The material condition of facilities and equipment was acceptable. Housekeeping was adequate. (Section 1.1)
- The inspectors did not identify any violations or concerns regarding the licensee's review and characterization of Condition Reports. (Section 1.2)

#### **Radiological Safety**

- The licensee implemented the survey program in accordance with the NRC's regulatory requirements for decommissioning reactors and the licensee's decommissioning procedures. (Section 2.1)
- The licensee met regulatory requirements for the processing and shipping of low-level radioactive waste for disposal and transportation. No violations of NRC and Department of Transportation (DOT) regulations were identified. (Section 2.2)
- The inspectors did not identify any concerns during observations of the licensee's collection of well water samples for radioanalytical analysis. Comparisons between the licensee's analytical results and those from ORISE on split samples indicated acceptable agreement. Overall results indicated the licensee's well water sampling and radioanalytical analysis of water samples was acceptable. (Section 2.3)

## Report Details<sup>1</sup>

### 1.0 Decommissioning Support Activities

#### 1.1 Status of Decommissioning (71801, 83750)

##### a. Inspection Scope

The inspectors evaluated decommissioning activities to verify that the licensee was conducting work in accordance with procedural requirements and in a safe manner. The inspectors conducted numerous site tours to observe licensee staff conducting decommissioning activities. Activities observed included: scabbling, decontamination and surveys of equipment and building surfaces, radiation protection work practices, movement of heavy loads, demolition activities, and overall licensee oversight of work. The inspectors discussed work activities with health physics technicians and workers during the tours to verify they understood the radiological issues pertinent to their assigned work.

##### b. Observations and Findings

Licensee staff were knowledgeable of their work assignments and attentive to their individual tasks. The inspectors found the licensee staff to be cognizant of the radiological conditions in their work area and aware of what actions could cause the radiation levels to change. Workers were observed communicating effectively, demonstrating appropriate concern for industrial safety, conducting work in accordance with procedural requirements, and employing good work practices. The material condition of facilities and equipment was acceptable. Housekeeping was adequate.

The inspectors observed that licensee staff were wearing appropriate anti-contamination clothing and dosimetry, and followed proper technique when removing anti-contamination clothing.

##### c. Conclusion

The inspectors determined that the licensee conducted decommissioning activities in accordance with procedural requirements and in a safe manner. Licensee personnel were knowledgeable of the radiological conditions in their work areas. Workers demonstrated effective communications and work practices. The material condition of facilities and equipment was acceptable. Housekeeping was adequate.

#### 1.2 Self-Assessment, Auditing & Corrective Actions (40801)

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<sup>1</sup>A list of acronyms used in the report is included at the end of the report.

a. Inspection Scope

The inspectors observed licensee management during their review of numerous Condition Reports (CRs). Specifically, the inspector observed licensee management review the following CRs: C-BRP-03-0271, -03-0270, -03-0238, -03-0243, -03-0227, -04-007, -04-008, -04-009, -04-010, -04-011, -04-045, -04-046, -04-047, -04-048, and -04-049. The inspectors observed the licensee: 1) determine if all information was available regarding the incident, 2) characterize each CR in accordance with the licensee's procedures, 3) determine if the root cause was appropriate, and 4) determine what appropriate corrective or follow-up actions should be taken.

b. Observations and Findings

Licensee management adequately: 1) determined that all information was available regarding the incident or addressed what additional information was necessary, 2) characterized each CR in accordance with the licensee's procedures, 3) determined the root cause was appropriate or recommended additional review, and 4) determined appropriate corrective or follow-up actions.

c. Conclusions

The inspectors did not identify any violations or concerns regarding the licensee's review and characterization of Condition Reports.

2.0 Radiological Safety

2.1 Inspection of Final Surveys (83801)

a. Inspection Scope

The inspectors reviewed the licensee's survey packages, which contained pre-demolition radiological survey results, verification survey results, historical basis for survey area classification, instrumentation calibration information, survey grid layouts, and photographs of the survey areas. The inspectors reviewed the following work packages for the Service Building: Work Package 2003-0053, "Radiation Protection, Room 206;" Work Package 2003-0057, "Instrument Laboratory, Rooms 314/315;" Work Package 2003-0061, "Control Room;" Work Package 2003-0068, "Room 322;" Work Package 2003-0070, "Passage Way, Room 200;" Work Package 2003-0077, "Technical Support Center Closet, Room 321;" Work Package 2003-0078, "Vestibule, Room 323;" Work Package 2003-0080, "North Stairway, Stair No. 1;" Work Package 2003-0081, "South Stairway, Stair No. 2;" and Work Package 2003-0103, "Lobby/Vestibule." The inspectors also reviewed Work Package 2003-0028, "Poured Concrete Vehicle Barriers, Wooden Decks, and Walkways Screening Survey Package (non-impacted material);" and Work Package 2003-0075, "Turbine Building, Heating Boiler, Room 107." The inspectors reviewed the licensee's procedures, evaluated the licensee's compliance with the regulations, and interviewed the staff regarding the conduct and results of the surveys for the Service Building and for the non-impacted bulk material.

