Consumers
Power
Company

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COPY

July 31, 1980

Mr James G Keppler
Office of Inspection and Enforcement
Region III
U S Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT - RESPONSE
TO ITEMS 2 & 3 OF IE BULLETIN
NO 80-17 - FAILURE OF 76 of 185
CONTROL RODS TO FULLY INSERT DURING
A SCRAM AT A BWR

IE Bulletin No 80-17, "Failure of 76 of 185 Control Rods to Fully Insert During a Scram at a BWR", dated July 3, 1980, required scram testing in accordance with Item 2 of the Bulletin to be completed within twenty (20) days of July 8, 1980, (Bulletin clarification dated July 7, 1980). In addition, verification of functional venting and absence of water in the Scram Dump Volume (SDV) was required by Item 3 of the Bulletin.

Consumers Power Company completed the required manual and automatic scram tests on July 24, 1980, and July 25, 1980, respectively. The tests were conducted with more than 50 percent of the control rods fully withdrawn. Specific responses to the Bulletin requirements are provided for Items 2 and 3 by the attachment.

Some significant features of the Big Rock Point design should be understood when evaluating the results. The active SDV is totally within the Scram Dump Tank (SDT) having a 175 gallon capacity which is in excess of two full scram discharge quantities. The SDV piping is maintained water filled at all times due to a loop seal immediately ahead of SDT inlet. The SDT instrumentation provides a continuous monitor on water level. The system has a built-in safety feature of a high level alarm annunciator near the bottom of the tank (approximately 2" from the bottom) to ensure no appreciable water exists in the tank and as a backup to the "alarm" utilizes a high dump tank "scram" which places a trip into the Reactor Protection System when the tank is approximately one-half full (5/16" below centerline) thus unequivocably ensuring adequate margin for scram water is available. The high level scram feature precludes resetting the safety system in the "run" or "refuel" modes with an inappropriate amount of water in the tank.

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The results of the tests verify that the control rods can be scrammed completely from a full out condition, the SDT sizing is more than adequate, and the SDT vents and drains function properly.

This response was delayed for one day to meet with the NRC personnel at Region III to discuss these results and the as-built system. Mr Duane Boyd, of your staff, was informed of the delayed and accepted it based on our attendance at the July 30, 1980, meeting.

David P Hoffman (Signed)

David P Hoffman
Nuclear Licensing Administrator

CC Director, Office of Nuclear Reactor Regulation
Director, Office of Inspection and Enforcement
NRC Resident Inspector - Big Rock Point Plant

Attachment (4 pages)

CONSUMERS POWER COMPANY

Big Rock Point Plant

IE Bulletin 80-17

Docket 50-155
License DPR-6

At the request of the Commission and purusuant to the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974, as amended, and the Commission's Rules and Regulations thereunder, Consumers Power Company submits our response to Items No 2 & 3 of IE Bulletin 80-17, dated July 3, 1980, entitled, "Failure of 76 of 185 Control Rods to Fully Insert During a Scram at a BWR". Consumers Power Company's response is dated July 31, 1980.

CONSUMERS POWER COMPANY

By R C Youngdahl (Signed)
R C Youngdahl, Executive Vice President

Sworn and subscribed to before me this 31st day of July, 1980.

Linda K Carstens (Signed)
Linda K Carstens, Notary Public
Jackson County, Michigan
My commission expires June 10, 1981

(SEAL)

BIG ROCK POINT PLANT

IE BULLETIN NO 80-17, ITEMS 2 & 3

SCRAM TEST RESULTS

Item 2

Within the next 20 days, perform one manual and one automatic scram in that order at normal operating temperature and pressure and with more than 50 percent of the rods fully withdrawn, and obtain the following information on each scram:

Response to Item 2

The specified manual and automatic scrams were performed on July 24, 1980, and July 25, 1980, respectively. Results of these tests indicate that the scram system including the discharge volume function as designed.

Item 2 a

All rod insert times and as many individual rod scram times as practicable.

Response to Item 2 a

All rods were timed on the insert scram stroke via three methods: stop watch, video tape and 35mm camera. The two stop watches caught "all rods in" in the 1.8 and 2.1 seconds, well within the $\leq$ 2.5 second Technical Specifications criteria. Initial rerun of video tapes show all rods were fully inserted well within the Technical Specifications limit of $\leq$ 2.5 seconds. The camera film has been developed and the first scram test is out of focus and is unusable. The second scram (auto initiative) shows all rods full in $\leq$ 2.00 seconds; again within the Specifications. Seven individual rods were also timed using strip chart records and all were within Specifications.

Item 2 b

Voltage at the scram solenoid valve buses to verify that these solenoids are de-engerized upon receipt of scram signal.

Response to Item 2 b

Voltage at the scram solenoid valve buses was monitored in each of the two cases and the voltage reduced/fell to zero as required upon scram initiation. This measurement was made via a voltmeter (digital) at the Reactor Protection System (RPS) terminal strips as well as verified by "off-set pens" on the RPS Events Recorder.

