



## DETAILS

### 1. Persons Contacted

R. Balcerek, Maintenance Supervisor  
R. Campbell, Nuclear Control Operator  
J. Carey, Technical Assistant - Nuclear  
R. Conrad, Senior Engineer  
D. Crouch, Shift Supervisor  
W. Glidden, QA Engineer  
K. Grada, Shift Supervisor  
R. Hansen, NSQC Engineer  
A. Hartner, Shift Operating Foreman  
L. Hutchinson, Station QA  
E. Kurtz, Senior QA Engineer  
F. Lipchick, Station QA  
J. Maracek, Senior Safety Engineer  
A. Mazukna, QC Supervisor  
R. Prokopovich, Reactor Engineer  
L. Schad, Operations Supervisor  
J. Starr, Station Engineer  
J. Swartzwelder, Nuclear Control Operator  
J. Vassello, Training Coordinator  
J. Werling, Station Superintendent  
D. Williams, Results Coordinator  
H. Williams, Chief Engineer

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

### 2. Licensee Action on Previous Inspection Findings

(Closed) Inspector Follow Item (79-22-12): Review of Licensee Event Report 79-26/03L, calibration of Overpower Delta-T instrument with incorrect data. As discussed in IE Inspection Report No. 50-334/79-22, this event resulted from the attempted use of obsolete calibration data to calibrate an RCS loop temperature instrument. New calibration data for the instrument had been included in a draft revision to Maintenance Surveillance Procedure (MSP) 6.40 but had not yet been incorporated into the approved procedure which was used by the technicians for calibration activities on August 28, 1979. The error was identified by the technician and the correct calibration data sheet was provided for use.

Further review indicates that, although the correct data was subsequently utilized for the calibration, the data was not incorporated into formal revision of the MSP nor issued as an On The Spot Change which would have authorized use of the new data. Use of unapproved data for the calibration of safety-related equipment is contrary to 10 CFR 50, Appendix B, Criterion VI; the BVPS FSAR, Appendix A, Section A.2.2.6; QA Procedure OP-3, Administrative Controls, Revision 4, Section 3.3.3; and, BVPS

Maintenance Manual, Chapter 1, Section D.7, Revision 6, and constitutes an item of noncompliance at the infraction level (79-24-01). The data used on August 28, 1979 was properly reviewed and approved on December 13, 1979.

Licensee action to prevent recurrence of the original event was reviewed and found to be in progress. The Station Maintenance Supervisor informed the inspector on December 14, 1979 that the BVPS Maintenance Manual, Chapter 1, Section A.7 will be revised and issued by January 4, 1980 to incorporate document control methods which will ensure that only current procedures and data are available for use in safety-related activities. Inspector Follow Item No. 79-22-12 is closed for record purposes. The implementation of the above licensee commitment will be reviewed during future inspections and is a new unresolved item (79-24-02).

(Closed) Unresolved Item (79-17-05): Review data for motor driven auxiliary feedwater pump test obtained via OST 1.24.5, Auxiliary Feedwater Pumps Operability Test, Revision 8. At the time of the previous inspection, the licensee had not completed the subject OST for the motor driven pumps and the end of the Technical Specification prescribed surveillance interval was imminent. In order to satisfy the TS surveillance requirements, the licensee issued Operating Manual Change Notice No. 79-106 on August 31, 1979 as a "one time only" revision to OST 1.24.5. This change incorporated data obtained during the performance of OST 1.36.3 and OST 1.36.4 (Diesel Generator Auto Start Tests) on August 1 and August 9, 1979, respectively. The data was reviewed by the inspector and was determined to satisfy the requirements of OST 1.24.5 and the applicable TS surveillance requirements. The copy of OST 1.24.5 dated September 19, 1979, has been appropriately annotated and cross referenced to the required data in the other procedures.

The inspector had no further questions on this matter.

### 3. Shift Logs and Operating Records

Logs and operating records were reviewed pursuant to the licensee's administrative procedures to verify that:

- Log sheet entries are filled out and initialed;
- Log entries involving abnormal conditions are sufficiently detailed to communicate equipment status, lockout status, corrective action, and restoration;
- Log book reviews are being conducted by the staff;
- Operating orders and temporary procedures do not conflict with the Technical Specifications;
- Jumper log entries do not conflict with Technical Specifications; and,

- Logs and records are being maintained in accordance with Technical Specifications and the procedures below.

Acceptance criteria for the above review included inspector judgement, the requirements of the applicable Technical Specifications, and the following procedures:

- BVPS Operating Manual (OM) Chapter 48, Conduct of Operations;
- OM 1.48.3, Section H, Temporary Procedures;
- OM 1.48.5, Section D, Jumpers and Lifted Leads;
- OM 1.48.6, Clearance Procedures;
- OM 1.48.8, Records; and,
- OM 1.48.9, Rules of Practice.

The following logs and records were reviewed for the periods indicated:

- G1-1 (Superintendent's Daily Record), S1-1 through S1-9 (Shift Operating Report), L1-1 through L1-5 (Reactor Operator Log), L5-13 through L5-15 (Surveillance Verification Log) for the periods November 2 - December 8, 1979. Logs 51-1 through 52-3 were also reviewed for the period December 9 through December 14, 1979.
- Jumper and Bypass Log entries for the period from November 2 through November 26, 1979. The inspector verified the posting and jumphering of tag Nos. 1471, 1472, 1485-1488, and 1519-1520 on November 6, 1979.