b. Observations and Findings

The inspectors did not identify any concerns with the licensee's implementation of its survey program. The survey packages contained pre-demolition radiological survey results, verification survey results, historical basis for survey area classifications, instrumentation calibration information, survey grid layouts, and photographs of the survey areas, and were conducted in accordance with the licensee's decommissioning procedures. Verification survey teams demonstrated competence in conducting the surveys and maintained independence from previous survey teams conducting screening and final surveys.

The licensee demonstrated that structures that were ready for demolition had been surveyed and were verified to have radioactive contamination levels less than 5000 disintegrations per minute (dpm) per 100 square centimeters (cm<sup>2</sup>). The limit complies with the provisions of a licensee request for the disposal of demolition debris that was approved by the NRC in a letter dated February 5, 2002. All associated work packages were complete and organized in accordance with the following licensee procedures: Bulk Material Release-1 (BMR), "Establishing Reference Grid Systems;" BMR-3, "Isolation and Control Measures for Screening Surveys;" BMR-4-2, "Pre-Demolition Screening Survey;" BMR-5, "Performance of Pre-Demolition Screening Survey;" BMR-6, "Pre-Demolition Independent Verification Survey;" and BMR-30, "Area Classifications."

c. Conclusions

The licensee implemented the survey program in accordance with the NRC's regulatory requirements for decommissioning reactors and the licensee's decommissioning procedures.

2.2 Solid Radioactive Waste Management and Transportation of Radioactive Materials (86750)

a. Inspection Scope

The inspectors reviewed Radioactive Material Transportation Record (RMTR) # S-2272, for the steam drum shipment and all associated shipping documents. The inspectors also reviewed internal audits, evaluated compliance with the regulations, and interviewed staff regarding the implementation of the radioactive waste program including shipments for disposal of radioactive materials.

b. Observations and Findings

The NRC inspectors determined that the radioactive steam drum was processed and shipped in accordance with the licensee's procedures, and with NRC and Department of Transportation (DOT) regulations. The licensee staff organized and managed the documentation in accordance with licensee procedures and demonstrated great attention to detail. Licensee management conducted an audit of the steam drum shipment, which the NRC inspectors determined to be adequate. An audit was completed for every shipment that is processed before the material leaves the site. The licensee did not identify any problems resulting from the audit.

c. Conclusions

The licensee met regulatory requirements for the processing and shipping of low-level radioactive waste for disposal and transportation. No violations of NRC and DOT regulations were identified.

2.3 Radioactive Waste Treatment, and Effluent and Environmental Monitoring (84750)

a. Inspection Scope

The inspectors observed the licensee collect environmental samples from six on-site monitoring wells. Specifically, the inspectors observed the licensee extract water samples from wells PZ-3D, PZ-3MB, PZ-3MA, PZ-5S, MW-6 and MW-9 using Procedure RCP-53, "Sampling of Site Characterization Piezometer (PZ) Wells," and Procedure RCP-46, "Sampling of the Site Characterization MW Wells." The inspectors obtained split samples from each of the wells noted above and sent the samples to Oak Ridge Institute of Science and Education (ORISE) for independent radiological analysis. The inspectors obtained split samples to evaluate the licensee's sampling analysis program.

b. Observations and Findings

The inspectors determined that the licensee's procedures and techniques for the collection of environmental samples from the onsite monitoring wells were adequate.

A comparison of the radiological results between the licensee and ORISE for tritium (H-3) and carbon-14 (C-14) from the split samples collected from the monitoring wells is listed in the table below. Only three samples contained H-3 in excess of the Minimum Detectable Concentrations (MDCs), and none of the samples detected C-14 in excess of the MDCs. Overall, there was very good agreement between the licensee's and ORISE's analytical results.

