



LICENSEE EVENT REPORT

EXHIBIT A

LER No. 50-313/83-024/03L-0

Occurrence Date: 09/26/83

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (Continued)

cutoff due to increasing tilt. To dampen the tilt, power was reduced using rods. Local flux perturbations later caused this quadrant power tilt to exceed the limits of the Technical Specifications. The reactor was returned to 100% FP on 9/27/83. An evaluation performed by B&W concluded that no safety criteria were exceeded, nor were the requirements on ejected rod worth or shutdown margin violated. This occurrence is reportable per T.S. 6.12.3.2.b. Another occurrence regarding CRA misalignment (dropped rod) was reported in LER (50-313) 82-020.

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (Continued)

detailed followup investigation was performed following the event to determine the sequence of events. On 9/11/83, a reactor startup was performed. Criticality was achieved with Group 7 rods at 27%. Spurious position indication of CRA 7-10 was noted (sporadically dropping to 0% then returning to normal). This was attributed to sticking reed switches and the power escalation continued. At a group average of 50%, CRA 7-10 indicated 50% by Absolute Position Indication (API) and its 50% zone light was checked "ON". These checks confirmed CRA 7-10 alignment with the group. At about 60%, CRA 7-10 API indication again became erratic, dropping about 10% momentarily then returning to alignment with the group. This was again attributed to a sticking reed switch. A computer printout at approximately 2300 hours on 9/13/83 showed CRA 7-10 position at 83.3%. The group average at that time was 89.3%. A 6% misalignment results in an 8.4" misalignment. Therefore, at that time TS compliance was met. At about 11:00 a.m. on 9/14/83, an asymmetric fault occurred on Group 7 with CRA 7-10 indicating 75% (API). The 75% zone light was checked and did not come in. The I&C Department confirmed the (API) signal coming from the Reactor Building agreed with Control Room indication. These checks confirmed the position indication problem to be in the Reactor Building. Since previous problems with API reed switches were known and these switches are inaccessible at power, the reed switches were suspected of being the problem. Nuclear Engineering was informed of the indication problem and performed Procedure 1302.15, "Core Performance Monitoring." This procedure indicated no significant core power distribution change. Based on this information, the asymmetric fault alarm function of CRA 7-10 was bypassed. It should be noted that no safety function was bypassed. Apparently, on 9/14/83, as CRA 7-10 became further misaligned with its group, a concurrent failure of a reed switch caused CRA 7-10 API to degrade to 75%. The rod could not be located with its zone switch because its true position was 81% from a computer printout at 1352 hours. During the following days, the rod apparently continued its inward drift at about 3 to 4% per day at steady state plant conditions and apparently at some accelerated rate during the down-power and up-power maneuver (from 9/16 to 9/21). This accelerated rate of misalignment would be expected due to the additional rod motion involved with plant maneuvering. On 9/15/83, at about 2300 hours, another computer printout of rod positions placed CRA 7-10 at 74.5% and a group average of 88.4. On 9/21/83, CRA 7-10 position had decreased sufficiently to lower the group average and cause most of the rods in Group 7 to become asymmetric. A calculation of the CRA 7-10 position required to cause that group average to decrease to 84% results in an approximate position of 43%. CRA 7-10 API position was observed to be approximately 39% on 9/22, approximately 36% on 9/23 and approximately 27% on 9/26. CRA 7-10 is located at grid H-6 which is located on the east-west axis 2 assemblies out from the core center. The rod's location tended to mask its actual position in that core tilt did not change as much as might have been expected had the rod been more centrally located within a specific quadrant. Nuclear Engineers performed Procedure 1302.15, "Core Performance Monitoring," on 9/14/83 and 9/16/83. A "Periodic Core Power Distribution" procedure was performed on 9/16/83. Based on the results of these tests and other undocumented checks of various computer printouts during the week of 9/18 - 9/24, the Nuclear Engineers reported no abnormal core power distribution. CRA 7-10 apparently became misaligned from its group average by greater than 9 inches between 0000 and 2400 hours on 9/14/83 (T.S. 4.7.1.2). An inoperable rod requires various actions defined in T.S. 3.5.2.2 (2, 4, 5, 6). These actions were not performed because the rod was not believed to be inoperable. Available shutdown margin calculations were made following the return of CRA 7-10 to its group average position. These calculations assume CRA 7-10 to be inoperable in its fully withdrawn position (even though while it was inoperable, it was inserted up to 27%) and show that the requirement for an available shutdown margin  $\geq 1\%$   $\Delta K/K$  did exist. The requirement for control rod exercising of all remaining rods (T.S. 3.5.2.2.4) was not performed because the rod was not believed to be inoperable. A routine CRD exercise was, however, performed on 9/15/83, and no rods were identified as inoperable. The requirement for reducing power to less than 60% was not performed because the rod was not believed to be inoperable. When the rod was identified as misaligned, it was returned to alignment in less than one hour. Local flux perturbation after the realignment of the rod resulted in a high quadrant power tilt near the rod. During the rod withdrawal, power reduction commenced while monitoring adjacent fuel power. After realigning the rod, power reduction continued to below the power level cutoff due to increasing tilt. To dampen the tilt, power was reduced using rods. Also, feedwater flows were adjusted to minimize the tilt. CRA 7-10 drive mechanism will be repaired/replaced during the next outage of sufficient duration. Also, the CRD malfunction procedure will be revised to provide additional guidance for determining rod position and to better address recovery of misaligned CRA's. In addition to current position checks using API, additional special checks for CRA 7-10 are being performed periodically. The position of CRA 7-10 is being adjusted as necessary to maintain an acceptable relation with the group average.



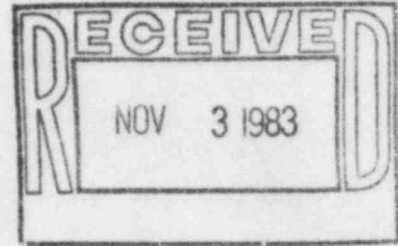
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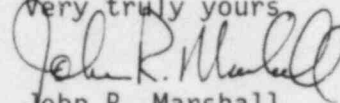


Subject: Arkansas Nuclear One - Unit 1  
Docket No. 50-313  
License No. DPR-51  
Licensee Event Report  
No. 83-024/03L-0

Gentlemen:

In accordance with Arkansas Nuclear One - Unit 1 Technical Specification 6.12.3.2.b, attached is the subject report concerning Control Rod Assembly (CRA) misalignment.

Very truly yours,

  
John R. Marshall  
Manager, Licensing

JRM:RJS:s1

Attachment

cc: Mr. Richard C. DeYoung  
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