#### 4. Plant Tours

- a. Inspection tours of selected plant areas were conducted on the dates noted below on both day and night shifts. The acceptance criteria for tour observations, unless otherwise noted, were as follows:
  - 10 CFR 50.54(k)
  - BVPS Unit 1, Systems Valve Lists and Valve Operating Drawing Markups;
  - OM 1.48.5, Safety Related Systems, Valves, and Equipment;
  - MM Chapter 1, Section J, Housekeeping;
  - MM Chapter 1, Section H, Cleaning and Maintenance Cleaning;

- SAD 25, Housekeeping and Cleanliness Procedure;
  - BVPS Radcon Manual;
  - Technical Specifications; and,
  - Inspector Judgement.
- b. The areas toured are:
- Control Room (November 5, 29-30, and December 11, 1979);
  - Primary Auxiliary Building, all levels, except locked High Radiation Areas (November 6, December 10-11, 1979);
  - Primary Auxiliary Building, 722' and 735' levels, except locked High Radiation Areas and Loose Surface Contamination Areas (December 3, 1979);
  - Safeguards Area (November 6, and December 11, 1979);
  - Fuel Handling Building (December 11, 1979); and,
  - Penetration and Pipe Tunnel Areas (November 6 and December 11, 1979).
- c. The following observations were made:
- (1) Control room monitoring instrumentation was observed to verify that instrumentation and systems required to support operation were in conformance with Technical Specification (TS) Limiting Condition for Operation (LCO) requirements. The following instrumentation/indications were observed with respect to the LCO's indicated:
- RCS Loop T-avg (November 29, 1979), TS 3.1.1.5
  - BA Storage Tank Level and Temperature, TS 3.1.2.7.a.1 and .3 (December 11, 1979)
  - RWST Level and Temperature (November 29, 1979), TS 3.1.2.8.b
  - Control Rod Group Height (November 6, 29, 1979), TS 3.1.3.1
  - Rod Position Indicator Channel Operability , TS 3.1.3.2 (November 29, 1979)
  - Control Rod Insertion Limits (November 29, 1979), TS 3.1.3.5



- Instrumentation Operability (Channel Checks) TS 3.3.1.1 and 3.3.2.1 (November 6 - Pressurizer Pressure, Pressurizer Level, Loop A Steam Flow, Loop C Feedwater Flow) (November 29, 30 - Intermediate Range Neutron Flux, Power Range Neutron Flux, RCS Flow, Steam Generator Water Levels) (December 11 - Source Range Neutron Flux)
  - Radiation Monitoring Channels (Channel Checks), TS 3.3.3.1 (November 27, 28 - RM-VS 104A & B, RM-VS 215A & B)
  - Containment Sump Discharge Flow Measurement, TS 3.4.6.1.b (November 6)
  - Pressurizer Spray Water Differential Temperature, TS 3.4.9.2.c (November 6, 28 and December 11)
  - ECCS Accumulator Level and Pressure, TS 3.5.1 (November 6, 28)
  - Boron Injection Tank Level and Temperature, TS 3.5.4.1 (November 6)
  - Containment Internal Pressure, TS 3.6.1.4 (November 6)
- (2) The inspector verified that selected valves were properly positioned or in the condition required by Technical Specifications or plant procedures for the applicable plant mode. The following valves' positions were observed to be correct on the dates noted:
- TV-MS-111A, B, C; MOV-RW-105A, B, C; MOV-SI-1869A, B; TV-1CV-150A (November 29)
  - MOV-QS-101A, B; MOV-RS-155A, B; MOV-RS-156A, B; TV-1CC-103A, A1, B, B1 (November 6)
  - TV-CV-150A, B; 1IA90; 1HY111; 1HY110; 1VS151 (December 3)
- (3) Radiation controls established by the licensee, including posting of radiation areas, the conditions of step-off pads, and the disposal of protective clothing were observed and selected radiation work permits were reviewed as noted in the following areas. Locked barriers to High Radiation Areas were also confirmed to be secure.
- Primary Auxiliary Building, 722' and 735' levels (December 3)
  - Primary Auxiliary Building, all levels (November 6)

- Safeguards Pump Areas (November 6, December 11)
  - Quench Spray Pump Room (November 6)
  - West Pipe Tunnel/Penetration Areas (November 6, December 3, 10)
  - Containment Airlock Area (December 3, 10)
- (4) Plant housekeeping conditions including general cleanliness conditions and control of materials to prevent fire hazards were observed in the areas listed in Paragraph b above. Maintenance of fire barriers in these areas was also observed as discussed in Paragraph d below.
  - (5) Systems and equipment in all areas toured were observed for the existence of fluid leaks and abnormal piping vibrations.
  - (6) Lit control board annunciators as listed in Paragraph d below were reviewed with control room operators to verify that the reasons for the alarmed conditions were understood and that corrective action, if required, was being taken.
  - (7) Control room manning was observed on the dates noted in Paragraph b above and during other periodic control room visits. Shift turnovers were observed on December 5 and 11 in order to confirm that continuity of system status information was maintained.

Except as further discussed in this report, the inspection findings were acceptable.

d. Findings

- (1) On November 29 and 30, 1979, the inspector reviewed the lit or out of service (OOS) annunciators on the main control board during operation at approximately 35% power. A listing of the annunciators reviewed is provided below, including the proximate cause for the annunciated or OOS condition. A large number of annunciators were affected and provided a potential for operator confusion if a transient or accident occurred. The listing was provided to the Station Superintendent and Operating Supervisor for review and action. The inspector noted that several of the conditions noted had been in existence for more than two years and that all of the conditions should be reviewed for implementation of corrective action prior to facility restart. Station management acknowledged the inspector's comments at an exit meeting on December 14, 1979, and stated that such a review and appropriate corrective action to minimize the number of alarms would be implemented prior to restart. This item will remain unresolved pending review of the licensee's actions prior to station startup from the current outage (79-24-03).

