June 8, 2005

Mr. David A. Christian, Sr. Vice President
and Chief Nuclear Officer
Dominion Resources
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION UNIT 2 - NRC INSPECTION REPORT NO. 05000336/2005007

Dear Mr. Christian:

On May 18, 2005, the U.S. Nuclear Regulatory Commission completed its inspection of your reactor vessel head replacement project at your Millstone Power Station Unit 2. The enclosed inspection report documents the inspection findings, which were discussed on May 18, 2005, with Mr. Alan Price, and other members of your staff.

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

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

Sincerely,

/RA/

John R. White, Chief
Plant Support Branch 2
Division of Reactor Safety

Docket No. 50-336
License No. DPR-65

Enclosure: Inspection Report 05000336/2005007

cc w/encl:
J. A. Price, Site Vice President, Millstone Station
C. L. Funderburk, Director, Nuclear Licensing and Operations Support
D. W. Dodson, Supervisor, Station Licensing
L. M. Cuoco, Senior Counsel
C. Brinkman, Manager, Washington Nuclear Operations
J. Roy, Director of Operations, Massachusetts Municipal Wholesale Electric Company
First Selectmen, Town of Waterford
R. Rubinstein, Waterford Library
J. Markowicz, Co-Chair, NEAC
E. Woollacott, Co-Chair, NEAC
E. Wilds, Director, State of Connecticut SLO Designee
J. Buckingham, Department of Public Utility Control
G. Proios, Suffolk County Planning Dept.
R. Shadis, New England Coalition Staff
G. Winslow, Citizens Regulatory Commission (CRC)
S. Comley, We The People
D. Katz, Citizens Awareness Network (CAN)
R. Bassilakis, CAN
J. M. Block, Attorney, CAN

Distribution w/encl **(VIA E-MAIL)**:
S. Collins, RA
M. Dapas, DRA
S. Lee, RI OEDO
D. Roberts, NRR
V. Nerses, NRR
G. Wunder, NRR
S. Schneider, Senior Resident Inspector
E. Bartels, Resident OA
P. Krohn, RI
S. Barber, RI
T. Madden, OCA
Region I Docket Room (with concurrences)
ROPreports@nrc.gov
A. Blough, DRS
R. Crlenjak, DRS
J. Monninger, DRS
M. Modes, DRS
A. Passarelli, DRS
J. White, DRS

DOCUMENT NAME: E:\Filenet\ML051590242.wpd

SISP Review Complete: JRW (6/8/05) (Reviewer's Initials)
After declaring this document "An Official Agency Record" it **will** be released to the Public.
To receive a copy of this document, indicate in the box: **"C"** = Copy without attachment/enclosure **"E"** = Copy with attachment/enclosure **"N"** = No copy

OFFICE	RI/DRS		RI/DRP		RI/DRS					
NAME	Apassarelli (AP)		PKrohn (PK)		JWhite					
DATE	06/07/05		06/07/05		06/08/05					

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	05000336
License No:	DPR-65
Report No:	05000336/2005007
Licensee:	Dominion Nuclear Connecticut, Inc.
Facility:	Millstone Power Station, Unit 2
Location:	P. O. Box 128 Waterford, CT 06385
Dates:	January 10 - May 18, 2005
Inspectors:	M. Modes, Senior Reactor Engineer A. Passarelli, Reactor Engineer
Approved by:	John R. White, Chief Plant Support Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000336/2005007; 01/10/05 - 05/18/05; Millstone Power Station Unit 2; Reactor Vessel Head Replacement IP71007.

