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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-334/82-16

Docket No. 50-334

License No. DPR-66 Priority -- Category C

Licensee: Duquesne Light Company
435 Sixth Avenue
Pittsburgh, Pennsylvania

Facility Name: Beaver Valley Power Station, Unit 1

Inspection at: Shippingport, Pennsylvania

Inspection conducted: July 8 - August 16, 1982

Inspectors: for W. M. Troskoski, Resident Inspector — 8/26/82 date signed

for W. Lazarus, Reactor Inspector — 8/26/82 date signed

Approved by: L. E. Tripp, Chief, Reactor Projects Section No. 2A, — 8/26/82 date signed

Inspection Summary: Inspection on July 8 - August 16, 1982 (Inspection No. 50-334/82-16).
Areas Inspected: Routine inspections by the resident inspector (150 hours) and one region based inspector (35 hours) of: licensee action on previous inspection findings, plant operations, housekeeping, fire protection, radiological controls, physical security, radwaste operations, surveillance testing, maintenance activities, inoffice and onsite licensee event report review, reactor startup testing, followup on IE Bulletins, and TMI Action Plan Requirements.
Results: Three violations (Failure to restore lifted leads requiring a second verification - detail 3.b.1; Failure to maintain records of technical specification surveillance activities - detail 3.b.3; Failure to take adequate corrective action to limit unauthorized radioactive liquid waste releases - detail 4).

Region I Form 12
(Rev. April 77)

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DETAILS

1. Persons Contacted

F. Bissert, Manager, Nuclear Support Services
J. Carey, Vice President, Nuclear Division
H. Caldwell, Assistant Station Superintendent
M. Coppula, Superintendent of Technical Services
K. Grada, Superintendent of Licensing and Compliance
R. Hansen, Maintenance Supervisor
H. Harper, Security Assistant
J. Indovina, I&C Supervisor
T. Jones, Manager, Nuclear Operations
J. Kosmal, Radiological Operations Coordinator
W. Lacey, Chief Engineer
V. Linnenbom, Radiochemist
J. Lukehart, Security Director
L. Schad, Operations Supervisor
E. Schnell, Radcon Supervisor
J. Sieber, Manager, Nuclear Safety and Licensing
R. Swiderski, Superintendent of Nuclear Construction
N. Tonet, Manager, Nuclear Engineering
H. Williams, Station Superintendent
J. Wenkhous , Reactor Control Chemist

The inspector also contacted other licensee employees and contractors during this inspection.

2. Licensee Action on Previously Identified Inspection Findings

The NRC Outstanding Items (OI) List was reviewed with responsible licensee personnel. Items selected by the inspectors were subsequently reviewed through discussions with licensee personnel, documentation review, and field inspection to determine whether licensee actions specified in the OIs had been satisfactorily completed. The overall status of previously identified inspection findings was reviewed, and planned and completed licensee actions were discussed for those items reported below.

(Closed) Unresolved Item (79-02-02): ISI pump testing procedures do not establish reference values for pump head, flowrate or speed as required by IWP-3100. In the BVPS Inservice Inspection Program, for the period of October 1, 1981 to May 31, 1983, the testing requirements of Section XI, 1974 Edition through the Summer Addenda 1975 of the ASME Boiler and Pressure Vessel Code subsection IWP-ISI Testing of Pumps, are outlined in the existing Operational Surveillance Testing (OST) requirements for safety related pumps. The program recognizes that various plant conditions may preclude returning to the same point on the pump curve for each pump surveillance test. Consequently, use of the whole pump curve is allowed for certain pumps as referenced in the pump testing outline sections. The inspector reviewed a sample of the pump

surveillance OSTs (1.7.4, 1.7.5, 1.11.1, 1.13.1, 1.15.1) and compared their pump testing criteria to that contained in the ISI program and noted that the required base line reference conditions were established. This item is closed.

(Closed) Unresolved Item (79-02-04): ISI pump testing procedures do not specify or reference the required corrective actions of IWP-3230. IWP-3230, Corrective Actions, are referenced in Table IWP-3100-2 as a footnote. Additionally, the Shift Technical Advisors now review all completed Operational Surveillance Tests per TAG 2.0, ISI Program (ASME Section XI), and track the various parameters of safety related pumps as referenced in Table IWP-3100-2. This item is closed.

