

LICENSEE EVENT REPORT

CONTROL BLOCK / / / / / (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)
 /0/1/ /V/A/N/A/S/1/ (2) /0/0/-/0/0/0/0/0/-/0/0/ (3) /4/1/1/1/1/ (4) / / / (5)
 LICENSEE CODE LICENSE NUMBER LICENSE TYPE CAT
 /0/1/ REPORT /L/ (6) /0/5/0/0/0/3/3/8/ (7) /0/5/1/9/8/2/ (8) /0/7/1/9/8/2/ (9)
 SOURCE DOCKET NUMBER EVENT DATE REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

/0/2/ / On May 19, 1982 at 0300 during cooldown to Mode 5, the nitrogen supply pressure /
 /0/3/ / to the pressurizer power operated relief valve (PCV-1456) decreased causing this /
 /0/4/ / PORV to be declared inoperable. On May 22, 1982 at 2115, it was reported that the /
 /0/5/ / nitrogen supply to the redundant PORV was found isolated. This rendered both /
 /0/6/ / PORV's inoperable contrary to T.S. 3.4.9.3. These events are reportable /
 /0/7/ / pursuant to T.S. 6.9.1.8.b. /
 /0/8/ /

SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMP. SUBCODE	VALVE SUBCODE
/0/9/ /C/J/ (11)	/A/ (12)	/B/ (13)	/V/A/L/V/E/X (14)	/F/ (15)
LER/RO	EVENT YEAR	SEQUENTIAL	OCCURRENCE	REPORT
REPORT		REPORT NO.	CODE	TYPE
NUMBER	/8/2/	/-/	/0/4/1/	/-/
(17)			/0/1/	/X/
				/1/
ACTION	FUTURE	EFFECT	SHUTDOWN	ATTACHMENT
TAKEN	ACTION	ON PLANT	METHOD	FORM SUB.
			HOURS	PRIME COMP. COMPONENT
/X/ (18)	/G/ (19)	/Z/ (20)	/Z/ (21)	/0/0/0/0/ (22)
				/Y/ (23)
				/N/ (24)
				/A/ (25)
				/H/2/3/0/ (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

/1/0/ / The inoperability of the PORV's was due to excessive nitrogen leakage and due to /
 /1/1/ / the nitrogen reservoir isolation valve closure. The isolation valve was reopened /
 /1/2/ / on May 22, 1982 and on May 25, 1982, manual blocks were installed on both relief /
 /1/3/ / valves to provide the required RCS vent path. /
 /1/4/ /

FACILITY STATUS	%POWER	OTHER STATUS	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
/1/5/ /G/ (28)	/0/0/0/ (29)	/ NA / (30)	/A/ (31)	/Operational Event /
ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)	
/1/6/ /Z/ (33)	/Z/ (34)	/ NA /	/ NA /	
PERSONNEL EXPOSURES	TYPE	DESCRIPTION (39)		
/1/7/ /0/0/0/ (37)	/Z/ (38)	/ NA /		
PERSONNEL INJURIES	NUMBER	DESCRIPTION (41)		
/1/8/ /0/0/0/ (40)	/	NA		
LOSS OF OR DAMAGE TO FACILITY	TYPE	DESCRIPTION (43)		
/1/9/ /Z/ (42)	/	NA		
PUBLICITY	ISSUED	DESCRIPTION (45)	NRC USE ONLY	
/2/0/ /N/ (44)	/	NA	/ / / / / / / / / / /	
NAME OF PREPARER		W. R. CARTWRIGHT	PHONE (703) 894-5151	

UPDATED REPORT - Previous Report Date 06-04-82

Virginia Electric and Power Company
North Anna Power Station, Unit No. 1
Docket No. 50-338
Attachment to LER 82-041/01X-1

Attachment: Page 1 of 5

Description of Event

On May 19, 1982 while in Mode 4 at about 0100, the Pressurizer Power Operated Relief Valve (PORV) mode controller key switches were placed in automatic. This provided for the automatic opening of the PORV with nitrogen in the event of an overpressure condition in the Reactor Coolant System with RCS cold leg temperatures equal to or less than 320°F.

