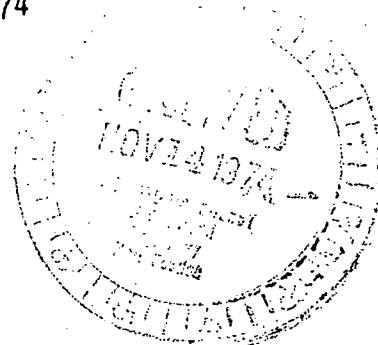


BBS Ltr.#812-74

Dresden Nuclear Power Station
R. R. #1
Morris, Illinois 60450
November 12, 1974

Mr. James G. Keppler, Regional Director
Directorate of Regulatory Operations-Region III
U. S. Atomic Energy Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137



SUBJECT: REPORT OF ABNORMAL OCCURRENCE PER SECTION 6.6.A OF THE TECHNICAL SPECIFICATIONS
FAILURE OF CONTROL ROD DRIVES TO FULLY INSERT ON A SCRAM

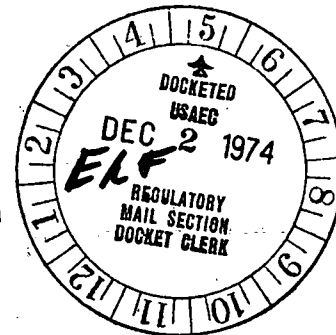
- References: 1) Regulatory Guide 1.16 Rev.1 Appendix A
- 2) Notification of Region III of AEC Regulatory Operations
Telephone: Mr. P. Johnson, 1130 hours on November 3, 1974
Telegram: Mr. J. Keppler, 1350 hours on November 4, 1974
- 3) Drawing Number: M-34

Report Number: 50-237/1974-58

Report Date: November 12, 1974

Occurrence Date: November 2, 1974

Facility: Dresden Nuclear Power Station, Morris, Illinois



IDENTIFICATION OF OCCURRENCE

On November 2, 1974, after a scram on Dresden Unit 2, numerous control rods (93) stopped at position 02 and one control rod, F-6 stopped at position 04 and two control rods, H-9 and G-8, stopped at position 06. The stopping of control rods F-6, H-9 and G-8 at a position greater than 02 upon a scram represents a condition which could have prevented the performance of the intended safety function of an engineered safety feature of the reactor protection system.

CONDITIONS PRIOR TO OCCURRENCE

At 0238 hours on November 2, 1974, Unit 2 scrambled from a power level of 450 MWe and 1460 MWh due to low water level in the reactor.

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DESCRIPTION OF OCCURRENCE

On November 2, 1974 at 0328 hours, Dresden Unit 2 scrambled due to a low water level in the reactor. After the scram occurred, the reactor operator noted that numerous control rods had stopped at position 02, position 00 being fully inserted. Additionally, the operator noted three control rods which inserted to position other than 00 or 02. These control rods were H-9 at position 06, G-8 at position 06 and J-6 at position 04. The operator then sank all control rods to position 00 by inserting them one-at-a-time.

DESIGNATION OF APPARENT CAUSE OF OCCURRENCE

At this time, the apparent cause of the occurrence is not absolutely known. A possible cause of the occurrence is excessive leakage past the seals of the control rod drives. The piping to the scram discharge volume is overloaded thus reducing the differential pressure driving the control rod into the core. This differential pressure reduction caused the three control rod drives to stop short of position 00 or 02. Analyses are being done to determine the cause of this occurrence. A followup letter will be written when all analyses are complete.

ANALYSIS OF OCCURRENCE

There were no safety consequences to the public or plant personnel as a result of this occurrence because: (1) the control rods performed as required in that they shut down the reactor upon the scram signal; and, (2) an additional engineered safeguard system, the boron injection system, was operational and available for use in event the control rods had not shut down the unit.

Control rods stopping at 02 has been previously observed, the cause of this condition has been identified, and the condition analyzed (Deviation Report D12-2-74-42). However, the analysis specifically excluded the possibility of any control rods stopping at positions greater than 02.

Although the stopping of the three control rod drives at position greater than 02 is by itself an abnormal degradation of a reactor protection system, the condition which caused the problem, degradation of the control rod seals and consequent increased seal leakage, is gradual in nature. This is reflected directly in a decreased time for the scram discharge volume high level alarm to occur upon a scram. A review of plant data shows that the time from the scram to the scram discharge volume high level alarm has decreased from 32 seconds on 12-31-72 to 8 seconds on 9-3-74 and 7 seconds on 11-2-74. This slow deterioration of the control rod drive seals will eventually result in just the occurrence which is under discussion, namely some control rods with the slowest scram times will eventually stop at a position greater than 00 or 02.

If the unit had been operated for a significant period of time beyond this occurrence, further degradation in the control rod drives could be expected and a greater number of control rods might remain partially inserted after a scram and, at further distance from 00. Because of the gradual nature of the increase of the control rod drive seal leakage, adequate warning is always available and corrective steps can be taken.

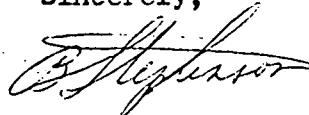
CORRECTIVE ACTION

When appropriate management personnel were made aware of the nature of the occurrence, Unit 2 was well into the scram recovery procedure. The unit was critical and within 100°F of rated temperature. The decision was made at that time to continue to rated temperature and pressure for testing of the three affected control rods. Scram and friction testing was conducted during the day of November 2, 1974 and at approximately 2200 hours, the decision was made to shut down Unit 2. The unit was placed in shutdown at 0650 hours on November 3, 1974, and began its third partial refueling outage at that time. Plans for outage work include the overhauling about 125 of Unit 2's control rod drives. Additional corrective actions are being investigated at this time and will be reported in a followup letter.

FAILURE DATA

These are the first occurrences of this type.

Sincerely,



B. B. Stephenson
Superintendent

BBS:JD:do