(Closed) Unresolved Item (79-02-05): ISI pump testing program does not include a summary listing of all pumps portraying current test status. DLC now maintains pump folders and a summary list of valves in the control room that tracks the testing status of each piece of equipment in relation to ISI commitments. The inspector reviewed these lists on a sampling basis and verified that they were current. The inspector had no further questions on this item.

(Closed) Unresolved Item (79-02-06): Valve stroke time comparisons not current for Category I valves. The Summary Valve Surveillance Log was reviewed by the inspector as well as a sampling of valve stroke surveillance tests to verify that test data was compared, and acceptance criteria and corrective actions were specified in accordance with IWV-3410, of the 1974 ASME Boiler and Pressure Code, Section XI. The inspector had no further questions on this item.

(Closed) Unresolved Item (81-08-12): DLC planned action and schedule pursuant to IEB 80-11, Masonry Wall Design, unresolved pending DLC modification schedule and NRC review. The licensee has now met all action item requirements of the subject bulletin as discussed in paragraph 10 of this inspection report. This item is closed.

(Closed) Unresolved Item (79-02-09): Valve testing procedures do not appear to address requirements of IWV-3410(e) for valves with fail-safe actuators. The inspector reviewed OST 1.1.10, Cold Shutdown Valve Exercise Test, Revision 35, and noted that valves with fail-safe actuators were now tested. Plant air is removed from the valve actuator and acceptable stroke times are verified for valve travel to its fail-safe position.

3. Plant Operations

a. General

Inspection tours of the plant areas listed below were conducted during both day and night shifts with respect to Technical Specification (TS) compliance, housekeeping and cleanliness, fire protection, radiation control, physical security and plant protection, operational and maintenance administrative controls.

-- Control Room
-- Primary Auxiliary Building
-- Turbine Building
-- Service Building
-- Main Intake Structure
-- Main Steam Valve Room
-- Purge Duct Room
-- East/West Cable Vaults
-- Emergency Diesel Generator Rooms
-- Containment Building
-- Penetration Areas
-- Safeguards Areas
-- Various Switchgear Rooms/Cable Spreading Room
-- Protected Areas

Acceptance criteria for the above areas include the following:

-- BVPS FSAR Appendix A, Technical Specifications (TS)
-- BVPS Operating Manual (OM), Chapter 48, Conduct of Operations
-- OM 1.48.5, Section D, Jumpers and Lifted Leads
-- OM 1.48.6, Clearance Procedures
-- OM 1.48.8, Records
-- OM 1.48.9, Rules of Practice
-- OM Chapter 55A, Periodic Checks - Operating Surveillance Tests
-- BVPS Maintenance Manual (MM), Chapter 1, Conduct of Maintenance
-- BVPS Radcon Manual (RCM)
-- 10CFR50.54(k), Control Room Manning Requirements
-- BVPS Site/Station Administrative Procedures (SAP)
-- BVPS Physical Security Plan (PSP)
-- Inspector Judgement

b. Operations

The inspector toured the Control Room regularly to verify compliance with NRC requirements and facility technical specifications (TS). Direct observations of instrumentation, recorder traces and control panels were made for items important to safety. Included in the reviews are the rod position indicators, nuclear instrumentation systems, radiation monitors, containment pressure and temperature parameters, onsite/offsite emergency power sources, availability of reactor protection systems and proper alignment of engineered safeguard feature systems. Where an abnormal condition existed (such as out-of-service equipment), adherence to appropriate TS action statements were independently verified. Also, various operation logs and records, including completed surveillance tests, equipment clearance permits in progress, status board maintenance and temporary operating procedures were reviewed on a sampling bases for compliance with technical specifications and those administrative controls listed in paragraph 3a.

During the course of the inspection, discussions were conducted with operators concerning reasons for selected annunciators and knowledge of recent changes to procedures, facility configuration and plant conditions. The inspector verified adherence to approved procedures for ongoing activities observed. Shift turnovers were witnessed and staffing requirements confirmed. Except as noted below, inspector comments or questions resulting from these daily reviews were acceptably resolved by licensee personnel.

(1) During reactor power ascension on July 11, 1982, the reactor operator noticed a swing in the pressurizer tank level, while in automatic level control. The controller was placed in manual and the malfunction investigated. Two leads in Process Control Rack 21, Board B terminals 4 and 5 were found reversed. They (leads 3C29 and 5C10) provided the T-average input to the pressurizer automatic level control system.