Item 2 c

Verify that scram valve air is relieved through the backup valves and that the backup valves are fully open and remain open during the presence of a scram signal.

Response to Item 2 c

Air pressure was verified to be relieved from the master scram solenoid valves and the valves were also verified to remain open for the duration of the scram. This was done by an Auxiliary Operator stationed at the valves witnessing ribbon movement in the discharge air stream as well as holding his hands on the solenoids to ensure deactivation (this was easily detected).

Item 2 d

Measure fill time of the instrument volume from scram initiation to closure of the scram instrument volume high level alarm switch, to closure of the rod withdraw block switch on the instrument volume and to the closure of the scram instrument volume reactor scram switch.

Response to Item 2 d

The time required for the scram dump tank volume to fill to the a) high level alarm point, and b) the SDT high level scram point was measured. For the manual scram, the times were 9.83 seconds for the high level alarm and 60.48 seconds for the high SDT level scram comparing very favorably with the automatically initiated scram times of 10.19 seconds for the high level alarm and 53.51 seconds for the high level scram. Also timed were the sequence of all four of the Reactor Protection System scram sensor switches on the SDT. In each case, the time from the first switch to open to the last switch to open was five (5) seconds. This is consistent with the plant's routine Surveillance Test Procedure acceptance criteria, $<10\%$ of total time.

Item 2 e

Measure vent and drain valves opening and closing times utilizing the valve stem mounted switches. This measurement may be made independent of the scrams.

Response to Item 2 e

The SDT vent and drain valve opening and closing times were measured while being actuated by the remote manual hand switch in the control room. The closing time was 45 seconds and the opening time was approximately one (1) second. This test was made, as the Bulletin allows for, prior to the actual scram tests.

Item 2 f

Measure the delay time from scram initiation to closure of the SDV vent and drain valves utilizing the stem mounted position switches.

Response to 2 f

The delay time from scram initiation to the closure of the SDT vent and drain valves was measured during the scram tests. This was done by an operator in the control room timing with a stop watch the valve position indication lights which are actuated from the valve stem-mounted switches. Time of closure (both valves are served by one set of lights) during the manual scram was 15.7 seconds and following the automatic scram was 17.2 seconds.

Note: This closing time differs from that measured in (e) above as the solenoid air discharge path is not the same for the two features.

Item 2 g

Sample water from the instrument volume discharge after each scram for particulates.

Response to 2 g

Water samples were taken from the scram discharge volume after both scrams; following the manual (first) scram, the water as expected was very discolored from months

(some seven months) of continuous reactor operation with no scram initiated to cleanse the piping and tank. The sample following the automatic scram was predictably more clear. Some four (4) gallons of water were collected during each drain cycle. The suspended solids were 205 ppm for the manual scram sample and 13.6 ppm for the automatic scram sample.

Item 2 h

Measure the time to drain the SDV down to a repeatable reference level.

Response to Item 2 h

The time to drain the SDT volume down to a repeatable level was verified. When the RPS is reset, the scram annunciator immediately clears for the "SDT high level scram". The time from drain initiation to the clearing of the "high level alarm" was three (3) minutes, 57 seconds for the manual scram and three (3) minutes, 52 seconds for the automatic scram with a tank emptying time of four (4) minutes, 25 seconds and four (4) minutes, 23 seconds, respectively.

Item 2 i

Monitor the SDV and associated piping for residual water.

Response to Item 2 i

The Scram Dump Tank (SDT) volume was monitored for residual water prior to the scram tests and after each of the two tests. Radiographic methods were used as the tank thickness and geometry prohibited the use of the ultrasonic techniques. The tank was verified to be empty in each case.

Note: The Big Rock Point design is such that the SDT volume is sized adequately to accept two full scrams and the SDT high level scram switch locations ensure this feature to be available when needed. Also, the dump tank headers are designed to be full of water via a loop seal at the entrance to the SDT.

Item 2 j

Verify that the ten (10) seconds delay on scram reset is functioning properly to prevent resets of momentary scram signals.

Response to Item 2 j

The ten seconds time delay on scram reset is not designed into the Big Rock Point system and is not applicable to this test. This was verified with NRC Region III personnel as well as the Resident Inspector.

Item 2 k

Compare the results of the two sets of data taken above with each other and with any previously obtained data.

Response to Item 2 k

The results of the data were compared with each other as well as to data previously obtained. Agreement seems to be good in each case and no discrepancies were noted.

Item 3

At the conclusion of the scram tests and all other scrams, verify that all vent lines on the SDV are functional. Verify that there is no significant amount of water in the SDV and associated piping.

Response to Item 3

At the conclusion of each scram test, when venting and draining of the SDT was initiated, the vent line was verified to be open and functional. This was evidenced by the discharge of water from the vent for a short period (few seconds) and the position of the vent valve stem indicating an open valve. The SDT was verified to be empty via the radiographic method discussed in Item 2 i above.

The daily check for water in the SDT was performed after each scram test and continues as prescribed in Bulletin Item No 5 and Supplement No 1.