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

REGION I

Report No. 50-334/80-12

Docket No. 50-334

License No. DPR-66 Priority -- Category C

Licensee: Duquesne Light Company

435 Sixth Avenue

Pittsburgh, Pennsylvania 15219

Facility Name: Beaver Valley Power Station, Unit 1

Inspection At: Shippingport, Pennsylvania

Inspection Conducted: April 20 - May 31, 1980

Inspectors: D. A. Beckman, Senior Resident Inspector — 7/23/80 date

J. D. Hegner, Resident Inspector — 7/23/80 date

_____ — _____ date

Approved by: E. C. McCabe, Jr., Chief, Reactor Projects Section No. 2, RO&NS Branch — 7/23/80 date

Inspection Summary:
Inspection on April 20 - May 31, 1980 (Report Number 50-334/80-12)
Areas Inspected: Routine inspections by the resident inspectors (79 hours) of licensee actions on previous inspection findings; plant operations; IE Bulletin followup; in-office review of licensee event reports; licensee event followup; apparent gaseous waste tank release; and potential recirculation spray heat exchange integrity problem.
Results: No items of noncompliance were identified.

Region I Form 12
(Rev. April 1977)

DETAILS

1. Persons Contacted

R. Balcerek, Nuclear Engineering and Refueling Supervisor
R. Burski, Senior Compliance Engineer
S. Fenner, QC Supervisor
K. Grada, Acting Operations Supervisor
R. Hansen, Maintenance Supervisor
R. Prokopovich, Reactor Engineer
J. Sieber, Superintendent, Licensing and Compliance
H. Siegel, OEG Supervisor
H. Thomas, Assistant Supervisor, OEG
P. Valenti, Station Engineer
J. Werling, Station Superintendent
H. Williams, Chief Engineer

The inspectors also interviewed other licensee personnel during the course of the inspection.

2. Licensee Action on Previously Identified Inspection Findings

The NRC Outstanding Item (OI) List was reviewed with responsible licensee personnel. Items selected by the inspectors were subsequently reviewed through discusssions with licensee personnel, documentation review, and field inspection to determine whether licensee actions specified in the OIs had been satisfactorily completed. Outstanding items are addressed below and in paragraph 3. The overall status of previously identified inspection findings was reviewed, and planned and completed licensee actions were discussed for those items not reported below.

(Closed) Infraction (80-01-06): Failure to Follow Radiochemistry Sample Procedures. The inspector reviewed the actions taken by the licensee as described in a DLC letter of April 3, 1980, including: Revision 8 to the BVPS Chemistry Manual, Chapter 3, which provided revised sample alignment instructions; Chemistry Manual Change Notice No. 80-15, dated March 26, 1980, which provided interim sample alignment instructions to accommodate portions of the sampling system being out-of-service for outage related work; and, a Chemistry Supervisor's memorandum to all chemists dated February 27, 1980 which provided guidance for procedure compliance. The inspector confirmed, via signed acknowledgement sheet, that all chemists had reviewed the above memorandum. Additionally, the Chemistry Supervisor has observed the performance of each chemist by following the extraction and analysis of samples via the above procedure revisions.

(Closed) Unresolved Item (80-09-08): Use of Caution Tags for Off Normal System Alignments that Extend Past Shift Turnover. Review of control room practices had indicated that while valve manipulations were generally

logged in one or more of the control room narrative logs, no single, consistently implemented mechanism existed to ensure that temporary system configurations that deviate from normal system arrangement were carried from shift to shift and that the equipment was returned to normal at an appropriate time. The inspectors informed licensee personnel that such practices had an unacceptably high potential for error and requested that the licensee review the applicable procedures for possible revision. As a result of that review, additional guidance was promulgated by DLC.

The inspectors reviewed Operations Manual Change Notice 80-66, dated May 2, 1980 revising BVPS Operating Manual (OM) Chapter 48, Section 7 to require that a Caution Tag be immediately installed at clearance points or control switches to assure continuity of information to relieving shifts whenever verbal communications are used to establish a set of test conditions. The inspectors verified placement of the Change Notice in controlled copies of the Operations Manual, that control room personnel were aware of the change, and the the revised procedure was being adhered to. The inspectors had no further questions.