A review of completed calibration procedures and surveillance tests revealed that the system was last worked on per LCO 6-L459, Pressurizer Level Control Loop L-RC459 Calibration, Revision 4, performed June 24, 1982. Steps in this calibration procedure require a second qualified and knowledgeable individual to verify that lifted leads are properly returned to designated terminals, before returning the loop to service. The inspector noted that those steps were initialled by two Meter and Control Repairmen (MCR).

This incident was discussed with the Instrument and Control (I&C) Supervisor. The inspector was informed that discussions were held with the responsible MCRs, who attribute it to personnel error. The leads were subsequently placed in their correct position and the event was discussed with all MCRs during a safety meeting. Failure to properly return and verify the correct position of leads lifted as part of a maintenance procedure is a licensee identified violation not cited by NRC since it met the criteria of 10 CFR Part 2, Appendix C, Section IV(A).

Power Range Monitor NI41 was replaced while the reactor was shutdown on July 15-17, 1982. The reactor was restarted and Maintenance Surveillance Procedure (MSP) 2.03, Power Range Neutron Flux Channel N-NI41 Quarterly Calibration, Revision 15, performed. At about 40% power, prior to operational acceptance of NI41, the delta flux monitor (compares normalized current of NI41 detector A to B) indicated a negative value while the other three channels showed positive. The licensee found that the connector cables to detectors A and B had been reversed during performance of MSP 2.03.

The inspector reviewed the restoration section of MSP 2.03 and noted that a second knowledgeable and qualified individual was required to verify proper reconnection of the detector input plugs. Failure to correctly restore lifted leads and verify proper restoration is a violation (82-16-01) of the MSP and the BVPS OM Chapter 1.48.5, Section D, Jumper and Lifted Leads, Revision 15. The inspector discussed this recurrent problem with the Instrument & Control (I&C) Supervisor and expressed the concern that the licensee's corrective action in response to the finding of revised leads for the Pressurizer Level Control System discussed above did not prevent recurrence of problems with reversed leads. The I&C Supervisor acknowledged the inspector's concerns and stated that the two events would be discussed with the Meter and Control Repairmen during the next safety meeting. The inspector had no further questions at this time.

(2) The inspector witnessed the reactor startup on July 17, 1982 to verify adherence to approved procedures and appropriate technical specifications. No deficiencies were observed.

With reactor power about 14% at 1:40 a.m., July 18, 1982, a turbine trip and reactor trip occurred due to a high level in the "B" steam generator (S/G). The high level was attributed to response characteristics of the steam bypass control valves. The reactor was restarted. The inspector reviewed licensee actions and had no further questions on this event.

(3) The inspector was informed by the licensee that MSP 39.01, Battery No. 1 Test and Inspection, had not been successfully completed within the 92 day interval (due July 2, 1982) specified by TS 4.8.2.3.b, nor the 25% maximum extention allowed by TS 4.0.2. This was discussed with the Manager of Nuclear Safety and Licensing and the Electrical Maintenance Engineer. On June 27, 1982, two new cells (Nos. 6 and 55) failed to meet voltage parameters specified by the acceptance criteria of MSP 39.01 and the surveillance requirement of TS 4.8.2.3.b. A TS amendment (No. 54) had been previously submitted to the NRC for review and approval that would change the subject requirements to conform with IEEE Standard 450-1980 and Standard Technical Specifications. Confusion on this issue led to inaction, resulting in exceeding the testing interval. The licensee informed the inspector that the two cells did meet the above criteria, approved in TS Amendment 54 by the NRC on July 27, 1982, but was not able to produce the data due to misplacement of the MSP. Failure to maintain records of surveillance activities required by these TSs for at least five years, is a violation of TS 6.10.1d (82-16-02).

Revision 14 of MSP 39.01 incorporated changes to its acceptance criteria as specified by the new TS, and was successfully completed on August 2, 1982. Failure to successfully complete MSP 39.01 within the 92 day (plus 25% maximum extention) interval because two battery cells did not meet acceptance criteria that would be deleted under IEEE Standard 450-1980 and Standard Technical Specifications had no safety impact because the system was always able to perform its design function as proved during tests conducted on June 27 and August 2, 1982. This is a licensee identified violation and will not be cited by the NRC. The licensee representative informed the inspector that long-term corrective actions under consideration included highlighting about-due MSPs during plan-of-the-day meetings. This item is unresolved (82-16-03) pending NRC review of those actions.