The annunciators reviewed were:

<u>TITLE</u>	<u>CAUSE</u>
BIT RECIRC FLOW LOW (OOS)	Heat tracing problem on instrument lines. Engineering in progress.
BIT SURGE TANK LEVEL HIGH (OOS)	Level Switch Problem. MWR issued.
SI PPIA SEAL WATER LEVEL LOW (OOS)	Level Switch Problem. MWR issued.
SEQUENCE OF EVENTS RECORDER TROUBLE (OOS)	Spurious Alarm Problem. MWR issued.
BIT SURGE TANK TEMPERATURE HIGH (LIT)	Heat trace instrumentation problem. MWR issued.
CONTAINMENT INSTRUMENT PIT LEVEL (LIT)	Normal water accumulation.
BIT TEMPERATURE HIGH (LIT)	Heat trace instrumentation problem. Long term maintenance in progress.
OSRS P2A & P2B SEAL LEVEL HIGH (LIT)	Normal operating condition.
1B RW PUMP SEAL PRESSURE LOW (LIT)	Pump OOS for repair.
RHR FLOW LOW (LIT)	Normal operating condition.
GWD CHARCOAL FILTER DP HIGH (LIT)	Specific cause not determined by inspector. MWR issued on instrument.
GWD COMPRESSOR 1B LOCAL PANEL TROUBLE (LIT)	Compressor oil leak. MWR issued, equipment out of service.
HYDROGEN RECOMBINER PANELS A & B TROUBLE (FOUR WINDOWS LIT)	Normal operating condition.



GW DECAY TANK SAMPLE ANALYZER 1 & 2 OXYGEN CONTENT HIGH (OOS)	Instrument problem. MWR issued.
STEAM GENERATOR DRAIN TANK LEVEL LOW (LIT)	Normal operating condition.
LW EVAP DISTILLATE ACCUM TANK LEVEL HIGH (OOS)	Specific cause not determined by inspec- tor. MWR issued.
LW EVAP LEVEL HIGH (LIT)	Transmitter problem. MWR issued.
LW EVAP TEST TANK 5B LEVEL HIGH LOW (LIT)	Normal operating condition.
LW EVAP DRAIN TANK 3A LEVEL HIGH LOW (LIT)	Normal operating condition.
CONTAMINATED SHOWER AND LAUNDRY DRAIN TANK 6A LEVEL HIGH LOW (LIT)	Normal operating condition.
BORON EVAP CIRC PP 6A SEAL FLOW LOW (LIT)	Seal water normally secured.
BORON EVAP CIRC PP 6B SEAL FLOW LOW (LIT)	Seal water normally secured.
BORON EXAP TEST TANK 2A LEVEL HIGH LOW (LIT)	Normal operating condition.
BORON EVAP 1B LEVEL HIGH (LIT)	Normal condition. Equipment shutdown.
BORON EVAP PUMP 6B DISCHARGE PRESSURE HIGH LOW (OOS)	Specific cause not determined by inspec- tor. MWR outstanding since 1976.
COOLANT RECOVERY TANK 4A LEVEL HIGH LOW (LIT)	Normal operating condition.
COOLANT RECOVERY TANK 4B LEVEL HIGH LOW (LIT)	Normal operating condition.
BORON EVAP DISTILLATE ACCUMULATOR 1A LEVEL HIGH LOW (OOS)	Level transmitter problem. MWR issued.
BORON EVAP DISTILLATE ACCUMULATOR 1B LEVEL HIGH LOW (LIT)	Equipment shutdown.

BORON EVAP BOTTOMS PUMP THERMAL OVERLOAD (LIT)	Pump OOS for maintenance.
BORON EVAP BOTTOMS COOLER DISCHARGE TEMP HIGH LOW (LIT)	Equipment shutdown.
BA TANK 1A LEVEL HIGH LOW CHANNEL I (LIT)	Tanks filled above high alarm.
BA TANK 1A LEVEL HIGH LOW CHANNEL II (LIT)	Tanks filled above high alarm.
BA TANK 1B LEVEL HIGH LOW CHANNEL I (LIT)	Tanks filled above high alarm.
BA TANK 1B LEVEL HIGH LOW CHANNEL II (LIT)	Tanks filled above high alarm.
BA TANK 1B TEMP HIGH LOW CHANNEL I (LIT)	High temperature condition due to heat trace and alarm set-point overload.
BA TANK 1B TEMP HIGH LOW CHANNEL I (LIT)	High temperature condition due to heat trace and alarm set-point overload.
BORIC ACID CONCENTRATION HIGH LOW (LIT)	Boronometer OOS.
LOOP FILL HEADER HIGH PRESSURE (LIT)	Valid alarm due to FCV-CH-160 seat leakage during charging operation.
PRIMARY DRAIN TRANSFER TANK 1 PUMP THERMAL OVERLOAD (LIT)	Pump OOS for maintenance.
PRIMARY DRIAN TRANSFER TANK 2 PUMP THERMAL OVERLOAD (LIT)	Pump OOS for maintenance.
RCP 1A SEAL INJECTION BYPASS TO VCT FLOW LOW (OOS)	Flow instrument problem. MWR issued.
RCP 1B SEAL INJECTION BYPASS TO VCT FLOW LOW (LIT)	Normal operating condition.
RCP 1C SEAL INJECTION BYPASS TO VCT FLOW LOW (LIT)	Normal operating condition.