Sample Well	H-3 (pCi/L)		C-14 (pCi/L)	
	Licensee <sup>a</sup>	ORISE <sup>b</sup>	Licensee <sup>c</sup>	ORISE <sup>d</sup>
MW-9	341±102	190±230	< 11.3	13±22
PZ-3MB	361±103	290±230	< 11.3	37±22
PZ-5S	315±101	310±240	< 11.3	41±22
PZ-3D	942±124	770±250	< 11.3	15±22
PZ-3MA	3183±182	2900±310	< 11.3	28±22
MW-6	2326±162	2050±290	< 11.3	32±22

<sup>a</sup>The MDC was 200-300 picoCuries/liter (pCi/L).

<sup>b</sup>The average MDC was 390 pCi/L.

<sup>c</sup>The MDC was 11.3 pCi/L.

<sup>d</sup>The average MDC was 37 pCi/L.



In addition to H-3 and C-14, ORISE analyzed the above well water samples for manganese-54 (Mn-54), cobalt-60 (Co-60), zinc-65 (Zn-65), silver-110m (Ag-110m), iodine-129 (I-129), cesium-134 (Cs-134), Cs-137, europium-152 (Eu-152), Eu-154, Eu-155, americium-241 (Am-241), curium-243/244, (Cm-243/244), plutonium-238 (Pu-238), Pu-239/240, Pu-241, iron-55 (Fe-55), nickel-63 (Ni-63), Gross Alpha, and Gross Beta. Because the licensee did not analyze for these isotopes a comparison could not be made. However, all the ORISE radiological detection results were at background levels or less than the MDC levels.

c. Conclusions

The inspectors did not identify any concerns during observations of the licensee's collection of well water samples for radioanalytical analysis. Comparisons between the licensee's analytical results and those from ORISE on split samples indicated acceptable agreement. Overall results indicated the licensee's well water sampling and radioanalytical analysis of water samples was acceptable.

3.0 Inspection Follow-up Item

Closed IFI 05000155/2003005-001: Containment Building Crane malfunction. While attempting to lift the reactor vessel and place it in the shipping container, the Containment Building Crane malfunctioned. The total dose to workers repairing the crane was approximately seven person-rem. Because of the high dose, the licensee committed to analyze the event, and to identify and implement corrective actions.

An experienced manufacturer's representative, who was brought in to inspect the crane, identified several deficiencies in the Main Hoist Brake adjustments. The deficiencies were caused by the lack of adequate maintenance and adjustment over a two-year period of use. The manufacturer's representative reviewed the plant crane surveillance procedures and found that they did not contain criteria needed to make the appropriate wear adjustments of the brake. The lack of criteria was attributed to the relative inexperience of the original crane field representative, who participated in the crane installation two years earlier, and had not provided adequate direction as to what should be included in the site surveillance procedures. The surveillance procedures were revised to include the appropriate adjustment criteria for the Main Hoist Brake and other required vendor information. The licensee issued an Operations Event Report to inform other industry members of potential problems with this manufacturer's crane.

The reactor vessel was subsequently lifted without any problems. The last heavy lift of radiological significance with the Containment Building Crane involved the steam drum. That lift occurred without any problems. The crane is no longer needed, and was being dismantled during the February 2004 inspection. This item is closed.

4.0 Exit Meeting

The inspector presented preliminary inspection results to members of the licensee management at the conclusion of onsite inspections on December 4, 2003, January 15 and February 20, 2004. The licensee acknowledged the findings presented. The licensee did not identify any documents or processes reviewed by the inspector as proprietary.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

Kurt Haas, Site General Manager  
Ken Pallagi, Radiation Protection & Environmental Services Manager  
Greg Withrow, Engineering, Operations & Licensing Manager  
William Trubilowicz, Cost, Scheduling and Purchase Manager

## INSPECTION PROCEDURES USED

IP 40801	Self-Assessment, Audits
IP 71801	Decommissioning Performance and Status Review
IP 83750	Occupational Radiation Exposure
IP 83801	Inspection of Final Surveys at Permanently Shutdown Reactors
IP 84750	Radwaste Treatment, and Effluent & Environmental Monitoring
IP 86750	Solid Radioactive Waste Management and Transportation

## ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened</u>	None
<u>Closed</u>	IFI 05000155/2003005-001
<u>Discussed</u>	None

## LICENSEE DOCUMENTS REVIEWED

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

## LIST OF ACRONYMS USED

ALARA	As-Low-As-Reasonably-Achievable
BMR	Bulk Material Release
CR	Condition Report
DNMS	Division of Nuclear Materials Safety
DOT	Department of Transportation
IFI	Inspection Follow-up Item
MDC	Minimum Detectable Concentration
NRC	Nuclear Regulatory Commission
ORISE	Oak Ridge Institute of Science and Education
pCi/L	picoCuries per Liter
PZ	Piezometer
RMTP	Radioactive Material Transportation Record