

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 92-07

Docket No. 50-271

License No. DPR-28

Licensee: Vermont Yankee Nuclear Power Plant
RD #5, Box 169
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Plant

Inspection At: Vernon, VT

Conducted: April 6-10, 1992

Inspector: H. J. Kaplan for P.P.
P. Patnaik, Reactor Engineer
Materials Section, Engineering Branch,
DRS

5/14/92
date

Approved by: E. H. Gray
E. Harold Gray, Chief, Materials Section,
DRS

5/14/92
date

Areas Inspected: Review of non-radiological water chemistry control in the primary system and the inservice inspection of reactor coolant system during the March 1992 outage.

Results: The control of water chemistry was satisfactory and met the BWK owner's group guidelines. There was no abnormal chemistry occurrence in the past six month's data reviewed. The inservice inspection program at Vermont Yankee met the requirements of the applicable code and the NRC regulations. The licensee reported linear indications and rust in the manual cladding portions of reactor vessel head and other locations in the vessel. Licensee's investigation concluded that the indications were the result of stress corrosion cracking of the cladding and there was no evidence that the indications penetrated the base metal.

1.0 WATER CHEMISTRY CONTROL (Inspection Procedure 84750)

1.1 Scope

The water chemistry control program was reviewed during this inspection. Control of non-radiological chemistry is important at nuclear power plants since the presence of impurities in reactor water can initiate erosion/corrosion problems in vessels, piping or valves. It is also important to minimize radiation levels and maintain radioactive effluent releases within safe limits. During the time of the inspection, the Vermont Yankee Nuclear Plant was shutdown due to refueling.

1.2 Findings

The Vermont Yankee Nuclear Plant has established administrative controls through the chemistry laboratory quality assurance program (AP-6600) that ensure reliability of data generated by the chemistry department. The program adequately addresses department personnel responsibilities, instrument performance checks, quality control of chemical analysis, calibration and the interlaboratory comparison of samples. In view of the program outlined in AP-6600 calibration records on the reactor vessel pH meter, spectrophotometers and the ion chromatograph were reviewed. The calibrations of the equipment complied with AP-6600.

The plant has implemented the BWR owner's group water chemistry guidelines. A review of daily logs on pH, chloride, oxygen and specific conductivity for the past six months indicated no abnormal chemistry occurrence. Review of the plant procedure #ON 3149, "High Condensate Conductivity" indicated that symptoms of abnormal chemistry due to condenser tube leaks were properly addressed and the operator actions to this event were outlined systematically.

The chemical analysis of the contents of the standby liquid control (SLC) tank was reviewed for the past six months of the plant operation. The analysis met the requirements of the Technical Specification.

The licensee's training program for newly hired chemistry technicians and the continuing training for other technicians was reviewed. This program was found to be complete. The syllabus was comprehensive and the course records were complete.

The inspector reviewed the audit report VY-92-02 of the quality assurance department and determined that the quality assurance coverage of the non-radiological water chemistry program was adequate.

1.3 Conclusion

The licensee has demonstrated an effective means of controlling water chemistry at Vermont Yankee. This is largely due to the proficiency and the training of the staff. The licensee's program complied with the BWR Owner's Group Water Chemistry Guidelines. There was no abnormal chemistry occurrence in the past six months of plant operation as determined from the daily logs on water chemistry.

2.0 INSERVICE INSPECTION (ISI) (73753, 73755)

2.1 Scope

The conduct of inservice inspection by ultrasonic testing ensures integrity of the reactor coolant pressure boundary. During this inspection, the ISI data on the third period of the second inservice inspection interval were reviewed. This review was performed to ascertain if the requirements of the ASME Code, Section XI and the Technical Specification were met.

2.2 Findings

The licensee conducted the inservice inspection of the reactor coolant system in accordance with the ASME Code, Section XI, 1980 edition including the winter 1980 addenda. Within the scope of the review, the ISI plan for the outage complied with the code requirement.

All indications found during inservice inspection were documented in ISI Discrepancy Reports (IDR). The disposition of an indication was done either by an engineering evaluation or by a maintenance work order. A maintenance work order involves repair/replacement of the component. The licensee tracked each IDR through an IDR status log. During the inspection, a sample of IDRs was reviewed to establish the adequacy of the engineering evaluation. The evaluations reviewed were found to be satisfactory.