PZR PWR RELIEF VALVE NITROGEN SUPPLY PRESSURE LOW (LIT)	Normal operating condition.
PZR BU GROUP ON MANUAL/OVERCURRENT TRIP (LIT)	BU heaters on manual. Normal operating condition.
LOOP T-AVG DEVIATION (LIT)	Calibration in progress.
DELTA FLUX OUT OF TARGET BAND (LIT)	Valid alarm, LCO compliance verified.
COMPUTER ALARM DELTA FLUX HIGH (LIT)	Valid alarm, LCO compliance verified.
T-AVG DEVIATION FROM T-REF (OOS)	Annunciator malfunction. MWR issued.
NIS PR LOW SETPOINT FLUX DEVIATION OR AUTO DEFEAT (LIT)	Normal operating condition.
NIS SR LOSS OF CH I DETECTOR VOLTAGE (LIT)	Normal operating condition.
NIS SR LOSS OF CH II DETECTOR VOLTAGE (LIT)	Normal operating condition.
NIS SR HIGH SHUTDOWN FLUX ALARM BLOCKED (LIT)	Normal operating condition.
NIS PR HIGH SETPOINT FLUX DEVIATION OR AUTO DEFEAT	Normal operating condition.
PART LENGTH ROD CONTROL ALERT (LIT)	Normal operating condition.
ROD BANK D FULL WITHDRAWAL (LIT)	Normal operating condition.
SOE THERMOCOUPLE INPUT IN ALARM (LIT)	Thermocouple input problems. MWR issued.
ROD POSITION SYSTEM DC POWER SUPPLY FAILURE (OOS)	Annunciator problem. MWR issued.
MAIN TRANSFORMER OVEREXCITATION GENERATOR TRIP (OOS)	Alarm disconnected for use of temporary main transformer installed in 1978.

MAIN TRANSFORMER DIFFERENTIAL PROTECTION GENERATOR TRIP (OOS)	Alarm disconnected for use of temporary main transformer installed in 1978.
FUEL POOL PUMP 1A DISCH PRESS LOW (LIT)	Pump out of service.
FUEL POOL PUMP 1B DISCH PRESS LOW (LIT)	Pump out of service.
POOL PURIF PUMP THERMAL OVERLOAD (LIT)	Pump out of service.
POOL PURIF PUMP 4A DISCH PRESS LOW (LIT)	Pump out of service.
POOL PURIF PUMP 4B DISCH PRESS LOW (LIT)	Pump out of service.
REFUELING CAVITY LEVEL HIGH LOW (LIT)	Cavity empty.
PRI PLANT DEMIN WATER STORAGE TK LEVEL HIGH LOW CHANNEL I (LIT)	Low level alarm set-point is greater than allowable normal level.
PRI PLANT DEMIN WATER STORAGE TK LEVEL HIGH LOW CHANNEL II (LIT)	Low level alarm set-point is greater than allowable normal level.
TURBINE PLANT DEMIN WATER STORAGE TK LEVEL HIGH LOW (LIT)	Valid low level alarm.
SCREENWASH PUMP TROUBLE (LIT)	Routine operational problem.
N <sub>2</sub> BLANKETING SYSTEM PRESSURE LOW (LIT)	Normal operating condition.
CHLORINATION SYSTEM LOCAL PANEL TROUBLE (LIT)	Specific cause not determined by inspector.
REHEATER DRAIN RECEIVER TANK 1A LEVEL LOW (LIT)	Reheaters isolated.
REHEATER DRAIN RECEIVER TANK 1B LEVEL LOW (LIT)	Reheaters isolated.
REHEATER DRAIN RECEIVE TANK 1C LEVEL LOW (LIT)	Reheaters isolated.

RAW WATER PUMP DISCHARGE PRESSURE LOW (OOS)	Specific cause not determined by inspector. MWR issued.
SG BLOWDOWN TANK LEVEL LOW (LIT)	Normal operating condition.
GLAND STEAM SUPPLY PRESSURE HIGH LOW (LIT)	High alarm setpoint below existing operating pressure.
TURBINE GLAND STEAM PRESSURE HIGH LOW (LIT)	Remote instrumentation mismatch with local gage. System operated on local gage.
"D" USS TRANSFORMER ALARMS - WINDOW NOS. A8-19, -55, -61, -62, -63, -69, -70, and -72 (LIT)	Transformer out of service.
125 VDC BATT CHARGER 3 FAILURE (LIT)	Recurrent alarm due to normal low operating currents.
125 VDC BATT CHARGER 4 FAILURE (LIT)	Recurrent alarm due to normal low operating currents.

(2) During control room tours on November 27-28, 1979, the inspector noted particulate and/or radiogas process radiation monitors which displayed either high or low flow alarms as listed below. The inspector reviewed these conditions with respect to the facility Technical Specifications; the BVPS Operating Manual, Section 1.43; and the BVPS Radcon Manual, Chapters 1 and 4. The tabulation below provides the conditions observed on the dates above:

- Waste Tank Vault Exhaust Gas Monitor (RIS-VS-106) - Sustained high and low flow alarms on November 27. Cleared on November 28.
- Elevated Release Monitor (RM-1VS-107) - Sustained low flow alarm on November 27 and 28. Unit is equipped with an isokinetic sample flow control unit with a varying setpoint.
- Containment Monitor (RM-1RM-215A) - Sustained low flow alarm on November 27. Cleared on November 28.
- Multi-Sample Monitor (RM-1RM-217) - Sustained high flow alarm on November 27. Cleared on November 28.