3. IE Bulletin (IEB) Followup - IEB 79-01B, Environmental Qualification of Class IE Equipment

NRC has established a special Task Force to perform an overall review of licensee activities pursuant to the subject IEB. On May 8-9, 1980, a Task Force member conducted an onsite review of selected equipment identified by the licensee's partial response to the IEB dated March 31, 1980. The submittal consisted of a Master List of systems/components required to function under postulated accident conditions. Listed components were selected from the following systems for inspection of actual installation configuration: Component Cooling Water; Chemical Volume and Control; and Main Steam.

The following observations were made by the Task Force member during containment tours while accompanied by licensee personnel:

a. An ASCO solenoid valve associated with throttle valve TV-CC-105-E3 was found to be internally disassembled in that the solenoid retaining clip had fallen from the core guide.

b. Throttle valve TV-CC-107-D1 was identified as having an unqualified 700 Series NAMCO position indicating limit switch.

c. Main steam flow transmitters FT-MS-474/475; -484/485; -494/495 appeared to have unqualified installations which might allow the transmitter to be subject to internal exposure to post-accident environments. The postulated access path was through unsealed conduit connecting the flow transmitters to junction/terminal boxes which had previously been vented to provide overpressure protection.

The Task Force member stated that the lack of any seals would allow access for steam/humidity to transmitter internals during both normal operating and accident conditions.

d. Motor operated valve MOV-CH-310, which the licensee had identified as being required to be operable during post-accident conditions, was found to be below containment flood level. The Task Force member observed that the valve had an unsealed motor conduit and identified this finding to accompanying licensee representatives.

The Task Force member also observed a number of valves on the 692 elevation within containment which had unqualified limit switches but was unable to determine at that time whether the valves observed appeared on the licensee's Master List. These valves were identified to accompanying licensee personnel for followup.

These observations were brought to the attention of the licensee both during the containment tours and during the exit interview held May 9, 1980. The licensee's position on each of the findings was requested and is presented below:

a) The deficiencies associated with the ASCO solenoid valve on TV-CC-105-E3 were corrected. A licensee investigation revealed that replacement of unqualified solenoid valves with acceptable components was being completed as part of Design Change Package 278. The valve in question has been successfully tested. However, the licensee determined that during replacement of unqualified valves with qualified components, two other valves with similar conditions had been discovered and corrected.

Discussion between IE:HQ personnel and the vendor determined that an improperly installed solenoid retaining clip might still allow the valve to be successfully tested depending on the orientation of the component. The licensee has reinspected all ASCO solenoid valves. No additional discrepancies were identified.

b) The position indicating limit switch on TV-CC-107-D1 was a 700 Series NAMCO. In response to IE Bulletin 78-04, Environmental Qualification of Certain Stem Mounted Limit Switches Inside Reactor Containment, the licensee had replaced the then unqualified limit switches (NAMCO 2400 Series) with what were believed to be qualified switches (NAMCO Series 180, 700 and 740). The licensee has committed to equipping components having 700 series limit switches with qualified models prior to start-up, subject to the availability of replacement switches. Specific switches to be replaced are on valves TV-CC-107-A, -B, -C, -D1, -E1 and TV-CC-110-E3.

c) The licensee stated that in compiling the Master List, the broadest possible interpretation had been applied to the definition of the classes of equipment required for accident operation and that certain items may subsequently be deleted if the item is determined not to be required to respond to an accident, or achieve safe shutdown, or not identified in an emergency operating procedure. The licensee no longer relies upon the identified MS flow transmitters for any protection function. A new solid state steam line break protection system is to be installed during the current outage. It does not utilize MS flow as an input. The licensee has redirected its A/E to evaluate the qualification of all equipment inside containment and provide a plan of action to deal with those components found to be unacceptable and provide this information to the licensee by July 7, 1980. The licensee has also directed its A/E to assure that installation of components is considered as part of its qualification.

However, with regard to those transmitters that do not provide protection functions but were found to be subject to internal exposure to post-accident environments, the licensee, based upon discussions with the NSS supplier, does not intend to install seals in order to preclude entry of steam/humidity into transmitter internals.

d) The licensee has requested its A/E to provide a plan of action prior to June 30, 1980 for MOV-CH-310. The licensee agreed to provide NRC with implementation dates and the action plan, when available.

The matters above and the licensee's other activities in response to the IEB will be subject to continuing review by NRC:RI and the special Task Force (79-BU-01B).