This inspection was conducted by two Region I inspectors. No findings of significance were identified.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

5. OTHER ACTIVITIES [OA]

5R01 Reactor Vessel Head Replacement Inspection (71007 - 1 Sample)

a. Inspection Scope

DESIGN

The inspector verified that key reactor vessel head design aspects, head modifications, and the designs of other related significant modifications were reviewed and approved, by the licensee or authorized inspector, in accordance with procedures and that replacement materials and components meet the appropriate design technical requirements. The technical requirements reviewed included the applicable codes and standards, NRC requirements, and other commitments made by the licensee in the Updated Final Safety Analysis Report (UFSAR). Applicable 10 CFR 50.59 evaluations, and screening for such evaluations, for selected modifications related to head replacement, were reviewed using the guidance contained in NRC inspection procedure IP 71111.02, "Evaluation of Changes, Tests, or Experiments," dated July 7, 2003.

Key design aspects and modifications for the replacement reactor vessel head and other modifications associated with reactor vessel head replacement were reviewed. Adherence to and reconciliation of code requirements were reviewed. These reviews were performed to determine the licensee confirmed that the replacement reactor vessel head conforms to original design requirements and there were no fabrication deviations from design that were not reconciled against current requirements and regulations.

FABRICATION

Fabrication in Japan. Fabrication, completed at the vendor facility in Japan, was performed under the jurisdiction of an Authorized Nuclear Inspector. The NRC inspector verified the Authorized Nuclear Inspector performed required hold-point inspections by reviewing fabrication documentation. The reports generated during the process of manufacturing the head contained the signature of the Authorized Nuclear Inspector at the appropriate times and for the appropriate reasons.

Fabrication at CONUS Vendor. The NRC inspector evaluated the ultrasonic and eddy current inspection of the control element drive mechanisms by direct observation at the vendor facility in New Hampshire. The inspector verified the examinations were conducted by qualified personnel, using qualified procedures. Activities related to this phase of the fabrication and examination were in accordance with the licensee's Quality Assurance program.

The licensee had detailed procedure specifications for the control element motor housings welds, Type 316 full penetration joints and canopy seal welds of the control element drive mechanisms. The licensee implemented a procedure, reviewed by the inspector, for visually examining accessible welds throughout the fabrication and testing process. The inspector also checked the American Society of Mechanical Engineers,

Boiler and Pressure Vessel Code, Section XI, Appendix VIII, qualification records for technicians performing manual ultrasonic examination of pressure housing welds in the control element drive mechanisms at the Westinghouse vendor facility. The inspector viewed the underside of the head and the J-groove welds and the numerical marking of the penetrations. The inspector observed installation of the upper pressure boundary portion of the control element drive mechanisms onto the new reactor head. The inspector also observed argon gas pressure testing of the pressure boundary control element drive mechanism penetrations after the canopy seal welds were in place. The inspector verified that proper procedural steps and sign-offs were completed during the control element drive mechanism installation. For example, that torque wrenches used on the upper pressure housings were calibrated according to the procedure. The inspector reviewed quality control field observation checklists used during installation of the control element drive mechanisms, as well as during shipment of the head from the State Pier in New London to the site warehouse building.

Fabrication at Millstone. The examinations implemented were for the purpose of establishing a preservice inspection in order to verify the integrity of the penetration base materials and each penetration weld to the reactor pressure vessel head. For these examinations, all indications were reported for evaluation regardless of size, depth or location. The examinations included the control element drive, head vent, and the incore instrumentation penetrations. The inspector assessed the inspection activities using the criteria specified in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI. The inspector directly observed the examination of penetrations 43, 45, 48, 52, 55, 63, 66 and 69. For the samples selected, the inspector verified:

A. Procedures were qualified in accordance with the Code and had been reviewed and approved by licensee qualified nondestructive personnel.
B. The procedures being used were supported with appropriate qualification documentation.
C. The procedures contained sufficient instructions indicating the type of apparatus and specified the acceptable ranges of essential variables to be used.
D. All data acquisition and analysis personnel were qualified in accordance with the Code requirements.
E. The equipment used for the examination had been calibrated and was within the current calibration period.
F. All indications observed were recorded.

Training and qualifications of licensee and contract quality control/assurance inspectors, and nondestructive evaluation examiners were reviewed to verify personnel met site and code qualification requirements and were adequately prepared for the site specific tasks.