During the inspector's review of the above noted conditions, the following determinations were made with regard to existing administrative controls for the operation and maintenance of station radiation monitoring equipment.

-- The BVPS Operating Manual (OM), Table 43-1 and the BVPS Radcon Manual, Form No. RCM-F229, provide conflicting sample flow rate acceptance criteria for the following radiation monitors:

<u>Monitor</u>	<u>OM Table 43-1</u>	<u>RCM-F229</u>
Gaseous Waste Monitor RM-1GW-108	8.5 SCFM	None
Aux. Bldg. Ventilation Exhaust A Monitor (RM-1VS-102A)	8.5 SCFM	5.0 SCFM
Aux. Bldg. Ventilation Exhaust B Monitor (RM-1VS-102B)	8.5 SCFM	5.0 SCFM
Leak Collection Area Gas Monitor (RM-1VS-105)	8.5 SCFM	None
Waste Gas Delay Tank Vaults Ventilation Moni- tor (RM-1VS-106)	8.5 SCFM	5.0 SCFM
Elevated Release Moni- tor (RM-1VS-107)	8.5 SCFM	None - Variable isokinetic set- point.
Containment Monitor (RM-1RM-215)	8.5 SCFM	8.0 SCFM
Waste Gas Decay Tank Monitor (RM-1GW-101)	0.55 SCFM	8.5 SCFM - Vari- able isokinetic setpoint.

The inspector further determined that sample flow rate checks and adjustments were made by the Radcon Department on a weekly basis using the data from the right hand column above. During a meeting with station management on December 4, 1979, the inspector was informed by the licensee that the values in the OM Table 43-1 were correct on the basis of data generated during preoperational testing.

Neither of the documents described above provides tolerances for the acceptable sample flow rates. The inspector's review of sample flow logs maintained by the Radcon Department for the

period of October 3 through November 28, 1979, indicates that each of the above monitors was operated at sample flow rates which did not meet either set of acceptance criteria. During the period indicated, the logged values varied as follows and were out of specification for at least one week or more.

<u>Monitor</u>	<u>Acceptable</u>	<u>Actual</u>
RM-1GW-108	8.5 SCFM	6.5-9.0 SCFM
RM-1VS-102A	8.5 SCFM	1.5-3.0 SCFM
RM-1VS-102B	8.5 SCFM	4.0-7.5 SCFM
RM-1VS-105	8.5 SCFM	No sample line vacuum indicated. Noted as unable to read flow value.
RM-1VS-106	8.5 SCFM	5.0 to off scale high.
RM-1RM-215	8.5 SCFM	Off scale high. High vacuum indicated.
RM-1RM-217	8.5 SCFM	4.0 to off scale high.

During meetings with the inspector on December 4 and 6, 1979, the licensee presented information which established that the variations in flow noted did not sufficiently affect instrument sensitivity to have resulted in releases of radioactivity or exposure to individuals greater than station administrative or license limits based on measured activity levels, instrument characteristics and process flow rates. The licensee acknowledged the discrepancies noted above and stated that corrective action would be initiated immediately to ensure prompt correction of mechanical and administrative problems which resulted in the above conditions. The inspector noted that, until identified during this inspection, the licensee had not consistently implemented corrective action for out of tolerance flows, apparently due to the fragmentation of responsibilities for operation of the equipment between the Radcon and Operations Departments. The licensee acknowledged the inspector's comments and stated that a Radiological Controls Engineer has been assigned the responsibility for operability of and ensuring prompt corrective action for radiation monitoring equipment on a daily basis.

- The BVPS Operating Manual, Section 1.43.A and B, Particulate and Gaseous Radiation Monitor Startup procedures, provide instructions to verify proper operation of the respective units by observing the absence of high/low flow alarms. The inspector determined that no calibration

procedures nor setpoints have been established or implemented for the radiation monitor flow alarm circuits. Although informal documentation of desired setpoints was made available to the inspector, the licensee had not incorporated the data into the station's calibration program. The licensee informed the inspector that, based on preoperational test data, the flow rate acceptance criteria should include a  $\pm 10\%$  flow tolerance. The licensee intends to incorporate this tolerance into existing operating procedures and develop flow alarm circuit calibration procedures with flow alarm setpoints corresponding to the high and low tolerance values. At the close of this inspection, draft procedures addressing the above had been prepared and were undergoing review.

Technical Specification 6.8.1.a and Regulatory Guide 1.33, Quality Assurance Program Requirements (Operation), 1972, require that procedures for startup, operation, shutdown, and calibration of safety-related systems, including process radiation monitoring systems, be established, implemented and maintained. Contrary to these requirements, (a) Radcon Manual Form No. RCM-F229 provided incorrect acceptance criteria for maintenance of sample flow rates; (b) BVPS Operating Manual Sections 1.42.4.A and B, Revision 4, required the use of flow alarm circuits as indicators of system operability although neither calibration procedures nor alarm setpoints had been established for the equipment; and, (c) Radcon Manual Form No. RCM-F229 log data indicates that the radiation monitors listed previously were operated with sample flow rates consistently out and with sustained alarms present. Flow adjustments performed in accordance with existing procedures were unsuccessful in correcting out of specification sample flow rates, and no additional corrective action was consistently implemented and documented. The above examples constitute noncompliance with the stated requirements (79-24-04).