4. Review of Plant Operations

a. General

Inspection tours of selected plant areas were conducted on the dates noted during the day shift with respect to housekeeping and cleanliness, fire protection, radiation control, physical security and plant protection, operational and maintenance administrative controls, and Technical Specification compliance.

Acceptance criteria for the above areas included the following:

-- BVPS FSAR Appendix A, Technical Specifications

-- BVPS Operations Manual, 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

-- BVPS Operations Manual, Chapter 55A Periodic Checks - Operating Surveillance Tests

-- BVPS Operations Manual, Chapter 54 Station Logs

-- BVPS Maintenance Manual, Chapter 1 Conduct of Maintenance

-- Section J Housekeeping

-- Section O Calibration

-- BVPS Radcon Manual, Various Sections

-- SAD 25 Housekeeping and Cleanliness Procedure

-- 10 CFR 50.54(k) Control Room Manning Requirement

-- BVPS Physical Security Plan

-- Inspector Judgment

b. Areas Toured

-- Control Room (May 20)
-- Primary Auxiliary Building, except High Radiation Areas and Loose Surface Contamination Areas (April 25; May 21)
-- Service Building (April 25; May 21)
-- Containment Building, High Radiation Areas (May 21)

The inspectors toured the Control Room on a daily basis to review logs and records and conduct discussions with operators concerning reasons for selected lighted annunciators, knowledge of recent changes to procedures, facility configuration and plant conditions.

c. Observations

1) Control Room Instrumentation Conformance with Technical Specifications. Control Room monitoring instrumentation was observed to verify that instrumentation and systems required to support Mode 5 operations were in conformance with Technical Specification Limiting Conditions for Operations. The following instrumentation/ indications were observed with respect to the LCOs indicated:

--	Boric Acid Flowpath	TS 3.1.2.2
--	Boric Acid Transfer Pumps Operability	TS 3.1.2.5
--	Boric Acid Storage Tank Level and Temperature	TS 3.1.2.7
--	Reactor Coolant System Boron Concentration	TS 3.9.1
--	Residual Heat Removal Flow	TS 3.9.8
--	Radiation Monitor Operability	TS 3.3.3.1
	- RM-LW-104 - RM-RW-100 - RM-VS-104 A/B - RIS-VS-106 - RM-VS-103 A/B	
--	AC/DC Electrical System Availability and Distribution	TS 3.8.1.2; 3.8.2.2; and 3.8.2.4

2) Radiation Controls

Radiation controls including posting of radiation areas, the conditions of step-off pads, disposal of protective clothing, filling out 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 in the following areas:

-- Primary Auxiliary Building (April 25; May 21)

-- Containment Airlock Area (May 21)

-- Containment (May 21)

The following Radiation Work Permit (RWP) was reviewed for completeness:

-- RWP 6572 PAB Safeguards All Elevation Non-High Rad Areas

3) Plant Housekeeping

Plant housekeeping conditions including general cleanliness conditions and control of material to prevent fire hazards were observed in areas listed in paragraph b. Maintenance of fire barriers, fire barrier penetrations, and verification of posted fire watches in these areas was also observed.

4) Control Room Manning

Control Room manning was observed on the dates noted in paragraph b. above and during other periodic Control Room visits.

5) Surveillance Tests

The inspectors reviewed completed surveillance tests available during Control Room tours to verify that surveillance tests were being completed, that the results were being reviewed according to approved procedures, and appropriate corrective actions were identified if necessary. The following records of Operating Surveillance Tests (OST) were reviewed:

-- OST 1.48.1 Mode 5 and 6 ESF Train Operability, Issue 1, performed May 21, 1980

-- OST 1.36.2 Diesel Generator No. 2 Monthly Test, Revision 16, performed April 29 and May 27, 1980

6) Plant Security/Physical Protection

Implementation of the physical security plan was observed during inspection of areas listed in paragraph b. 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; and,

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

No items of noncompliance were identified.