For the selected welds, weld procedures and welder qualification records were reviewed to confirm that the Code required essential and supplemental essential welding variables for the welding processes used were met. Non-conformance reports were reviewed to confirm that welding deficiencies were dispositioned in accordance with Code requirements.

LIFTING

Engineering design, modification, and analysis associated with reactor vessel (RV) head lifting and rigging including: (1) crane, and rigging equipment, and full load testing, (2) RV head component drop analysis, (3) safe load paths, and (4) lay-down areas, were reviewed prior to any head movement. Because the reactor was completely defueled prior to load handling activities, there was no impact on the reactor core or spent fuel nor on cooling and plant support systems for the reactor unit and common systems for the other operating unit at the site. The inspector verified there were no design changes and modifications to systems, structures, and components described in the FSAR for transporting the new and old reactor vessel heads in and out of the plant respectively.

Activities associated with lifting and rigging were reviewed including: preparations and procedures for rigging and heavy lifting including any required crane and rigging inspections, testing, equipment modifications, lay-down area preparations, and training of crane and rigging personnel. The inspector verified the capability of the lifting equipment, including fixtures and rigging, to handle the load were established by analysis.

The licensee's plans and analysis for lifting and rigging of heavy loads were reviewed to verify that lifting equipment and rigging are capable of lifting and moving the reactor head, and the safe load path for component removal and reinstallation was technically sound. The component drop analysis was reviewed to verify, in general, that the potential offsite releases at the exclusion area boundary were within 10 CFR Part 100 limits and equipment to maintain safe shutdown was unaffected.

RADIATION PROTECTION

The radiation protection program controls, planning, and preparation was reviewed in the following areas utilizing applicable portions of the baseline inspection procedures IP 71121.01 and 71121.02 using as guidance the following parameters:

G. As Low As Reasonably Achievable (ALARA) planning.
H. Job dose estimates and dose tracking.
I. Exposure controls including temporary shielding.
J. Airborne and Contamination controls.
K. Radioactive material controls and management.
L. Radiological work plans and controls.
M. Emergency contingencies.
N. Project staffing and training plans.

Radiological source term was evaluated. The presence of hard-to-detect radionuclides including transuranics was specifically reviewed.

SECURITY

Security considerations associated with vital and protected area barriers that were affected during replacement activities were reviewed by qualified NRC security inspection personnel. Security inspections were performed to assure that intended breaches in the perimeter protection, made for the purpose of head movement, were adequately compensated for.

POST-INSTALLATION TESTING

Post-installation verification and testing inspections were reviewed in the following areas:

A. The licensee's post-installation inspections and verifications program and its implementation.
B. The conduct of reactor coolant system leakage testing and review the test results.
C. The procedures for equipment performance testing required to confirm the design and to establish baseline measurements and the conduct of testing.
D. Compliance with regulatory requirements including the incorporation of inservice inspection requirements of 10 CFR 50.55a (g).
E. Adherence to and reconciliation of Code requirements.

The inspector reviewed the licensee's post-installation verification and testing program to verify that modifications were completed in accordance with the design; that drawings, procedures, and training were already updated or where immediate attention was not required plans were in place to update as appropriate; that post-installation walkdowns and inspections were performed to ensure equipment was restored and temporary services were removed; that equipment cleanliness was verified; that pre-service inspection of welds to establish baseline data was performed; and that deficiencies were properly dispositioned. The inspector also verified that changes in performance of the reactor vessel head and its associated parameters, such as flow rates, pressures, and temperatures were appropriately included in design documents and plant procedures.

The inspector verified testing satisfied the Code and applicable regulatory requirements, that testing was conducted according to procedures, and that results were satisfactory or properly resolved.

STORAGE

The inspector reviewed radiological safety plans for storage of the old reactor vessel head on site. The storage facility, consisting of a one inch thick steel vessel placed over the reactor head, was reviewed to verify that access was properly controlled, did not create the potential for an unmonitored effluent release pathway, and that external radiation levels at the perimeter would be below applicable limits, and dose rates at the perimeter were below applicable limits. The storage of the old reactor vessel head met the criteria contained in Generic Letter 81-38, "Storage of Low-Level Radioactive Wastes at Power Reactor Sites."