At 0300 on May 19, 1982, the nitrogen pressure in the "A" reservoir to one PORV (PCV-1456) decreased to below the setpoint required to maintain the PORV operable (1775 psig or sufficient volume to cycle 120 times with 5 seconds per cycle). This rendered one PORV (PCV-1456) inoperable and the action statement of T.S. 3.4.9.3.a was entered. Attempts were made to restore the one PORV to operable status without success due to excessive nitrogen leakage. Local pressure indication on the redundant PORV nitrogen reservoir (to PCV-1455c) was verified to be greater than the minimum setpoint at this time (1890 psig).

At 1719 on May 22, 1982, the nitrogen reservoir low pressure alarm for the remaining PORV (PCV-1455c) actuated. At 1800 on May 22, 1982, a containment entry was made to repressurize the nitrogen reservoir. The reservoir was repressurized to 1875 psig. It was reported to the Shift Supervisor that two valves were opened to pressurize the reservoir when, normally, a single valve operation would be required to pressurize the reservoir from the nitrogen header inside of the containment. After repressurization, the operator reported that he reclosed the two valves. The controlled system piping drawing 11715-FM-105A-10 was examined and it was determined that a second valve that isolates the nitrogen reservoir from the system was identified by the operator but the valve was not shown on the drawing.

While the second valve was being investigated, at 1910 on May 22, 1982, the low pressure alarm again actuated and another containment entry made at 2023 by two operators. At 2115, it was reported that the nitrogen reservoir from the remaining, operable PORV was isolated from the system due to the isolation valve being closed. The valve was immediately opened and the reservoir pressurized to 1975 psig.

Since the reservoir isolation valve was closed rendering the one PORV (PCV-1455c) inoperable and the other PORV (PCV-1456) had previously been declared inoperable, the T.S. 3.4.9.3.b action statement for two inoperable PORV's was entered.

An extensive examination of the events leading to the reported "closed" position of the reservoir isolation valve was inconclusive. Therefore, these events were determined to be reportable pursuant to T.S. 6.9.1.8.b.

At 1400 on May 25, 1982, both PORV's (PCV-1456 and 1455c) were opened and manually blocked open to provide a vent path of greater than 2.07 square inches.

Probable Consequences of Occurrence

The nitrogen system to the PORV's was installed by design change (78-44) to provide for operating the valves on the loss of instrument air. In addition, provisions were made to operate the valves in the event of a loss of power to the solenoid operated valves in conjunction with the loss of instrument air. With the auctioneered wide range cold leg temperature less than or equal to 320°F, the nitrogen system becomes the only method for opening these valves automatically on an overpressure condition (PORV Key Switch in AUTO.)

The total period of time in the action statement for a single inoperable PORV was approximately 6 days and 11 hours. Engineering evaluation indicated that the time in the action statement for two inoperable PORV's to be 2 hours and 45 minutes. Since either PORV could have been opened manually if required and there was no overpressurization of the reactor coolant pressure boundary during this time, the health and safety of the public were not affected.

In addition, for certain overpressure transients, pressure relief was available thru the two Residual Heat Removal System relief valves (set to lift at 467 psig).

Cause of Event

Excessive leakage from the nitrogen system used to open PCV-1456 caused the first PORV to become inoperative.

The second PORV became inoperable because a nitrogen supply (isolation) valve to PCV-1455C had been closed due to personnel error. Administrative errors were also a contributing factor in that the reservoir isolation valve was omitted from the controlled drawing revision performed by contracted personnel. In addition, formal written procedures or valve line-up sheets had not been provided to the operators although the overpressure protection system is taught in RO and SRO training classes.

There are also several factors related to the improper closure of the supply (isolation) valve. The repressurization of the nitrogen reservoir is normally performed under containment vacuum with full-face respirators and adverse environmental conditions. In addition, the isolation valve for each nitrogen reservoir is located behind the opposite nitrogen reservoir and neither isolation valve had been labeled with a mark number.

Immediate Corrective Action

The reservoir isolation valve was opened and the reservoir pressurized to 1975 psig. The control room piping diagrams were annotated to show the correct piping and a Engineering Work Request submitted for a drawing revision and the assignment of mark numbers.

On May 25, 1982, both PORV's were manually blocked open.

An engineering evaluation was immediately initiated to determine if the valve was open or closed at the time of the second containment entry or if an improper valve line-up had been made at that time. The basis of the evaluation is that, with the reservoir isolation valve closed (isolating the reservoir from the system piping, pressure switch and local indication and from the SOV to the PORV operator) there is insufficient nitrogen in the isolated line to fully stroke the PORV.

