BIG ROCK POINT

NRC FORM 366
(7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 | MIBRP1 (2) | 0 0 - 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | (5)
LICENSEE CODE | LICENSE NUMBER | LICENSE TYPE | CAT

CON'T
01 | REPORT SOURCE L (6) | 0 5 0 - 0 1 5 5 (7) | 0 9 2 3 8 0 (8) | 1 0 1 2 0 8 0 (9)
DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 | Following investigation and calibration work associated with reactor level
03 | transmitter LT3183 on the reactor depressurizing system, the unit was re-
04 | turned to operable status in a condition such that the trip set point
05 | would be lower than required during a postulated reactor depressurizing
06 | transient. This condition existed for about one hour until removed from
07 | service as allowed by T/S 11.3.1.5.3 for repair of the transmitter on 9/24/
08 | 80. No hazard to the public occurred. Reportable based on T/S 6.9.2b (1).

09 | SYSTEM CODE SH (11) | CAUSE CODE E (12) | CAUSE SUBCODE B (13) | COMPONENT CODE INSTRU (14) | COMP. SUBCODE T (15) | VALVE SUBCODE Z (16)

(17) LER/RO REPORT NUMBER: EVENT YEAR 80 | SEQUENTIAL REPORT NO. 031 | OCCURRENCE CODE 03 | REPORT TYPE L | REVISION NO. 0

ACTION TAKEN A (18) | FUTURE ACTION Z (19) | EFFECT ON PLANT Z (20) | SHUTDOWN METHOD Z (21) | HOURS (22) 0000 | ATTACHMENT SUBMITTED Y (23) | NPRD-4 FORM SUB. N (24) | PRIME COMP. SUPPLIER A (25) | COMPONENT MANUFACTURER W120 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 | The equipment defect associated with this incident as described in the
11 | attachment is the root cause of seventeen previous LERs dating back to LER-
12 | 80-03. The previous reports represented only the removal of a portion of
13 | the RDS system during power operation and the root cause defect did not
14 | result in a non-conservative trip set point on those occasions.

15 | FACILITY STATUS E (28) | % POWER 075 (29) | OTHER STATUS (30) NA | METHOD OF DISCOVERY A (31) | DISCOVERY DESCRIPTION (32) Review of maintenance activity

16 | ACTIVITY RELEASED Z (33) | OF RELEASE Z (34) | AMOUNT OF ACTIVITY (35) NA | LOCATION OF RELEASE (36) NA

PERSONNEL EXPOSURES
17 | NUMBER 000 (37) | TYPE Z (38) | DESCRIPTION (39) NA

PERSONNEL INJURIES
18 | NUMBER 000 (40) | DESCRIPTION (41) NA

LOSS OF OR DAMAGE TO FACILITY (43)
19 | TYPE Z (42) | DESCRIPTION NA

PUBLICITY
20 | ISSUED N (44) | DESCRIPTION (45) NA | NRC USE ONLY

8010230399

Attachment to LER 80-031-03L-0
Consumers Power Company
Big Rock Point Plant
Docket 50-155

The following chronology describes events related to this LER and prior LER #80-03, 80-05, 80-06, 80-08, 80-10, 80-12, 80-14,80-15, 80-16, 80-17, 80-21, 80-24, 80-25, 80-26, 80-27,80-28 and 80-32.

On January 23, 1980, a fault occurred in the Reactor Depressurization System (RDS) auto-test circuitry indicating a potential problem in the reactor vessel level bistable trip unit and/or associated circuitry. Troubleshooting by the plant Instrument and Control (I&C) group revealed no significant failure in the equipment other than minor, conservative drift in the reactor water level transmitter calibration for Channel D (LT-3183). The minor drift downward in output current was enough to allow the fluctuations in level from the level transmitter to trigger the auto-test fault circuitry. However, the signal levels were not low enough and of sufficient duration to trip the bistable unit. Also, coupled with this, is the fact that as the reactor power increases, the two phase mixture above the core changes, increasing the void fraction. With the setpoint change that occurred in the fall of 1979, due to the modifications to the sensing chambers, the actual operating level at higher power levels approached the trip setpoint with very little margin (approximately 1.2" H_2O).