OST 1.1.11, Safeguards Protection System Train A Test, Revision 34, performed July 9, 1982, could not test the feedwater pump trip circuits (DS8045 and DS8046) as scheduled because both pumps were shut down (test lights were not energized). Step 2 of the instructions requires posting a caution tag on any piece of equipment that cannot be tested due to clearances or plant conditions. The caution tag is to state that OST 1.1.11 must be performed on the equipment prior to return to service. The inspector reviewed the Caution Tag Log and verified that such tags were logged in and subsequently signed off when the feedwater pumps were started. The original copy of OST 1.1.11 run on July 9, 1982, was not updated to show the feedwater pump tests. A copy of the test conducted at the time of pump startup could not be located. Apparently, this copy had been discarded or misplaced. Technical Specification 6.10.1d requires

that records of surveillance activities required by Technical Specifications be retained for at least five years. This is a second example of a violation of TS 6.10.1d discussed above (82-16-02).

(4) Radioactivity increases of about 200 counts per minute in the steam generator (S/G) blowdown line (RM-BD-100) and subsequent chemistry sampling (I-133, Cs-138) indicated a tube leak of about 0.001 gpm in the C S/G on July 22, 1982. The leak rate has since increased to the range of 0.03-0.06 gpm. TS limits allow 500 gallons per day from one S/G. The inspector observed the licensee's initial response to the abnormal condition and conducted discussions concerning future plans. Temporary Operating Procedures (TOP) were prepared, approved and implemented by the licensee to address the leak. Included are:

(a) TOP 82-42, Installation and Operation of Temporary Blowdown Demineralizers, approved July 23, 1982, to purify water to quality levels required for blowdown to the Hotwell.

(b) TOP 82-43, Temporary Blowdown Demineralizer Replacement, approved July 27, 1982.

(c) TOP 82-44, Steam Generator Tube Leakage, approved July 29, 1982, to provide operational guidance until incorporation into the Operating Manual.

(d) TOP 82-46, Emergency Shutdown - Cooldown from Hot Standby to Hot Shutdown with a Steam Generator Tube Leak, approved August 4, 1982.

The inspector reviewed the Chemistry Department's data and leak rate calculations. The inspector noted the formula used to calculate the leakage from short half-life radioisotope concentrations in the secondary side was not part of an approved Chemistry procedure subject to Onsite Safety Committee (OSC) review and approval. This was brought to the attention of the Reactor Control Chemist and Chief Engineer. The licensee representatives informed the inspector that a procedure would be prepared and presented to the OSC. This item is unresolved (82-16-04) pending such approval. The inspector will continue to monitor the S/G tube leak rates on a daily basis.

(5) A hose connection failed on the S/G temporary demineralizer, spilling low level radioactive resin and water in the S/G Blowdown Room at about 10:30 a.m., August 3, 1982. The connection failed due to overpressurization when component cooling water (CCR) was isolated from the S/G blowdown heat exchangers, without isolating the blowdown. No personnel contamination or airborne activity resulted. The inspector monitored portions

of the decontamination work. The licensee reviewed the incident with operations personnel and installed switch covers over the CCR isolation valve controls that are labeled to remind personnel of the new temporary demineralizer system arrangement. The inspector had no further questions.

(6) ESF System Safety Verification

The inspector performed a walk down of accessible portions of the Low Head Safety Injection System on July 27 and August 11, 1982. Inspected items included: valve position; local and remote position indication; security locks; power availability and breaker alignment. Portions of the High Head Safety Injection System; Quench Spray System and Recirculation Systems were also checked on July 26-27, 1982. No deficiencies were identified.

c. Plant Security/Physical Protection

Implementation of the Physical Security Plan was observed in the areas listed in paragraph 3a above with regard to the following:

-- Protected area barriers were not degraded;

-- Isolation zones were clear;

-- Persons and packages were checked prior to allowing entry into the Protected Area;

-- Vehicles were properly searched and vehicle access to the Protected Area was in accordance with approved procedures;

-- Security access controls to Vital Areas were being maintained and that persons in Vital Areas were properly authorized;

-- Security posts were adequately manned, equipped, and security personnel were alert and knowledgeable regarding position requirements, and that written procedures were available; and

-- Adequate lighting maintained.