- A. In order to establish the last time the PORV was operated with nitrogen (i.e verifying that the valve was open), records relating to the PORV's were examined.

March 29, 1981 Both PORV's were challenged by inadvertently initiating the low pressure safety injection signal during solid water operations. Both PORV's operated properly. Reference LER 81-018.

October 20, 1981 Both PORV's were tested with PT-44.6A and B which uses nitrogen to stroke the valves during the final portion of the test. Reference steps 4.1.11 and 4.1.12 of 1-PT-44.6B for PCV-1455C. Both PORV's stroked in less than 2 seconds.

There were no unit shutdowns to below Mode 3 during the period from the last operability check on the PORV's (1-PT-44.6B on October 20, 1981) until the outage on May 9, 1982.

Conclusion: The B nitrogen reservoir isolation valve was open when the first containment entry was made to repressurize the nitrogen reservoir on May 9, 1982.

- B. The initial entry by an operator to repressurize the nitrogen reservoirs for both PORV's was made during a short outage on May 9, 1982 at 0246. (A = 2050 psig, B= 2000 psig). The PORV key switch was placed in "Auto" mode at 0420 on May 9, 1982. At 1835 on May 9, 1982, both reservoirs were repressurized (A= 1890 psig; B= 1900 psig). No further actions affecting the B nitrogen reservoir were taken for the duration of this outage. Mode 4 entered (heating up to Mode 3) at 0751 on May 13, 1982.

Conclusion: The B nitrogen reservoir valve remained open during this period as evidenced by the systems ability to maintain pressure for a long period of time. If the valve had been mistakenly closed during this period, the short section of piping which includes the penetration for the pressure switch that gives the annunciator alarm (1775 psig) would have depressurized frequently due to system connection leakages that normally exist.

- C. The Unit entered Mode 4 (preparing for refueling outage) at 2302 on May 18, 1982. During this period until the reported "found-closed" position of the B reservoir isolation valve, there were two containment entries made by Operations personnel that affected the PORV's.
1. On May 19, 1982 at 2206, an entry was made to repressurize the A nitrogen reservoir in response to a low pressure alarm. At that time, the operator repressurized both tanks (B= 1890 psig). The operator stated in a subsequent interview, that only two valves were repositioned; the nitrogen fill valve to A reservoir and the nitrogen fill valve to B reservoir. Both of these valves were reclosed when the pressurization was completed.

Conclusion: The B reservoir isolation valve was not repositioned during this containment entry, therefore the valve remained open. In addition, the system pressure in the nitrogen supply to PCV-1455C remained above the low pressure alarm for the next 68 hours. This also indicated that the additional reservoir volume was available.

2. On May 22, 1982 at 1800 another containment entry was made to repressurize B nitrogen reservoir in response to a low pressure alarm. (B reservoir pressurized to 1875 psig). At 1910, approximately 2 hours after the previous low pressure alarm, the alarm reactivated. A containment entry was made by two operators and it was reported that the B nitrogen reservoir isolation valve was closed.

Conclusion: There are several factors that relate to the identification of the time the B reservoir isolation valve was closed.

- a. The operator that initially entered the containment on May 22, 1982 at 1800 reported that two valves required repositioning in order to pressurize the B reservoir. Normally a single valve requires opening. The operator reportedly returned the valves to their initial position.

NOTE: This is the first indication that the B nitrogen reservoir isolation valve was ever manipulated.

- b. It was determined, following the event, that the system drawing (FM-105A) did not show the valve identified by the operator.
- c. The system piping arrangement is unusual and the valve difficult to manipulate especially in respiratory protection equipment. For example, the B reservoir isolation valve is behind the A reservoir. (See attached sketch)

Based on this information there is reasonable assurance that the valve was mistakenly closed at 1800 on May 22, 1982 either by turning the valve in the wrong direction initially or partially opening and fully closing the valve if it was not fully open initially. Therefore, the total time in the action statement was 2 hours and 45 minutes.