As a result of the above findings, the licensee initiated corrective action as discussed above. Additionally, the licensee is reviewing the existing condition and maintenance history of the subject monitors and is pursuing correction of identified equipment problems. The licensee further stated that an augmented radiation monitoring system is being planned for installation in response to NUREG 0578, TMI Lessons Learned.

- (3) During a tour of the Primary Auxiliary Building on December 3, 1979, the inspector observed work associated with IE Bulletin 79-02, Pipe Base Plant Designs Using Concrete Expansion Anchor Bolts. Anchors associated with the common, non-redundant portions of the Component Cooling Water (CCR) System piping were being tested, requiring the removal of grout from beneath floor mounted base plates. Several of the plates in the system

had apparently been completely tested and appeared to be awaiting the installation of new grout. Discussions with licensee personnel were unable to establish the schedule or priority assigned to reinstallation of the grout. Because the several plates observed had a significant percentage of their grout removed for testing, the inspector expressed concern for the operability of the subject plates and the non-redundant portion of the CCR system. Discussion on December 3, 1979 with the responsible licensee engineering supervisor in DLC headquarters, confirmed that the grout was to be replaced on a prompt, progressive basis as each plate was completely tested and/or repaired. The licensee representative stated to the inspector that the responsible construction personnel had been informed of the need to promptly reinstall the grout and that DLC commits to reinstallation within one to three working days of test or repair completion. Subsequent observation of the work areas on the 722' and 735' levels of the building by the inspector confirmed licensee implementation of this commitment. The inspector had no further questions on this matter and will routinely review the licensee's program for anchor bolt testing during a future inspection.

- (4) During plant tours on November 6 and December 10-11, 1979, the inspector observed that several doors in the Primary Auxiliary Building and adjacent spaces were either damaged or propped open as noted below. The condition of the doors was brought to the attention of the Plant Superintendent on November 6 and December 11, 1979, respectively, and corrective action was either initiated or confirmed to be in progress as noted.

The following discrepancies were observed:

- Door between the West Cable Vault and Auxiliary Feed Pump Room was found propped open and obstructed on November 6, 1979. The door was immediately closed and the obstruction removed. Subsequent tours of this and similar areas has not revealed any recurrence. The licensee has placarded this and similar cable vault doors as fire area boundaries which must remain shut and unobstructed. This item is considered an isolated occurrence and will be the subject of future tour observations.
- The elevator stairwell door on the 722' level of the Primary Auxiliary Building was observed to be damaged on December 10, 1979. The door and door closer were damaged such as to prevent complete engagement of the door jamb. The licensee made temporary repairs to the door during the week of December 10 and informed the inspector that a replacement door and hardware had been ordered.



- The stairwell door to the West Cable Vault on the 735' level of the Primary Auxiliary Building was observed on December 11, 1979 to be missing one door knob and was blocked open. The Senior Safety Engineer informed the inspector on December 11 that a preliminary evaluation indicates that fire barrier integrity is maintained by adjacent doors which are functional.
- The door between the Containment Personnel Airlock area and the Steam Generator Blowdown Tank Room on the 767' level of the Primary Auxiliary Building was found to be open with its door closer inoperable on December 10, 1979. The Senior Safety Engineer informed the inspector that preliminary evaluation indicates that fire barrier integrity is maintained by adjacent doors which are functional.
- The door between the 722' level of the Primary Auxiliary Building and the East Pipe Tunnel was found blocked open on November 6, 1979. The block was immediately removed and the door closed. Workers in the area were using the door for passage of maintenance equipment and were aware of fire watch duties.

The inspector reviewed the integrity of the above doors with respect to the licensee's fire protection program, including the following references:

- Technical Specification Amendment No. 11, issued November 30, 1977;
- Technical Specification Amendment No. 18, issued June 6, 1979;
- DLC Fire Protection Program Review, APCSB 9.5-1, Appendix A, 1976; and,
- Operating Surveillance Test No. 1.33.14, Penetration Fire Barriers Visual Inspection, Revision 10, performed July 22, 1979.

None of the above documents specifically identify those doors which constitute "fire barrier penetrations" in the context of Technical Specification 3/4.7.15 and APCSB 9.5-1, Positions 5.1.j and D.4.f. The Station Chief Engineer informed the inspector that identification of specific doors is in progress as part of the licensee's effort to establish a fire protection QA and procedures program in accordance with commitments documented in Amendment No. 18 of the Technical Specifications. Amendment No. 18 requires implementation of a fire protection



QA program and attendant procedures on or before September 30, 1979. The licensee stated that the procedures for surveillance and control of fire barriers are in preparation and will be implemented by December 31, 1979.

The Chief Engineer informed the inspector that, in the interim, the door deficiencies discussed above and other door deficiencies identified by the licensee will be reviewed by the Onsite Safety Committee to confirm that no immediate fire or personnel hazard exists and to specify immediate corrective or preventive action if appropriate. The licensee had completed this review and had initiated door repairs by December 21, 1979. Additionally, the Chief Engineer informed the inspector on December 27, 1979, that additional Construction Division Safety Engineers will be assigned to outage activities to ensure prompt identification and correction of similar problems.