No inadequacies were observed.

d. Radiation Controls

Radiation controls, including posting of radiation areas, the conditions of step-off pads, disposal of protective clothing, completion of Radiation Work Permits, compliance with Radiation Work Permits, personnel monitoring devices being worn, cleanliness of work areas, radiation control job coverage, area monitor operability (portable and permanent), area monitor calibration, and personnel frisking procedures were observed on a sampling basis.

(1) During a plant tour, the inspector was approached by an individual who claimed that a Radcon foreman had signed out a Chemox and lent it to an unqualified individual. This was immediately discussed with the Radcon Supervisor, who provided the inspector with previously prepared documentation on the subject. The Radcon Foreman did sign the Respiratory Issue Log and issued the Chemox to a qualified QC inspector per instructions from the Nuclear Shift Supervisor. The inspector reviewed training records and verified that the QC inspector was qualified for Chemox use at the time of issue (July 5, 1982). The only irregularity noted was that the Radcon foreman should have sent a signed memo to the attendant requesting a Chemox be issued to the QC inspector. This was corrected. The inspector had no further questions at this time.

(2) On August 9, 1982, the inspector observed an indivdual at the Primary Auxiliary Building exit point frisker station with contaminated shoes (about 200 cpm above background). The person told the inspector that he had been working on the solid waste filter job. The inspector immediately contacted the Radcon Supervisor and requested surveys be taken of the area to determine the contamination source. The licensee subsequently identified the solid waste area and PAB 735 ft. elevation walkways as being contaminated. Radcon procedures to control and decontaminate the affected areas were implemented.

Investigation revealed poor health physics practices as the cause. On August 6, 1982, maintenance was performed on solid waste filter No. 3 (SW-FL-3). Upon exiting the 722 ft. elevation filter cubicle, personnel removed the first layer of their contaminated anti-contamination clothing (anti-Cs) and left them on top of the enclosure wall instead of bagging them before descending on a ladder to the uncontaminated area. These individuals then followed acceptable Radcon practices for change out. On August 9, 1982, a second work party entered the filter cubicle by way of the same ladder with the contaminated clothing on top. By this time, the contamination had spread to the ladder and step-off-pad below. A pre-work survey would have detected this condition. When the second work party exited the area and went to the nearest frisker station (not at job site due to high background readings), they tracked contamination through the walkways. Before action could be taken, other personnel entered Solidwaste, contaminated their shoes, and exited the area.

The inspector reviewed air sample data of the work area and whole body count data for the contaminated personnel. Internal levels were about 5 nano-curies; below reporting requirements. The licensee held extensive discussions with all personnel involved. Several modification requests were submitted that address ventilation, access ways and installed equipment for fast decontamination. This is unresolved (82-16-05) pending review of licensee actions to limit any future solidwaste contamination problems.

e. Plant Housekeeping and Fire Protection

Plant housekeeping conditions including general cleanliness conditions and control of material to prevent fire hazards were observed in areas listed in paragraph 3a. Maintenance of fire barriers, fire barrier penetrations, and verification of posted fire watches in these areas were also observed. No violations were observed by the inspector during plant tours.

4. Radwaste Operations

Unsampled low level liquid waste was accidentally released from steam generator (S/G) drain tank 7B (LW-TS-7B) on July 23, 1982, while Radioactive Waste Discharge Authorization No. 1901 was in progress for LW-TK-7A. Upon discovery, the discharge was terminated and LW-TK-7B sampled. Results indicated that all activity levels were within the administrative guidelines authorized by RWDA-1901. Initial licensee investigation established that LW-TK-7B was filled to the high level alarm point while tank 7A was being discharged. The Nuclear Shift Supervisor authorized continued filling to the high-high alarm point. This alarm point had not been reached when operators observed a level increase in tank 7A (caused by 7B reaching the overflow window) and immediately terminated the discharge. Failure to sample and analyze liquid waste before release and the simultaneous discharge of two liquid waste tanks is a licensee identified violation of Radcon Manual, Chapter 3, Procedure 6.5, Radioactive Waste Discharge Authorization-Liquid, Issue 2.

On July 27, 1982, a valving error diverted a portion of the S/G demineralizer outlet flow to LW-TK-7A while tank 7B was being discharged per RWDA No. 1913. Unsampled liquid from the 7A tank overflowed and was discharged with the 7B tank, contrary to Radcon Manual Chapter 3, Procedure 6.5. The discharge was terminated upon discovery and tank 7A contents were sampled and analyzed. Using the most limiting isotopic concentrations of each tank, the licensee determined that MPC factors of 7-8 before dilution were 0.02 after dilution and within limits. Administrative concentration guidelines of 1 E-7 micro curies/ml at the outfall were exceeded by about 28%. No NRC release limits were violated.