The old reactor head is stored on-site in a one inch thick container. The old head is located next to Building 100. Assuming a point source of radiation consisting of 5 Ci of Co-60 the total exposure at 1700 feet is less then 1.1E-4 mR/hour. Except for a small portion of the bay, which is not contained in a restricted zone, a circle with a radius of 1700 feet is contained within the owner controlled area. Occasional fisherman would conservatively receive an exposure far less than the 25 mrem/year limit of 40 CFR 190.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

On May 18, 2005, the inspectors presented inspection results to Mr. Michael Wilson and other members of the Millstone staff during a final exit meeting. No proprietary information was reviewed during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Price, Site Vice-President
M. Doucette, Lead Engineer
R. Schriener, Engineering
T. Petit, Project Manager
R. McIntosh, Licensing
D. Dodson, Licensing Supervisor
L. Picarazzi, Scheduling

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Closed

None.

LIST OF DOCUMENTS REVIEWED

Design

DCR #M2-04001, Millstone Unit 2 Reactor Vessel Head Replacement Project, incl. 50.59 screening form

Magnetic Jack Type Control Element Drive Mechanism Design and Test Report # TR-DT-78, CE

CE Loss of Air Cooling to the Magnetic Jack Mechanism Summary Report, 5/4/71

Millstone Power Station Unit No. 2 – Issuance of Relief Request Re: Use of American Society of Mechanical Engineers Boiler and Pressure Vessel Code Case N-4-12 (TAC No. MC4906)

Loss of Air Cooling to the Magnetic Jack Mechanism Summary Report 00006, 30-20-80

Westinghouse Drawing No. E-18767-163-001, Magnetic Jack Assy (CEDM)

Westinghouse Drawing No. E-18767-163-003, CEDM Outline and Installation dwg

Westinghouse Drawing No. E-18767-163-004/5, CEDM Installation dwg

Manufacturing

MP-02-NO-GDL406, QC Field Observation Checklist
Test Report for Production Testing of the First Production Five Coil Control Element Drive Mechanism Motor Assembly, Test Report No. PT-CEDM-2400408-01

PCI Energy Services ASME XI Welding Procedure Specification Record No. 8-SW-CE-3-MN/MC-GTAW, CE Design Canopy Seal Welding

PCI Energy Services Reactor Vessel CEDM/RVLIS and Closure CAP Installation Using Standard “D” Weld Head

PCI Energy Services, General Quality Procedure, Visual Examination of Welds

Domestic Packaging Procedure for CEDM Equipment, Chick Packaging Inc.

CEDM Motor Housing Assembly P/N N6000

CEDM Upper Pressure Housing Assembly P/N N3220

RVLMS Pressure Housing Assembly Weld Map No. WM-2400408-03

RVLMS Shroud Assembly Weld Map No. WM-2400408-04

CEDM Pressure Housing Assembly Weld Map No. WM-2400408-05

Detailed Welding Procedure Specification, DWPS No: I- 20-8.8-10, Grade 316 to 316

Detailed Welding Procedure Specification, DWPS No: WMB –20-3, Type 403 Martensitic SS

AREVA UT Calibration Data Sheet for CEDM housing welds

AREVA NDE Procedure, Manual Ultrasonic Examination of Dissimilar Metal Piping Welds

Performance Demonstration Initiative Program Specific Detail of Qualifications, ID#477-64-9663

VPROC ENG04-2-040 R0 Remote Ultrasonic Examination of Reactor Head Penetrations (54-ISI-100)

VPROC ENG04-2-041 R0 Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations (54-ISI-137)

VPROC ENG04-2-042 R0 Multi-Frequency Rotating Eddy Current Examination of Reactor Vessel Head Penetrations (54-ISI-491)