The inspector informed the Chief Engineer on December 14 that, based upon review of OST 1.33.14, only eleven doors are currently subject to surveillance in accordance with TS 4.7.15. The Limited Surveillance appears inconsistent with the intent of the DLC Fire Protection Program Review fire barrier analyses. The subject OST will require revision pending identification of specific fire barrier doors. Additionally, the inspector noted that, although TS surveillance requirement specifies an eighteen month frequency, recent experience indicates a need for more frequent verification of fire door integrity to ensure that transient conditions or door damage does not constitute a long term hazard. The licensee acknowledged the inspectors comments.

The matter of fire barrier door operability and adequacy of surveillance procedures will remain unresolved pending NRC review of the licensee's actions (79-24-05).

#### 5. In Office Review of Licensee Event Reports (LER's)

The inspector reviewed LER's 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 LER's were reviewed:

- 79-39/99X, Reactor Trip and Safety Injection;
- 79-40/99X, Safety Injection;
- 79-42/03L, RCS Loop A Feedwater Flow Channel II Inoperable;
- 79-43/03L, Analysis of diesel fuel sample not completed within required time;

- 79-44/03L, Control Room emergency air bottle below allowable pressure;
- 79-45/03L, Boric Acid Tank boron concentration less than required;
- \*-- 79-46/01T, Closure and clearance of valve in ESF flowpath to High Head Safety Injection pumps with emergency power unavailable to redundant valve;
- 79-47/01T, Improperly installed radiation monitor access cover; and,
- 79-49/01T, Failure to obtain required grab sample of containment atmosphere.

No items of noncompliance were identified.

\*denotes reports selected for onsite followup.

#### 6. Onsite Licensee Event Followup

For the LER 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 LER's reviewed onsite:

LER 79-46/01T - On November 27, 1979, from approximately 8:30 a.m. to 10:30 a.m., maintenance activities rendered both ECCS subsystems inoperable in that (a) Refueling Water Storage Tank (RWST) isolation valve MOV-CH-115D was removed from service for corrective maintenance and was incapable of automatic opening in response to a safety injection signal, and (b) RWST isolation valve MOV-CH-115B, in the redundant subsystem, was closed, had no emergency power available, and thus was incapable of automatic opening in response to a safety injection signal if there had been a condition of loss of offsite power. During this time the facility was operating at approximately 30% power. This matter is the subject of a "Notice of Violation and Proposed Imposition of Civil Penalty" and an "Order Modifying License" which were issued to the licensee by the Director, OIE, on December 5, 1979. During the period of November 27 through December 8, 1979, the resident inspector performed a review of the circumstances surrounding the event (documented in IE Inspection Report No. 50-334/ 79-30).

In conjunction with that review, the inspector also reviewed the malfunction which required MOV-CH-115D to be removed from service and the effect of that malfunction upon its operability. At approximately 1:30 p.m. on November 25, 1979, MOV-CH-115D failed to close in response to a remote

manual signal from the Main Control Board during performance of Operating Surveillance Test (OST) 1.11.7, ECCS Flow Path and Valve Position Check. During this test the valve would open normally but required two to three hand switch actuations to effect closure. Based on the need for remote closure of the valve to establish post-LOCA recirculation phase ECCS realignment, the Shift Supervisor and Operations Supervisor forwarded the matter of valve operability to the Onsite Safety Committee (OSC) for review. On November 26, 1979, during OSC Meeting No. BV-1-81-79, the OSC reviewed the matter and determined that the valve was operable with respect to the automatic safety injection (opening) function and could be shut by its manual handwheel if remote operation was impossible during recirculation phase ECCS realignment. The OSC noted that the above action would only be required as a backup to the intermittently malfunctioning remote operation and that the flowpath is also equipped with a check valve, SI-27, which would prevent backflow to the RWST should MOV-CH-115D remain open during post-LOCA recirculation. On November 27, 1979, repairs were begun on the subject valve resulting in the event described by the LER. Repair activities were suspended at approximately 10:15 a.m. on November 27, 1979.

During a review of the event on November 27-28, 1979, the inspector noted the information above and was informed by the licensee that the valve had not yet been repaired. The inspector informed the licensee on November 28 that the malfunctioning valve could not be considered operable for entry into post-LOCA recirculation under the licensee's existing procedures and requested additional DLC review of the matter. The inspector also conducted informal discussions on November 28, 1979 with representatives of NRC:NRR, Division of Operating Reactors. Based upon those discussions, the licensee was informed by the inspector that the following actions appeared necessary to ensure successful entry into post-LOCA recirculation phase operation if required:

- Emergency procedure operating instructions should be revised to required local manual closure of MOV-CH-115D or other more accessible valves in the flow path should remote operation be unsuccessful;
- All operators who might be called upon to perform such an operation should be briefed on the procedure and the specific method of local manual valve operation;
- Those operators should also perform a dry run walkthrough of the required actions to ensure they know the actual location and operation of the valve; and,
- The above actions should be documented in the plant's records and would be confirmed by inspector interviews and observations of the operators.

The licensee initiated the above activities on the morning of November 28 concurrent with reinitiation of corrective maintenance on MOV-CH-115D. The actions above were still in preparation at approximately 2:00 p.m. when repair of a failed motor operated torque switch on MOV-CH-115D was



completed and the valve was successfully returned to service. The inspector reviewed completed copies of OST 1.11.10, Boron Injection Flow Path and ECCS Subsystem Valve Exercise, and OST 1.11.7, ECCS Flow Path and Valve Position Check, which documented the satisfactory testing of the valve on November 28, 1979. The inspector had no further questions on the specific corrective actions taken in this case.