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

The inspectors 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 action. 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:

Report Number	Event Date	Title
*80-25/01T	April 15, 1980	Weld Deficiencies on RWST
*80-26/03L	April 22, 1980	Inadvertent Liquid Waste Release
80-27/03L	April 30, 1980	EDG River Water Check Valve Damage
80-29/03L	April 9, 1980	Type C Leak Rate Test Failure
*80-30/01T	May 19, 1980	Loss of Diesel Driven Fire Pump
*80-31/01T	May 21, 1980	HPV-216 Leak on RHR System

During review of LER status, the inspectors noted that a followup report to LER 80-03/01T, Potential Overstress on Hanger H-95, dated January 24, 1980 had not been submitted as required by TS. The licensee was informed of the apparent omission and a followup report was submitted. The licensee informed the inspector that the oversight had resulted from reassignment of responsibilities for preparation and issuance of LERs to an individual who had not previously been involved in such activities. This assignment was made at approximately the same time the subject followup report was due without the newly assigned individual recognizing the need for a submittal. The individual has subsequently become increasingly familiar with the administration of the reports. On the basis of the above and the apparently isolated nature of the oversight, no items of noncompliance were identified.

6. Onsite Licensee Event Followup

For those LERs selected for onsite followup (denoted by asterisk in paragraph 5), the inspector verified that the reporting requirements of the Technical Specifications and Procedures SAD 14 and SAD 23 had been met, that appropriate corrective action had been taken or planned, that the event was reviewed by the licensee as required by Technical Specifications and Procedure SAD 21, and that continued operation of the facility was conducted in accordance with Technical Specifications and did not constitute an unreviewed safety question as defined in 10 CFR 50.59(a)(2). The following findings relate to the LERs reviewed onsite:

* Reports selected for onsite followup.

a) Unplanned Liquid Waste Release April 16-22, 1980 (LER 80-26)

1) Description of Event

On April 22, 1980 the Resident Inspector was informed by the Shift Supervisor at 0615 that an unplanned and unmonitored liquid waste discharge appeared to have been taking place since April 16, 1980. Initial estimates by the licensee indicated that approximately 4000 gallons of low activity level liquid waste had been discharged to the Ohio River during that period. The source of the discharge appeared to be waste water stored and being recirculated through Steam Generator Drain Tanks (LW-TK-7A/B) and Liquid Waste Evaporator Test Tanks (LW-TK-5A/B). Since it had not been the licensee's intention to discharge all the referenced tanks, specific activity samples for all tanks were not available; however, a sample taken from LW-TK-5A prior to recirculation on April 22, 1980 indicated gross activity levels of 3.25E-5 uCi/cc which, with proper authorization, would have been within radioactivity limits acceptable for discharge.

The release was discovered by Control Room operators at 0300 hours after the system had been aligned to recirculate LW-TK-5A according to the procedure of the BVPS OM Section 1.17.4.E.6, Revision 7. Operators noted that the discharge flow from the Liquid Waste Evaporator Test Tank Pump (LW-P-9A) indicated about 2 gpm more on the discharge line flow recorder (FR-LW-104) than experience had shown to be its nominal flow rate. Control Room operator comparison of indicated flow rate with decreasing tank levels also revealed a discrepancy in that the flow rate was greater than could be accounted for by discharged tank volumes. Upon securing the pump, operators noted that the recorder pen did not return to zero, but continued to indicate 1-2 gpm flow.

Examination of the strip chart by the licensee and inspector determined that the flow condition had existed since April 16, 1980 with interruptions only during periods of time when the Liquid Waste Radiation Monitor (RM-LW-104) had been isolated for maintenance. Operators reverified valve positions required by the referenced procedure on April 22 and determined that a valve (1LW-17) was in its open position contrary to the procedure. In combination with known leaky outlet valves on the Steam Generator Drain Tanks, this condition resulted in inadvertent pressurization of the liquid waste discharge line. Other isolation valves downstream of 1LW-17, specifically FCV-LW-104-2 and TV-LW-105 were verified closed, but were also found to be leaking by their valve seats.

The licensee notified the NRC Operations Center of the event at approximately 0630 via the NRC Emergency Notification System.

The licensee implemented the Emergency Preparedness Plan, Section IIA-1, Notification of Public Interest Call List, Revision 5, which notified affected water use facilities downstream of the power plant, as well as local and state government agencies of an unplanned or uncontrolled release of radioactive material.

Subsequent licensee analysis of the liquid waste being discharged revealed cobalt-60 activity of 3.5E-6 uCi/cc and cesium-137 activity of 8.0E-7 uCi/cc. This represented 0.0058% and 0.0010%, respectively, of the Maximum Permissible Concentrations (MPC) allowed by 10 CFR 20 Appendix B. Similarly, through evaluations of liquid waste tank levels logged on Station Logs L3-5 on April 16 through 21 and compared to the Nuclear Control Operator's Logs S4-6 for the same period, the licensee concluded that no more than 4,250 gallons of liquid waste had been discharged during the event.