The incident investigation of the first release event identified an error in the way the tank level transmitters were calibrated. A generic calibration procedure was used for both tanks. The high-high alarm levels were set to annunciate at approximately one-half foot under the overflow window. The transmitter, with a 0-20 foot range, tapped into the tanks at one foot off their bottom. This was not accounted for by the Meter and Control Repairman during calibration; hence, the level signal to the alarms were one foot lower than actual. The situation was aggrevated because there is no remote level indication in the Control Room. Before the second event, the licensee directed that discharging be stopped upon receipt of only the high level alarm. Though it annunciated, tank 7A overflow was discharged. Failure to take adequate corrective action after the first incident that led to an unauthorized radioactive liquid waste release is a violation (82-16-06) of the BVPS QA Manual, Procedure OP-13, Control of Nonconforming Items, Revision 5, May 1, 1982 and Nuclear Division Directive No. 4, Corrective Action System, Issue 1, October 12, 1981.

5. In Office Review of Licensee Event Reports (LERs)

The inspector reviewed LERs submitted to the NRC:RI office to verify that the details of the event were clearly reported, including the accuracy of the description of cause and adequacy of corrective actions. The inspector determined whether further information was required from the licensee, whether generic implications were indicated, and whether the event warranted onsite followup. The following LERs were reviewed:

--	LER 82-21/03L *	Outside Recirculation Pump (RS-P-2A) Mechanical Seal Leakage
--	LER 82-22/03L *	Two Component Cooling Water Pumps (CCR-P-B,C) Inoperable
--	LER 82-23/03L *	Inoperable Nuclear Power Range Monitor (NI-41)
--	LER 82-24/03L *	Two Component Cooling Water Pumps (CCR-P-B,C) Inoperable
--	LER 82-25/03L	Control Rod F-10 Position Deviation Greater Than Twelve Steps
--	LER 82-26/03L	Subcooling Monitor Inoperable From Erratic Thermocouple Input
--	LER 82-27/03L	Containment Vacuum Pump (CV-P-1A) Failed to Start

No unacceptable conditions were identified.

6. Onsite LER Followup

The inspector reviewed the licensee's actions for the following LERs:

-- LER 82-21: This item is discussed in NRC Inspection Report 50-334/82-13. The licensee has requested the vendor to investigate the cause of the seal bellows binding, and is tracking this response on the Corrective Action Item Tracking System.

-- LER 82-22: Technical Specification 3.7.3.1, Component Cooling Water System, requires two of the three pumps to be operable during operation in Modes 1-4. The A and C component cooling water (CCR) pumps met this obligation with the B CCR pump out-of-service for maintenance. During reactor startup on July 7, 1982, high temperature alarms were received for the C CCR pump bearing. The licensee shed non-safety related loads from the CCR system and shutdown the C pump. Repairs on the B pump were expedited, restoring the second CCR loop to operability within 16 hours. The inspector observed portions of the pump surveillance test performed prior to declaring the B loop operable and verified compliance with the TS action statements.

* Denotes those reports selected for onsite followup.

-- LER 82-23: The N-41 power range monitor began to spike periodically during a load change and was declared inoperable on July 10, 1982. During the period of time that N-41 was out-of-service, the inspector verified that the applicable action statements of TS 3.3.1.1, Reactor Instruments, were adhered to in that: (1) the inoperable channel was placed in the tripped position, (2) the minimum number of channels were operable by review of completed surveillance tests (MSPs) and visual channel checks, and (3) either thermal power was limited to 75% with the power range monitor trip setpoints set at 85% or the quadrant power tilt ratio was monitored as within limits every 12 hours. The reactor was subsequently shut down on July 19, 1982 to repair N-41. Water was found in the cable and connector, which were replaced along with the detector. The licensee determined that the water source was in-leakage through the Refueling Cavity Seal that occurred during the last refueling outage.

