U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-289/85-16

Docket No. 50-289

License No. DPR-50 Priority - Category C

Licensee: GPU Nuclear Corporation
P.O. Box 480
Middletown, Pennsylvania 17057

Facility Name: TMI-1

Inspection At: Middletown, Pennsylvania

Inspection Conducted: April 22 - 26, 1985

Inspectors: P. C. Wen, Reactor Engineer — 5/17/85 date

U. Cheh, Reactor Engineer — 5/17/85 date

Approved by: L. H. Bettenhausen, Chief
Operations Branch, DRS — 5/17/85 date

Inspection Summary: Inspection on April 22 - 26, 1985 (Inspection Report No. 50-289/85-16)

Areas Inspected: Routine, unannounced inspection of restart preoperational test program including preoperational test results evaluation. The inspection involved 76 inspection-hours onsite by two region based inspectors.

Results: No violations were identified.

DETAILS

1.0 Persons Contacted

B. Ballard, Manager of QA, Modification/Operations
*T. Hawkins, Manager, Start-up and Test
E. Kreahling, Start-up and Test Engineer
J. Paules, Shift Foreman
F. Paulewicz, Senior Engineer
M. Shaeffer, Start-up and Test Engineer
L. Wickas, Operations QA Manager

NRC

*R. Conte, Senior Resident Inspector
F. I. Young, Resident Inspector

*Denotes those present at exit interview on April 26, 1985.

2.0 Preoperational Test Results Evaluation

The inspector reviewed 4 completed preoperational test results. The review was conducted to ascertain whether uniform criteria are being applied for evaluating completed preoperational tests and to assure technical and administrative adequacy of the completed procedures. The following test results were reviewed:

2.1 Once Through Steam Generator (OTSG) Primary-to-Secondary Leakage Determination

In November, 1981, the licensee discovered the OTSG tube leak due to sulfur contamination. The damaged tubes were repaired using the kinetic expansion technique and a hot functional test (HFT) was conducted on August, 1983, to determine the baseline OTSG primary to secondary leak rate. A baseline leak rate of 1 gallon per hour (gph) was derived from that test (GPU Technical Data Report #488, Rev. 0). In June, 1984, the bubble and drip tests revealed some tube leaks. At about the same time, problems with loose/missing plugs were also identified. The licensee took corrective actions which included:

(1) Plugged 3 identified 'leakers' (OTSG 'A' 80-45, 70-7 and 79-41)

(2) Performed plug pull test and subsequently rerolled all Westinghouse plugs and replugged all missing plug tubes.

(3) Performed eddy current test per TS 4.19. Tubes with indications greater than 40% through wall were all plugged.

After the completion of these corrective actions, the licensee conducted another OTSG HFT on April 10 - 19, 1985.

Nineteen curies of tracer radionuclide (Kr-85) were injected into the reactor coolant system per procedure STP 1-85-0012, 'Tracer Gas Injection into the RSC'. The OTSG primary to secondary leakrate was determined by measuring condenser off-gas activity. The preliminary test results from RM-A5, RM-A13 and Nuclear Research Corporation Radiation Monitor indicate that the primary to secondary leakage during the steady state periods was about 0.2 - 0.5 gph. The preliminary results are being verified by KR-85 analysis of off-gas grab samples which were sent to Teledyne Isotopes Laboratory. The inspector will review this test following verification of test results and licensee's administrative approval of the test results. This will be tracked under existing similar item of 289/84-07-03.

The inspector reviewed the associated RCS leak rate surveillance (SP-1303-1.1) results. The surveillance results indicated that during HFT period the plant conditions were very 'tight' with all calculated leakage well within the TS limits. Using an evaporative loss term (0.27 gpm), the licensee calculated a negative unidentified leakage (from 0.21 to 0.29 gpm). The validity of the evaporative loss term will be followed up in a future inspection.

The inspector also reviewed surveillance procedure 1301-1, "Shift and Daily Checks", Rev. 55 and noted that the TS OTSG tube leak limit was incorporated in the procedure step 7.8.

The inspector had no further questions.

2.2 Two Hour Air Supply EF-V30A & B Functional Test

The licensee performed this test per procedure TP 248/2, Rev. 0 from December, 1983 to January, 1984. The test successfully demonstrated the following:

-- Backup Instrument Air (Compressor) System took over supplying EF-V30A/B and MS-V4A/B valves after Instrument Air (IA) header pressure dropped below approximately 70 psig.

-- Two-Hour Air Supply System took over supplying MS and EF valves after IA header pressure dropped below about 60 psig.

-- Two-Hour Air Supply System was capable of cycling MS and EF valves with both IA and Backup IA systems out of service.