Subsequently, every time the auto-test fault alarms returned, the I&C group was requested to recheck the calibration of LT-3183. At times, minimal drift in the conservative direction was found; at other times, no help was provided by the calibration check. The only alternatives then were to: 1) try to maintain the sensing element reference leg as hot as possible without exceeding 250F and 2) reduce reactor power to decrease the void fraction, thus increasing the density (and indicated level) of the two-phase mixture above the core.

As the length of the operating cycle continued, the transmitter output continued to decline in relation to a comparable reading on RDS Channel "C" (LT-3182) and also on the Reactor Depressurization System Level Switches (LS-RE09 C&G) connected to the same sensing lines. The behavior was not easily understood, as the calibration checks performed by I&C revealed very little drift. This drift was assumed to be in the electronic components of the level transmitter.

In July of 1980, a Technical Specification change was requested and Amendment 34 to the plant Technical Specifications was granted, rescinding the over-conservative setpoints issued in Amendment 31.

By the time the revised setpoints were implemented, plant output was down to less than 50 MWe due to reduced level indication on RDS Channel "D". Lowering the setpoints allowed a return to a greater power level. However, plant output was still limited to slightly over 60 MWe. This was due, of course, to the increase in void fraction, changing the two-phase mixture above the core and as a result, lowering the indicated level as reactor power increased. At this point, disparity between the comparable RDS Channels (C&D) was recognized; and, if the level on RDS Channel "D" was true, tripping of the Reactor Protection System Channel connected to LS-RE09C should have occurred because the setpoint change allowed in Amendment 34 had not been implemented on these instruments (refueling outage work).

A study of the calibration checks and history of the problems was performed. The study revealed that the drift was not time dependent and it could be postulated that each time the transmitter was removed and restored to service, a change in calibration occurred. From this evaluation, it was determined that the differential pressure capsule was defective, the sealing diaphrams were either leaking or distorted and that the static pressure changes between atmospheric pressure (required for the calibration checks) and operating pressure of 1350 psia was creating a calibration shift each time the transmitter was removed and returned to service. The vendor was contacted and could not provide any technical assistance for resolving the transmitter problem. Their representative still felt the problem could be in the electronic bridge circuit and could be caused by aging of components. Consumers Power Company personnel did not feel this was the problem as the drift was not time dependent.

The I&C group was requested to perform a static alignment check on the transmitter. This test was performed on Tuesday, September 23, 1980 with the following results:

> Following removal from service, the calibration of the transmitter was checked. Again, minor drift in the conservative direction was found. After the transmitter was calibrated, zero differential pressure was applied resulting in full output (nominal 5.0 volts, actual 4.83 volts). An offset of 25% was applied by adjusting the zero calibration potentiometer to 4.0 volts. The instrument was vented to remove all air, the bypass valve left open to maintain zero differential pressure on the capsule and operating pressure was applied to the transmitter through the low side sensing valve with the high side closed. The voltage reading decreased to 2.82 volts; after 38 minutes the voltage had stabilized at 2.79 volts. This indicated a drift of $\frac{4.00 - 2.79}{4.00} \times 100 = 30.25\%$. At this point, the output was restored to 4.83 volts, i.e., the voltage required for zero differential pressure. The transmitter was placed in service and indicated a level comparable to RDS Channel "C" and also comparable t • indicated level on the Reactor Protection System level switches nected to the same sensing lines.

Following functional testing of the RDS channel, an operability declaration was made. Subsequently, a review of the maintenance activities revealed that the level transmitter could not maintain its calibration during a depressurization; the drift in this case would be non-conservative and that the channel should be declared inoperable. (Operability had been declared for one hour on the channel.)

Based on the static alignment check, the decision was made to replace the capsule in the Westinghouse Model 59DP4C99-7050 differential pressure transmitter.

The transmitter was removed from service, bench repaired, tested for both static alignment and calibration; installed and retested for static alignment and calibration. No zero shift occurred with the new capsule. The unit was declared operable at 0831 hours on 9/24/80.

With the corrections to the defective level transmitter and the lowered setpoint provided in Technical Specification Amendment No. 34, operability should not be a problem. To prevent recurrence of a problem of this nature, the I&C group has revised their instrument calibration procedures to perform a static alignment check on the RDS level transmitters when the instrument calibration is performed at each refueling outage.