Scheduled Corrective Action

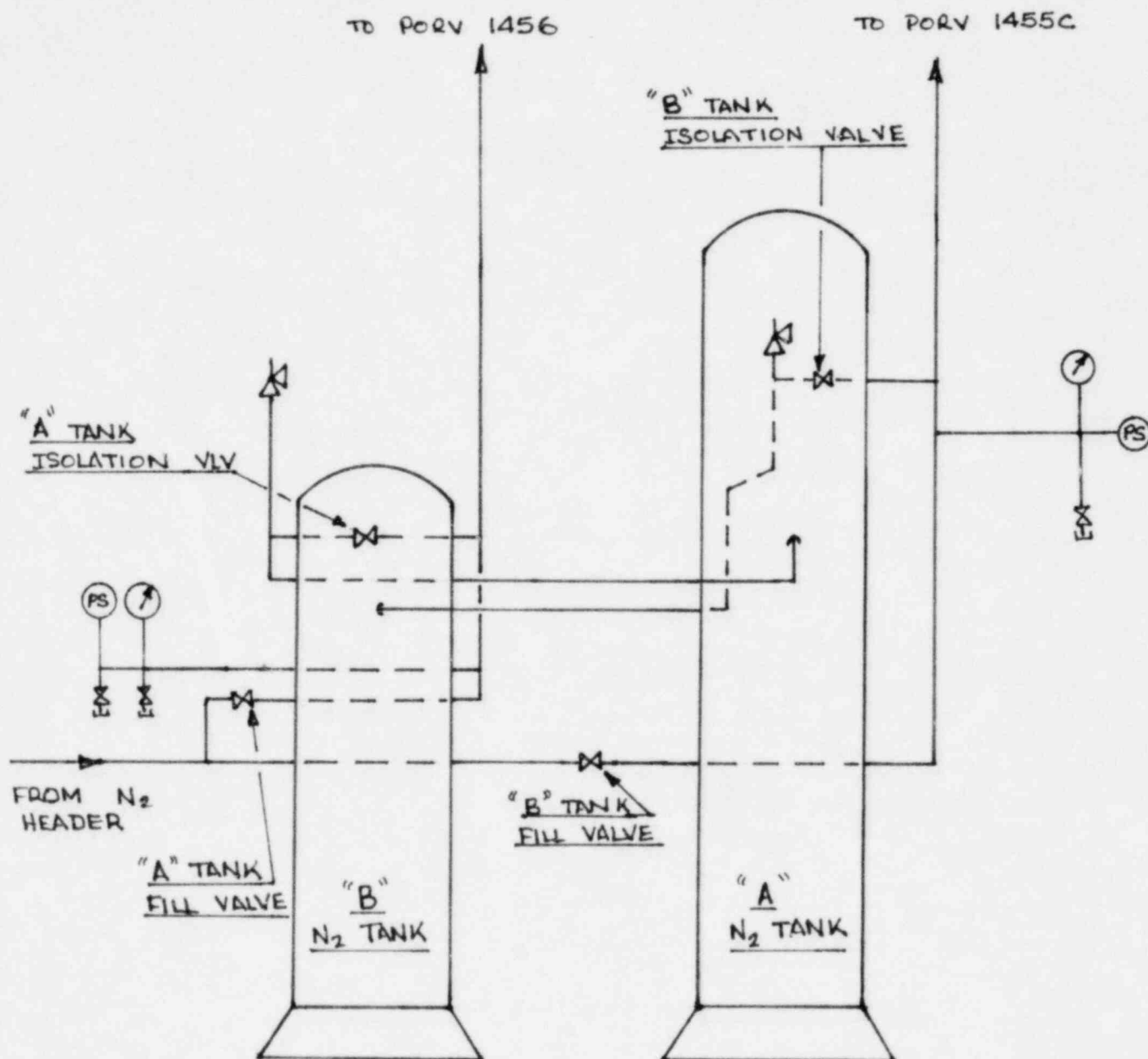
The controlled drawing will be revised.

Actions Taken to Prevent Recurrence

A training handout has been developed and put in required reading for operators, operating procedures and valve line-up instructions have been developed and Control Room drawings have been annotated.

Generic Implications

The piping arrangement is slightly different on North Anna Unit 2 and the drawings were found to be in error. The related problems on Unit 2 were corrected at the same time as the Unit 1 correction.



VIRGINIA ELECTRIC & POWER CO.
Engineering Department

UNIT 1 NITROGEN SUPPLY

D APP. DATE

SCALE

NOT TO SCALE