During the inspection, ultrasonic test data were reviewed on the following welds:

- Reactor pressure vessel to recirculation nozzle welds H, J & K
- Residual heat removal (RHR) system welds, 228-41-7130/RH 5A-7208 and 228-41-7129RH 5A-5217.

Reviews of the technique sheet on the welds, the calibration record and the test results were satisfactory.

The magnetic particle examination data sheets on the following welds were reviewed.

Residual heat removal component/weld #225-41-7129/RH 5A-5217
 Core spray "A" component/weld #225-40-1112/CS 2A-536
 Core Spray component/weld #285-15-1510-H-52
 Main steam component/weld #115-07-4184/C8

The data conformed to use of the technique as outlined in the procedure YA-MP-111, Rev. 3.

The visual examination reports on the following supports in various safety-related systems were reviewed.

High pressure coolant injection component #273-33-3325 (H-32)
 Core spray component #273-21-1314 (CS-HD546)
 Service water component #373-20-2401 (RSW-H-215)
 Reactor water cleanup component #173-04-9302 (CU-2)
 Residual heat removal component #273-40-7376 (RHR-HD129e)
 Residual heat removal component #273-13-7437 (RHR-HD-4)
 Feedwater component #173-04-2309 (FW-9)
 Recirculation component #151-02-6701 (V2-43A)

The examination of supports conformed to the requirements of the procedure YA-VT-11, Rev. 3.

The data pertaining to in-vessel visual inspections performed by the licensee's contractor were reviewed. The inspection identified a 4" long crack in the top fillet weld area of the dryer support bracket at 215 degree azimuth. Further, visual inspection of the internal surfaces of the reactor vessel head indicated rust on the stainless steel cladding at the area of the flange to head butt weld and on the manual cladding of the dollar plate section of the head. Some of the areas of rust were associated with linear indications. The licensee performed an extensive ultrasonic examination and manual exploration of a typical "worst case" linear indication to investigate the nature and depth of the indications. It was concluded that the indications were the result of stress corrosion cracking of the cladding and there was no evidence that the indications penetrated the base metal. The licensee notified the Office of Nuclear Reactor Regulations on this issue, requesting relief from the applicable code requirement as documented in Vermont Yankee letter BVE 92-055 dated April 5, 1992 to NRC.

Certifications of personnel performing ultrasonic and visual examinations were reviewed in accordance with the requirements of the procedure. The certifications were readily available, complete and met the requirements of the procedure.

The material certifications on ultrasonic calibration blocks for the reactor vessel were reviewed to verify the type of material. For the calibration block identified in the report as RV-3, used during examination of the reactor vessel nozzle to shell and other locations in the vessel, the certification was not available in the records. The licensee analyzed a sample from the test block

to establish the type of material used. The results of the analysis confirmed that the test block material is representative of that used in the Vermont Yankee reactor vessel. The chemistry and the mechanical properties were indicative of SA SA-533 Grade B, Class I material used to fabricate the reactor vessel.

2.3 Conclusion

Based on the review of non-destructive examination records, procedures and interviews with personnel, the inservice inspection program at Vermont Yankee, was found to meet the requirements of the applicable code and the NRC regulations.

3.0 Entrance and Exit Meetings

Members of the licensee's management, engineering and technical staff were informed of the scope and the purpose of the inspection at the entrance meeting which took place on April 6, 1992. The findings of the inspection were presented to and discussed with members of the licensee's management at the conclusion of the inspection on April 10, 1992. A list of attendees at the exit meeting is attached to this report as Attachment 1.

ATTACHMENT 1

Vermont Yankee Nuclear Power Corporation

D. Reid, Plant Manager
R. D. Pagodin, Technical Services Superintendent
R. J. Wanczyk, Operations Superintendent
S. Skibniowsky, Chemistry Supervisor
R. P. Grippardi, Quality Assurance Supervisor
D. Girroir, Senior Mechanical Engineer, ISI
D. King, ISI Support

U.S. Nuclear Regulatory Commission

P. Harris, Resident Inspector