7. Potential Design Deficiencies - Generic To Architect Engineer

On November 8, 1979, the inspector was informed by NRC:RII of Seismic Design and ESF Reset Function design deficiencies at another facility which are potentially applicable to BVPS. The concerns were based upon deficiencies in designs similar to that of BVPS performed by the same architect engineer. The concerns listed in Paragraphs a through c below were communicated to the licensee on November 8, 1979. As a result of subsequent input from NRC:RII, the concerns listed in Paragraphs d through f below were identified to the licensee by the inspector on November 30, 1979. The ESF Reset Function items, if applicable to BVPS, appear to be in conflict with commitments made in the BVPS FSAR, Sections 6 and 7 and associated Questions and Answers, and may constitute unreviewed safety questions pursuant to 10 CFR 50.59. The BVPS FSAR includes commitments which require that no ESF equipment will automatically actuate or change state upon actuation of an ESF Reset Function. The following potential problems were identified to the licensee.

- a. Safeguards building exhaust ventilation ducts not seismically supported. Preliminary review by DLC has indicated that the entire Supplementary Leak Collection and Release System (SLCRS) is of a substantially different design than that of the reporting facility. Additionally, the Technical Assistant-Nuclear informed the inspector on November 9, 1979, that the seismic design of the system's ductwork has been recently reviewed in association with fuel handling accident analyses and review of containment purge operations.
- b. Use of obsolete seismic amplified response spectra (ARS) for analysis of reactor plant auxiliary systems. The Technical Assistant-Nuclear informed the inspector on November 9, 1979, that the ARS utilized for BVPS systems has been verified as part of the seismic piping reanalysis associated with the NRC Show Cause Order of March 13, 1979. The ARS was verified as part of the Shock II/Shock III computer program reanalysis effort.
- c. Automatic repositioning of post-accident ventilation system dampers upon reset of ESF actuation signals. Design requirements for these systems are provided by commitments made in the FSAR and the requirements of IEEE-279 which stipulate that no automatic action will occur upon actuation of the reset signal alone. The licensee's initial review included three areas.

At the reporting facility, Control Room emergency ventilation dampers automatically repositioned on reset actuation. Review of the BVPS design indicates that this will not occur due to individual, local reset circuit actuation being required in the control room before dampers can be repositioned.

The SLCRS Main Filter bank inlet and bypass dampers will reposition on reset of the Phase A Containment Isolation (CI-A) Signal unless a high radiation alarm is present (seal-in circuit). As currently established, Emergency Procedures E-1, Loss of Reactor Coolant; E-2, Loss of Secondary Coolant; and, E-3, Steam Generator Tube Rupture, include procedure steps which require the operator to manually select the desired damper position prior to resetting safety injection and containment isolation signals, thereby preventing undesired repositioning of the dampers.

Charging Pump Cubicle exhaust dampers will shift from normal Auxiliary Building Ventilation to SLCRS alignment upon receipt of a CI-A signal. Resetting the CI-A signal results in the dampers automatically shifting to the Auxiliary Building ventilation (non-ESF) alignment unless hand switches located in the Auxiliary Building are placed in the desired ESF position. The licensee has completed a preliminary evaluation of this condition. During the week of November 13, 1979, the station Operations Supervisor informed NRC:RI that a design change would be initiated during the current outage to appropriately modify the damper control circuits.

- d. Potential for overriding Inside and Outside Recirculation Spray Pump automatic start via Phase B Containment Isolation (CI-B) Signal reset. The pumps are started after a 185-225 second time delay following CI-B initiation. The potential exists for premature resetting of the CI-B signal to override the automatic timer circuits preventing pump start. The licensee's preliminary evaluation indicates that the circuit features exist at BVPS but that the existing Emergency Procedures provide sufficient control in that CI-B signals are not reset by procedures until well after the three to four minute delay required for pump start.
- e. Effect to Stub Bus operation on Emergency Diesel Generator (EDG) loading during a blackout which follows CI-B reset. On receipt of a CI-B signal, the 4160 VAC stub busses are automatically disconnected from the 4160 emergency busses. Resetting the CI-B signal permits the operator to reenergize stub bus nonvital loads from the emergency busses. Should this sequence be followed by a blackout requiring EDG operation, it appears that the undesirable loads on the stub busses may not be stripped and could result in an inadvertent EDG overload condition.
- f. Air Ejector vent containment isolation valve operation after CI-B reset with Air Ejector Radiation Monitor Alarm present. Receipt of the radiation monitor alarm causes the air ejector discharge to



shift from its normal atmospheric exhaust to the containment via a containment isolation valve. The containment isolation valve will shut upon receipt of a CI-B signal, but may reopen automatically upon receipt of the CI-B reset signal if the radiation monitor alarm signal is still present thereby potentially compromising containment integrity.

The facility was shutdown on November 30, 1979, for an extended modification and refueling outage. On December 12, 1979, the Technical Assistant-Nuclear informed the inspector that the review of the above items was in progress and would be complete, including corrective action prior to startup from the current outage. Although engineering review was proceeding, the licensee's safety committees had not yet had the opportunity to review the items as potential unreviewed safety questions. Based upon the scheduled July, 1980 restart, the inspector stated that the licensee's actions in that regard would be reviewed prior to station startup and the matter would remain unresolved (79-24-06). The inspector also informed the licensee that, should any of the items above be identified as unreviewed safety questions, the appropriate licensee event reports must be submitted within the required time frames.

8. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable, items of noncompliance or deviations. Unresolved items addressed during this inspection are discussed in Paragraphs 2, 4, and 7 of this report.

9. 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.