-- LER 82-24: This is the third similar event involving two inoperable component cooling water (CCR) pumps (see LER 81-103 and LER 82-22). The C pump had been previously shutdown for an extended period of time, when the B pump bearing failed on July 18, 1982. The inspector verified compliance with the TS action statement and observed portions of the pump surveillance test, OST 1.15.2, Reactor Plant Component Cooling Water PUmp (CCR-P-1B) Monthly Test. The licensee attributed the failure mechanism to a pump/motor misalignment which caused the bearing to shift and block oil flow. The pump vendor has been contacted to investigate this recurring problem. 10CFR50, Appendix B, Criteria XVI, Corrective Actions, requires the licensee to establish the cause of failures, malfunctions, or deficiencies that are adverse to quality and take corrective action to preclude repetition. This item is unresolved (82-16-07) pending licensee investigation of failure modes and implementation of the appropriate corrective action.

7. Maintenance Activities

The inspector observed and reviewed selected maintenance activities to verify compliance with technical specifications (reportability and limiting conditions for operation in applicable mode), administrative and maintenance procedures, appropriate industrial codes and standards, equipment clearances, QA/QC involvement, jumper use, fire prevention controls, proper radiological controls, and equipment testing prior to returning to service. The following activities were included:

a. Corrective Maintenance Procedure 1-2NI-N41-42-43-44-5I, Power Range Neutron Flux Detector Replacement, Revision 2, July 16, 1982.

b. MSP 6.39, T-RC422 Delta T T Avg Protection Instrumentation - Channel II Calibration, Revision 8, performed to trouble shoot RCS Loop B overtemperature delta T for rod stop/turbine runback alarm on August 2, 1982.

8. Surveillance Activities

Portions of various surveillance tests were observed to verify that: (1) technical specification test frequencies were met, (2) the procedure was followed, (3) testing was performed by qualified personnel, (4) LCOs were being met, and (5) system restoration was correctly accomplished following the tests. The following activities were witnessed by the inspector:

a. OST 1.3.1, Incore Moveable Detector System Normalization, Revision 7, performed July 12, 1982.

b. OST 1.15.2, Reactor Plant Component Cooling Water Pump (CCR-P-1B) Monthly Test, Revision 12, performed July 15 and 20, 1982.

c. MSP 2.05, Power Range Neutron Flux Channel NI-43 Quarterly Calibration, performed July 22, 1982.

d. MSP 4.02, Core Subcooling Monitor Calibration, Revision 2, in progress on July 28, 1982.

e. OST 1.24.2, Motor Driven Auxiliary Feed Pump Test (FW-P-3A), Revision 20, performed July 29, 1982.

f. OST 1.11.6, ECCS Flow Path & Valve Position Check (L.H.S.I Loop A), Revision 33, performed August 13, 1982.

9. Reactor Startup Testing

The inspector witnessed selected portions of reactor startup testing per BVT 1.3-2.2.1, Initial Approach to Criticality After Refueling, Issue 1, and BVT 1.3-2.2.2, Core Design Check Test, Issue 1, conducted on July 8-12, 1982. Test conduct and data gathering were observed to verify adherence to the test procedures. Data results were reviewed and compared with acceptance criteria specified in the BVTs.

Test results from the Hot Zero Power (HZP) All Rods Out (ARO) flux map indicated a major axis quadrant power tilt of 4.8%; initial design estimates were for less than 4%. Measured peaking factors ($F_{\Delta H}$, F_{XY}) were within their predicted tolerances. Additionally, the critical boron concentration at various control rod insertions was outside the 50 ppm upper predicted value.

The inspector held discussions with the Reactor Engineer and Manager of Nuclear Safety and Licensing concerning the apparent anomalies. DLC had contacted the fuel vendor (Westinghouse Nuclear Fuel Division), and was advised to complete another ARO flux map at 20% power. The results of this second analysis were acceptable. The predicted HZP ARO

critical boron concentration was revised to account for actual end of life Cycle 2 burnup, which had been estimated low because of the early shutdown. The above test changes were reviewed and approved by the Onsite Safety Committee during meeting BV-OSC-78-22. The inspector had no further questions.

10. IEB 80-11 - Masonry Wall Design

Licensee actions taken in response to this bulletin were previously inspected and are discussed in NRC Inspection Report 50-334/81-08. The re-evaluation of masonry wall design adequacy and justification of applied acceptance criteria were submitted to the NRC for review and evaluation. Based on NRC review of the Test Evaluation Report provided by Franklin Research Center, the Division of Licensing has concluded that DLC has fully implemented action items 2 and 3. This bulletin is closed.