-- The failure positions of valves EF-V30A/B and MS-V4A/B were verified upon loss of all air supply (IA, Backup IA and Two-Hour Air Supply System).

The regulatory requirement on this subject is documented in NUREG-0680. This test and actual two-hour duration test will be further conducted during Low Power Natural Circulation Test, TP 700/2.

The inspector had no further questions.

2.3 Reactor Coolant Pump RCP-1B Test

Following replacement of pump shaft and impeller of RCP-1B, the pump was tested in April and May, 1984. Pump Motor No Load Test was performed in accordance with the procedure STP 474/1, Rev. 0. The motor performance was determined to be satisfactory. No abnormal conditions were identified. The licensee also performed Reactor Coolant Coastdown Flow Test for RC-P-1B per Test Procedure TP 674/2, Rev. 0. The measured coastdown flow characteristics met the test acceptance criteria.

No unacceptable conditions were identified.

2.4 Environmental Qualification Resistance Temperature Detector (EQ RTD) Calibration

The inspector discussed with the cognizant licensee staff and reviewed the following documents:

-- Three Mile Island Nuclear Station Unit No. 1 Start up and Test Generic Instrumentation and Implementation Procedure, TP 300/0, Revision 0 dated March 25, 1985.

-- TP 250/1 and A25E 30468 for Replacement of Incore Thermocouple (T/C) Calibration RTD's.

The objective of the RTD Calibration is two fold;

1. RTD icepoint (reference point) check.
2. Replacement of the RTD's with a decadebox for loop calibration to check and compensate for the EMF-loss for the EQ RTD's.

The equipment calibration was completed in according with Procedure TP250/1. The maximum error of 0.3°F was verified below the tolerance limit of 0.5°F.

The inspector had no further questions.

3.0 Preoperational Test Program

With the verification of all test results being evaluated and approved (with one exception of OTSG Primary-to-Secondary Leakage Determination as described in Section 2.1), this essentially closes out preoperational test program of TMI-1 Restart. The remaining item (289/84-07-03) will be followed up in a future inspection.

4.0 Quality Assurance (QA) and Quality Control (QC) Interface During HFT

QA/QC has an independent audit program consisting of test witness and test verification for the HFT period of April 11 - 19, 1985. The inspector reviewed 12 selective QA Monitoring Reports (QAMR) performed during the HFT period:

Item	Test Date	QAMR NO.	Subject Description
1.	4/16/85	SRC-0242-85	Chemistry Tech. Functions Condenser Vacuum Pump Discharge Teledyne "Water Melon" Sampling for OTSG Testing, QDR SRC-047-85
2.	4/14/85	SRC-0238-85	Chemistry, Determination of RCS Total Gas Activity for Kr Injection Testing
3.	4/14/85	FEK-0272-85	Operations TRACER GAS Injection into the RCS
4.	4/10/85	TDS-609A-85	Tech. Spec. Surveillance/ OPS, Turbine Driven Emergency Feedwater Pump Functional Test and Valve Operability Test
5.	4/12/85	DMW-778-85	Operations, Nuclear Service Closed Cooling Water to Reactor Cooling Pumps
6.	4/15/85	TDS-783-85	Tech. Spec. Surveillance/ OPS, Turbine Driven Emergency Feedwater Pump Functional Test
7.	4/12/85	DMW-784-85	Operations Intermediate Cooling
8.	4/12/85	FEK-0259-85	Operations Plant Heatup to 525°F

9.	4/12/85	FEK-0268-85	Operations Makeup and Purification System
10.	2/20/85	IC-23070-85	Witness Ice Point Check of TE 955A per TP250/ under DRF-027555
11.	3/13/85	IC-23111-85	Witness Loop Calibration of EQ RTD's
12.	3/5/85	EL-13065-85	Final Acceptance Inspection of BA-412468 J.O. A25E-G1468 SO under DRF-027555

All were acceptable.

QAMR No. SRC-0242-85 identified a minor discrepancy for Condenser Vacuum Pump Discharge Teledyne "Water Melon" Sampling for OTSG Testing. QDR SRC-047-85 was issued to resolve this item.

Based on the document review and through discussion with licensee personnel the inspector determined that QA/QC was actively involved in the HFT activities.

No unacceptable conditions were identified.

5.0 Exit Interview

Licensee management was informed of the purpose and scope of the inspection at the entrance interview. The findings of the inspection were periodically discussed and were summarized at the conclusion of the inspection on April 26, 1985. Attendees at the exit interview are denoted in paragraph 1.

No written material was provided to the licensee by the inspector at any time during this inspection.