54-PQ-100-05 Demonstration of Rotating UT Probes (Axial/Circumferential) and Blade Probes (Axial/Circumferential) Using EPRI/MRP Mockups

54-PQ-137-01 Procedure Qualification for Nondestructive Examination by Remote Ultrasonic Examination of Reactor Vessel Head Vent Line Penetrations

54-PQ-491-06 Procedure Qualification of Procedure 54-ISI-491-05 (Eddy Current of Reactor Vessel Head Penetrations without Thermal Sleeves)

ISI-100 R0 Remote Ultrasonic Examination for Sizing Axial Flaws in Control Element Drive Mechanism Nozzles

54-PQ-100-02 Procedure Qualification of 54-ISI-100-05, 102-01 and 103-01 for the Sizing of Axial and Circumferential Flaws in Control Element Drive Nozzles

54-ISI-100-06 Demonstration of Axial and Circumferential Rotating UT Probes on Oconee CRDM Cracked Nozzle Specimens and EPRI/MRP Mockup G

Work Order M2 04 11617 Pre Service Inspections of Reactor Vessel Head Penetrations

NDT Examination Personnel Qualifications (Personnel qualification records were reviewed for seven Level II nondestructive examiners and two Level III supervisors. Qualification documentation reviewed included all training activities including theoretical and practical, graded test results and results of vision testing.)

Equipment Calibration and Certifications RDAU, MIZ-03 S/N 060 Cert 19787

Equipment Calibration and Certifications UTOMOSCAN S/N 11436 Cert 18904

Equipment Calibration and Certifications RDAU, MIZ-30-4 S/N 067 Cert 19733

Equipment Calibration and Certifications U-TOMOSCAN S/N 63592 Cert 18625

Equipment Calibration and Certifications U-TOMOSCAN S/N 63593 Cert 18790

<u>Systems</u>

R.B.C.C.W. System Drawing No. 25203-26002

MNPS –2 FSAR Section 4.3 SYSTEM COMPONENT DESIGN, 4.3.1 Reactor Vessel

MNPS –2 FSAR Section 3.3.3.3 Magnetic Jack Assembly

Installation

U2 CEDM Installation Readiness Review Project # 900321 presentation

Millstone 2R16 Final Readiness Review Head Receipt & CEDM Installation presentation

Millstone U2 Replacement Reactor Vessel Closure Head CEDM Installation and

Preparation for Entry into Containment, VPROC ENG04-2-034

Nuclear Projects Memo, Millstone Unit 2 Reactor Head Replacement, 12/8/04

Rx Head Replacement and Support – 7-day LAH

Millstone U2, Rx Head Replacement High Level Schedule

Bigge Drawing No. 5, Engineering No. 03E40, General Arrangement lift new RVCH with CHD from temporary cribbing to containment hatch

Bigge Drawing No. 5, Engineering No. 03E40, General Arrangement lift new RVCH with CHD from temporary cribbing to containment hatch (12 sheets)

Bigge Drawing No. 11, Engineering No. 03E40, Elevation, General Arrangement lift old RVCH from stand to CHD

Bigge Document No. 2104-P5, Rev. 2, 2/10/05, Procedure to Haul New Head to Containment, Transfer to CHD, Upend and Set on Stand

Qualifications – Rigger Certification, 6/9/04 letter to Westinghouse

Millstone Unit 2 Response to NRC Bulletin 96-02, Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment

Condition Reports

CR-05-00055, Vendor procedures are required to be used in support of the reactor head replacement project

CR-05-01425, During QC/ANI review, numerous inconsistencies and conflicting data were noted, which now cast doubt to the actual material of the RVLMS lower housing

CR-05-01483, MNPS-2-FSAR Section 3.3.3.3 statement has no basis

Operability Determination No. MP2-002-05, CR-05-01483, Magnetic Jack Assembly

CR–05-04030, NRC Inspector requested an engineering disposition of all recorded NDE signals detected during the baseline examination of the replacement RVCH

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
RV	reactor vessel
UFSAR	Updated Final Safety Analysis Report