2) Initial Followup

Initial concern focused on determining the sequence of events preceding discovery of the discharge on April 22, 1980. Review of licensee records and discussions with licensee personnel provided the following sequence of events:

Date	Time	Event
April 16, 1980	023C-0600	Control Room operators attempted to discharge LW-TK-5B authorized by Liquid Waste Discharge Authorization Permit #1267. When the discharge was initiated, a discharge flow control valve (FCV-LW-104-2) and a trip valve (TV-LW-105) on the liquid waste discharge line both closed due to a trip (high) on Liquid Waste Radiation Monitor (RM-LW-104). Licensee personnel flushed the lines and reset the alarm. The radiation monitor continued to indicate high background count rates and was declared inoperable at 0350. When the discharge was isolated, the recorder pen on flow recorder FR-LW-104 did not return to zero. Instead, the pen read 2.5 gpm on the high scale (0-50 gpm). A Control Room operator noticed the change on the flow recorder and secured the test tank pump and dis-

		charge valve. Though the recorder tracing did not vary, the operator believed he had completely secured the discharge from the test tank and that the recorder was in error.
April 17, 1980	0400-0600	Liquid waste transferred from Steam Generator Drain Tanks LW-TK-7A/B to the High Level Liquid Waste Tanks LW-TK-2A/B.
April 17, 1980	0800-1630	RM-LW-104 isolated for a period of 4.66 hours; discharge flow was temporarily interrupted.
April 18, 1980	1810	RM-LW-104 returned to service with a high background count rate.
April 18, 1980	2230	Steam Generator Drain Tank (LW-TK-7A) was placed on recirculation through Ion Exchanger (LW-I-1) for cleanup.
April 19, 1980	0000-2400	RM-LW-104 placed out of service. During this period, the radiation monitor was isolated for a period of 1.66 hours; discharge flow was temporarily interrupted.
April 21, 1980	1830	RM-LW-104 returned to service, still with a high background count rate.
April 22, 1980	0130-0417	The first attempt since April 16 was made for radwaste discharge under Liquid Waste Permit #1270. The discharge of Liquid Waste Test Tank (LW-TK-5A) was started but was stopped shortly thereafter because the operator noticed the high flow rate for the pumps being used. The valve lineup was reverified. The inlet valve (1LW-17) to the Liquid Waste Filters to the discharge flow control valves was found open and immediately closed by the operator. Discharge of LW-TK-5A continued. LW-TK-5B was subsequently discharged under permit #1271.

On April 22, 1980 the Resident Inspector discussed immediate corrective actions implemented by the licensee with the Operations Supervisor. These actions included:

-- Directing shift supervisors to have personnel "walk down" and verify alignments of the gaseous and liquid waste disposal systems

-- A commitment to maintain the Valve Operating Diagram status board drawings for the gaseous and liquid waste systems that are located in the Control Room up-to-date during Mode 5. A prior revision to the BVPS OM permitted maintenance of grease pencil markups to be suspended during excessive outage activity.

-- Counseling an operator who verified valve position by consulting the status board rather than visually examining the valve. This item is further discussed in paragraph 6.c, following.

The inspector subsequently verified that corrective actions specified above were implemented and had no further questions.

3) Followup and Review of Corrective Action

During the period of April 24 - May 5, 1980, the inspectors continued to review the matter with respect to the following:

-- Use of proper procedures for performing the liquid radwaste system evolutions from April 16 - April 24, 1980

-- Corrective actions taken for equipment deficiencies

-- Verification of system valve lineups

-- Maintenance of Valve Operating Diagram status boards via timely grease pencil markups

-- Performance of liquid radwaste system evolutions on April 16, 18 and 21-22, 1980.

The following operational factors have been identified as contributors to the incident.

Although the liquid waste discharge header trip valves (FCV-LW-104-2 and TV-LW-105) were subsequently found to have seat leakage which resulted in the release, the upstream valve (1LW-17) inadvertently remained open throughout the April 16-22 lineup period, providing the fluid source from the Test Tanks (LW-TK-5A/B) to the leaking trip valves. The following chronology contributed to 1LW-17 remaining open.