11. Inspection of TMI Action Plan Requirements

The inspector reviewed the documentation and inspected selected installed equipment associated with the following plant modifications to verify that the design changes had been properly reviewed, approved and controlled in accordance with adequate procedures, that test results had been reviewed by appropriate personnel, that procedures and drawings had been changed as necessary, and that personnel had received appropriate training. A comparison of the design changes to NUREG 0737 criteria and licensee commitments was conducted to verify that the modification met these requirements.

The following design changes/modifications were reviewed:

-- II.B.1.2 - Install Reactor Coolant Systems (RCS) Vents

The following documentation was reviewed: DCP 295 Design Concept, Final Safety Evaluation Report dated June 4, 1982 and reviewed by OSC meeting 64-82, RCS drawings, and the RCS Valve List (Procedure 1.6.3). Based on this review it was determined that the system design and installation conformed with NUREG 0737 Criteria and that the RCS Valve list and RCS drawings had been changed to reflect this installation of the RCS Vent System. However, because of the requirement for a pre-implementation review of system operating procedures by NRR, the system cannot be made operable except in Modes 5 and 6. The inspector verified that the system was made inoperable by shutting and Red Tagging manual valves between the RCS (pressurizer and reactor vessel) and the solenoid operated (SOV) vent valves (clearance No. 479764) and by placing "Out of Service" stickers (82107-82111) on the six key operators for the SOV vent valves, as required by procedure 1.6.4.F, "Filling and Venting the Reactor Coolant System," Revision 15. The system operating procedure is undergoing OSC review prior to forwarding to NRR. Personnel training and necessary operating and surveillance procedures will be implemented following NRR approval of the operating procedure. Followup in this area will be conducted in a subsequent inspection. (82-16-08).

-- II.B.2.2.B - Modify Plant Shielding

The inspector reviewed NUREG 0737 Item II.B.2 and licensee letters to NRR dated June 30, 1981, December 30, 1981, and April 28, 1982 which described the shielding evaluation and modifications to be completed as a result of this study. The following design changes and associated documentation were reviewed.

-- DCP 356 - Install Reach Rods for Hydrogen Recombiner Inlet and Outlet Valves

SER reviewed by OSC in meeting 58-82 with operational acceptance of the completed modification effective June 10, 1982.

-- DCP 362 - Hydrogen Recombiner Control Panel Shielding Installation

SER reviewed by OSC in meeting 31-82 with operational acceptance of the completed modification effective May 20, 1982.

-- DCP 363 - Install Reach Rod on 1A-90, Instrument Air Cross-Connect Valve

SER reviewed by OSC in meeting 155-80 with operational acceptance of the completed modification effective November 16, 1980.

A tour of the safeguards penetration areas confirmed that the installation of the reach rods and shielding had been completed in accordance with the design change packages. The inspector verified that Operations Manual Chapter 50, Section 1.50.4 had been revised to reflect the location from which the modified valves are now operated. The inspector had no further questions in this area.

-- II.F.1.3 - Install Containment High Range Monitors

The inspector reviewed documentation associated with the portion of DCP-303 which installed high range containment area radiation monitors. DCP-303, "Containment and Effluent Radiation Monitors," had received OSC review in meeting 72-82 and had been completed with operational acceptance made on July 1, 1982. An inspection of the new Rad Monitor Panel No. 7 which contains the two readout meters and recorders associated with this modification verified that the instrumentation was functional and had been calibrated. The environmental qualification of the Control Room instrumentation has not been completed. In a letter to NRR dated March 19, 1982, the licensee requested a deviation from environmental qualification of this equipment. A response has not yet been received. This will be reviewed in a subsequent inspection. (82-16-09).

-- I.A.1.3(2) - Minimum Shift Crew

Licensee Station Administrative Procedure, Chapter 1, "Administrative Controls and General Instructions," Revision 0, April 30, 1982, and Operating Manual Chapter 48, Section 2, "Organization and Responsibilities of Operating Personnel," Revision 18, May 21, 1982, were reviewed and compared to criteria in NUREG 0737, Pages 3-9. No inadequacies were identified.

12. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable, items of noncompliance or deviations. Six unresolved items were identified and are discussed in paragraphs 3, 5 and 10 of this report.

13. Exit Interview

Meetings were held with senior facility management periodically during the course of this inspection to discuss the inspection scope and findings. A summary of inspection findings was also provided to the licensee at the conclusion of the report period.