On April 16, the operators aligned the system for discharge of Evaporator Test Tank (LW-TK-5B) in accordance with the BVPS OM 1.17.4.E.6, Revision 7, which required 1LW-17 to be shut. The control room operator apparently instructed the auxiliary

operator to shut the valve, but due to an undetermined personnel communications problem, the auxiliary operator actually opened the valve and logged the evolution. The control room operator, understanding that the valve had been shut, marked the valve as shut on the control room Valve Operating Diagram status board. The operators have been counseled regarding the need to avoid telecommunications confusion problems and have been directed to avoid the use of telecommunications for performing such sequential evolutions by taking the required procedures or valve lists to the field for performance.

On April 18, when aligning the Steam Generator Drain Tank (LW-TK-7A) for recirculation through an ion exchanger in accordance with BVPS OM 1.17.4.U.12, the procedure provided an optional step which required 1LW-17 to be verified as shut. This step was not implemented as part of the evolution and 1LW-17 remained open, although its status was still shown as shut on the control room Valve Operating Diagram status board. Additionally, recirculation path boundary valves MOV-LW-112A and B leaked, placing recirculation pressure through valve 1LW-17.

On April 22, the operators again were aligning the system for discharge of the test tank (LW-TK-5A). The control room operator reviewed the procedure and the valve status board to establish the instructions to be given to the auxiliary operator who performed the actual manual valve alignments. Based, in part, on the fact that the status board indicated 1LW-17 to be shut, the control room operator omitted the position check of the valve from the instructions given to the auxiliary operator. As a result, again 1LW-17 remained open keeping pressure from the leakage from the recirculation of LW-TK-7A on the leaking trip valves. The individuals involved in the operations on April 22 have been counseled with regard to taking due care in the performance of valve lineups with respect to actually verifying valve position by direct observation of the equipment rather than relying on valve status board grease pencil markups. Inspector review of this aspect appears to confirm that this was an isolated case of operator oversight compounded by erroneous valve status board marking. Discussions with other control room personnel indicated that such practices are not routine and that individual procedure steps are individually verified in accordance with the procedure.

With regard to the leaking trip valve, TV-LW-105 was repaired via a maintenance work request during the week of April 28. At the close of this inspection, FCV-LW-104-2 was in the process

of repair via a maintenance work request. The acting Operations Supervisor issued Memorandum BVPS:KDG:1, dated May 5, 1980, which provides additional direction to operators with regard to the completion and documentation of system lineups, maintenance of status board markups, and general procedure documentation which addresses the above operational aspects.

The valve alignments for both liquid and gaseous radwaste systems have been walked down and verified to be in accordance with the normal system arrangement valve checklists by the licensee.

b) Leaking Welds on Residual Heat Removal (RHR) System Vents (LER 80-31)

At 0300 hours on May 21, 1980 during a routine containment tour, a licensee operator noticed a leaking weld at a high point vent (HPV-216) from a 12 inch common header between the RHR pumps and RHR heat exchangers. In order to isolate the system in the event the leak rate increased, licensee personnel made preparations to energize several motor operated isolation valves. While operators were re-energizing those valves, the Solid State Protection System (SSPS), which was out of service for system modifications, received a spurious signal indicating high RHR system pressure and output an RHR isolation signal, closing valve MOV-RH-700, suction to the RHR pumps. The 1B RHR pump, which was in service at the time, became airbound, RHR flow diminished, and the pump was shut down at 0429. The pump was subsequently vented, pressure interlock leads from the SSPS to the MOVs lifted, the valves reopened and placed under operator control, and RHR flow was restored at 0554.

The Resident Inspector was informed of this occurrence by the Operations Supervisor at 0815 hours. At 0933, the RHR pump was shut down and the system isolated in order to allow licensee personnel to make temporary weld repairs. During this time, the Resident Inspector entered containment and witnessed portions of the emergency repair effort. The inspector observed work in progress and verified that adequate radiation protection and control measures were in effect, that activities were taking place in accordance with licensee procedures, and that appropriate quality control surveillance measures were in effect. Repair work was completed and RHR flow restored at 1412. During that period, RCS temperature increased from 91 to 115 degrees F (about 5 degrees/hour) due to decay heat.

The licensee is currently studying methods of providing support to installations of a similar nature. During the exit interview, the inspectors requested information concerning the licensee's schedule for examination of other safety-related systems having similar installations. In addition, initial discussions between the inspectors

and licensee engineering personnel indicated that the licensee was considering providing supports for the subject piping of a quality less conservative than that specified for the RHR system in Table A.1-1 of the BVPS FSAR Appendix A Quality Assurance Program titled Category I Structures, Systems and Components. The inspectors requested that the licensee furnish additional information regarding the corrective actions planned for subject piping. This matter will be considered unresolved pending availability of the requested information for NRC review.

Further review of the corrective actions referenced above, as well as additional review of the previous losses of RHR flow on January 17, April 7 and April 11, 1980 will be performed in accordance with NRC review of the licensee submittal in response to IE Bulletin 80-12 and inspector followup of an Unresolved Item No. 80-01-10 (80-BU-12).

c) Loss of Diesel Driven Fire Pump (LER 80-30)

On May 19, 1980 plant operators were performing the weekly surveillance test of the diesel driven fire pump when a high temperature alarm was annunciated and the diesel overheated. The pump was removed from service. The second fire pump, a motor driven unit, had been removed from service on February 11, 1980 because of bearing overheating and was still inoperable. At that time a portable diesel driven fire pump had been placed in service as a compensatory measure for the unavailability of the motor driven unit.

The inspectors questioned the adequacy of a single portable fire pump alone to provide adequate supply to the fire water suppression system. During a telephone conversation with the Senior Resident Inspector on May 19, 1980, the Station Superintendent committed to place a second portable fire pump in service by the morning of May 20, 1980 if the diesel driven fire pump had not been returned to service.

The inspector noted that on the afternoon of May 20, 1980 the diesel driven fire pump was still out of service because the cause of overheating had not yet been determined and corrected by licensee personnel and the second portable unit had not yet been installed. The inspector immediately brought this to the attention of the Station Superintendent and requested fulfillment of the above commitment. The second portable fire pump was immediately set up and preparation made to connect it to the fire water suppression system if required. When questioned as to why the commitment had not been fulfilled, the Station Superintendent specified lack of personal attention and a misunderstanding between himself and the Operations Supervisor as to

the specific time by which the commitment was to have been met. The inspector acknowledged the Superintendent's comments but expressed concern regarding the diminished fire suppression capability available, and emphasized the need for responsiveness to and fulfillment of DLC commitments to NRC. The licensee acknowledged the inspector's comments. The inspector had no further questions on this matter.

d) Construction Deficiencies in Safety-Related Tanks (LER 80-25)

During the installation of modified piping within the Refueling Water Storage Tank (RWST), the licensee found that welds on piping penetrations through the tank wall were not constructed in accordance with the original construction specifications and requirements. The initial finding identified that a twelve inch Low Head Safety Injection suction line, which was required to have a full penetration weld between the pipe and tank wall, had only a seal weld with negligible penetration in the base metal. As a result of additional licensee inspections, sixteen other penetrations in the RWST and penetrations in the Demineralized Water Storage (DWST) Tank were found to have similar deficiencies. The DWST serves as the suction source for the Auxiliary Feedwater System. Six other tanks, supplied by the same fabricator, were found to have similar design requirements for full penetration welds but, at the close of the inspection, had not been inspected. These six tanks, comprised of two Coolant Recovery Tanks, two Boron Recovery Test Tanks, and two Primary Water Storage Tanks, were fabricated as safety-related items but are not considered to be safety-related under the current Operations Quality Assurance Program. The tanks normally contain radioactive water.

Additional NRC:RI review and investigation of this matter is discussed in IE Inspection Report No. 80-17. At the close of this inspection, the licensee was implementing repair programs for the deficient welds in the RWST and DWST; had provided an analysis which indicated that tank/piping failure would not occur under design basis accident conditions with the deficient welds present; and was continuing the review of the QA/QC records associated with fabrication of the tanks. The inspector informed the licensee that additional NRC review of their activities in this regard would be conducted during future inspections (80-12-01).

7. Gaseous Waste System Leakage

At 0300 hours on May 17, 1980, Control Room operators determined through examination of strip chart records that Gaseous Waste Decay Tank 1A (GW-TK-1A) pressure had decreased from 18 to 6 psig over the previous three week period. During that time, the tank was aligned to receive gaseous waste from the Gaseous Waste Surge Tank (GW-TK-2). The daily increment of pressure decrease appeared to be so slight as to not have

been recognized, but, when a longer period of time was reviewed, the operators identified the long term trend and its magnitude. The tank (GW-TK-1A) was immediately isolated and leak detection initiated. The NRC was notified of the occurrence via the NRC Emergency Notification System at 0330 hours.

Samples taken by the licensee from GW-TK-1A following discovery of the apparent leakage indicated no radioactivity levels above minimum detectable activity. The inspectors requested the licensee's assessment of the validity of the sample results with respect to the tank's recent operating history. Additional review by the licensee revealed that the tank volume had been recycled and discharged on two previous occasions in January and February 1980 and that a subsequent sample on March 13, 1980 had also found no detectable activity, establishing that no actual release of radioactivity had taken place due to system or tank leakage. The inspector confirmed the licensee's statements via review of the sample data and results records.

The absence of measurable activity levels in potential release pathways was further substantiated by the observation that all monitored release paths indicated no increases in background radioactivity levels during the period of gas leakage, including:

-- Radiation Monitor RM-GW-108A/B - Normal Gaseous Release Path

-- Radiation Monitor RM-VS-106 - Waste Gas Vault Ventilation

-- Radiation Monitor RM-VS-107A/B - Elevated Release Point

-- Radiation Monitor RM-GW-101 - Gaseous Waste Header

The licensee initiated a systematic inspection of the system in order to determine the leakage path. The initially postulated leakage path was via a radiation monitor purge and sample valve on RM-GW-101 and was the first point of licensee investigation. When this potential path was found not to be leaking, the Operations Supervisor initiated a progressive isolation and leak sensing of the system with existing system pressure. Subsequently, portions of the system were increased in pressure and leak checking continued. The measures employed by the licensee included a "diagnostic checklist" which recorded portions of the system which were to be or had been leak checked, including a verification signature of the individual performing the check, a temporary log established to trend gaseous waste tank pressures at four hour intervals, and maintenance checkout (via Maintenance Work Request) for suspect components or operating equipment.

At the close of this inspection, no single significant leakage path had been identified. A number of small leaks on mechanical tubing joints had been identified and corrected while leak checking continued. Subsequent to the close of this inspection, the licensee identified a slightly larger leak on the flange of a flow orifice and pressure transmitter for the Gaseous Waste Surge Tank which was repaired. At the close of this inspection, the licensee was reviewing the event for reportability per TS requirements.

As a long term preventive action, the acting Operations Supervisor stated that a weekly log for gaseous and liquid waste tank inventories would be established to permit early recognition of unplanned changes in radioactive waste inventory which could indicate unplanned or unmonitored releases to either the plant or environment. This action will be followed by the inspectors and reviewed during a future inspection (80-12-03). The inspectors had no further questions with respect to this matter.

8. Potential Integrity Problem - Recirculation Spray Heat Exchangers

The Recirculation Spray Heat Exchangers (RSHX), as part of the CSF systems, provide cooling capability for both the containment atmosphere and containment sump water. On May 28, 1980, the inspector was informed that another facility having an RSHX design similar to that of BVPS had identified weld cracking in the water box diaphragm seal weld. The water box diaphragm and seal weld provide the boundary between the containment atmosphere and the cooling water (River Water) flowing through the RSHX. A failure of this boundary during post-LOCA conditions has the potential for establishing a radiation release pathway from the pressurized containment to the environment via the RSHX discharge to the River Water System.

During this inspection, preliminary information from the other facility indicated that cracking in the circumferential seal weld may be attributable to containment integrated leak rate test pressure deflecting the diaphragm inward, stressing the seal weld. The licensee has conducted analyses and inspections in order to determine the actual or most likely failure mechanism and consequences. The information above was provided to the DLC Superintendent of Licensing and Compliance for review. The inspector requested that DLC review the information available with respect to the BVPS RSHX design in order to determine the susceptability of the BVPS equipment to similar failure modes. The inspector also informed the Superintendent of Licensing and Compliance that additional information would be provided as it became available to assist DLC in the requested evaluation. This matter will be followed during future inspections (80-12-02).

9. Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable items, items of noncompliance or deviations. Unresolved items are discussed in Paragraphs 2 and 6 of this report.

10. Exit Meetings

The inspectors met periodically during the inspection with members of licensee management and discussed the scope and findings of the inspection as presented by this report.