

LER No. 50-368/82-030/01T-0

Attachment

Cause Description and Corrective Actions (Continued)

guide tube post to provide additional shoulder gap for batch 'C' fuel. The anomaly and design change will be discussed with NRC representatives in a meeting presently scheduled for 10/06/82.

REPORTABLE OCCURRENCE REPORT

- 1. Reportable Occurrence Report No. 50-368/82-030/01T-0
- 2. Report Date: 10/6/82
- 3. Occurrence Date: 9/22/82
- 4. Facility: Arkansas Nuclear One - Unit 2
Russellville, Arkansas

5. Identification of Occurrence:

The clearance between the top of the fuel rods and the bottom of the upper flow plate on certain batch C fuel assemblies may not be sufficient to prevent pin contact during the next fuel cycle (Cycle 3). This occurrence is reportable per T.S. 6.9.1.8.i.

6. Conditions Prior to Occurrence:

Steady-State Power _____	Reactor Power _____ 0 _____ MWth
Hot Standby _____	Net Output _____ 0 _____ MWe
Cold Shutdown _____	Percent of Full Power _____ 0 _____ %
Refueling Shutdown _____ X _____	Load Changes During Routine Power Operation _____
Routine Startup Operation _____	
Routine Shutdown Operation _____	
Other (specify)	

Reactor defueled completely, fuel inspections being conducted in spent fuel pool.

7. Description of Occurrence:

As a result of fuel inspections underway during the ANO-2 refueling outage, we have observed that the clearance between the top of the fuel rods and the bottom of the upper flow plate on certain batch C fuel assemblies may not be sufficient to prevent pin contact during the next fuel cycle (Cycle 3).

REPORTABLE OCCURRENCE REPORT

Reportable Occurrence No. 50-368/82-030/01T-0

8. Designation of Apparent Cause of Occurrence:

Design	<u> X </u>	Procedure	<u> </u>
Manufacture	<u> </u>	Unusual Service Condition Including Environmental	<u> </u>
Installation/ Construction	<u> </u>	Component Failure	<u> </u>
Operator	<u> </u>		

Other (specify)

The design models used by CE to predict fuel pin growth underpredicted the actual fuel pin growth. Also the annealed guide tubes grew at a lesser rate than predicted. The combination of these factors led to an inadequate shoulder gap for certain batch C fuel assemblies.

9. Analysis of Occurrence:

Measurements of several ANO-2 batch C fuel assemblies performed during the current refueling outage indicate insufficient space within the fuel assembly structure to accommodate additional axial fuel growth during cycle 3 operation. Consequently, a recommendation was made to perform a modification to affected fuel assemblies to provide additional margin for fuel growth.

Preliminary information from the fuel vendor indicated that the modification would be appropriate for implementation with 10 CFR50.59 considerations.

The modifications were evaluated and judged to be acceptable from the fuel handling standpoint, therefore, modifications were initiated.

Subsequent analysis supported fuel modification per 10 CFR50.59 and subsequent reuse upon successful completion and fuel vendor certification.

Details are scheduled to be presented to NRC representatives in a 10/6/82 meeting.

REPORTABLE OCCURRENCE REPORT

Page 3 of 4

Reportable Occurrence Report No. 50-368/82-030/01T-0

10. Corrective Action:

Modifications to some fuel assemblies in batch C to increase the available shoulder gap (gap between the upper end caps on the fuel rods and the bottom of the flow plate).

Sufficient remaining shoulder gap will be the screening criterion for evaluation of the batch C assemblies. Batch C assemblies requiring modification will be examined in the following manner: Remaining shoulder gap sizes on peripheral rods on two opposing faces of each batch C assembly will be measured. In addition, a survey of the interior rods will be conducted to determine if any visible interior rod exhibits a smaller remaining gap than the smallest peripheral shoulder gap. The acceptability of the assemblies will initially be determined by comparing the measured gap size for each of these rods to a conservative screening criterion.

The screening criterion, developed from observations from cycle 1 and cycle 2 fuel performance, considers shoulder gap closure as a function of individual rod fluence. It is considered to be conservative for the following reasons:

- It is based on a sample taken from those assemblies which appear to have experienced the greatest shoulder gap closures, with an additional allowance to reflect variations in the data.
- It presumes no deceleration of the phenomenon in cycle 3.
- It takes no credit for expected reductions in individual rod powers for cycle 3.

Furthermore, an additional conservative allowance is applied to the rod-specific screening criterion to provide a very high degree of confidence that contact will not occur prior to the termination of cycle 3.

The screening criterion will be applied to the measured rods on a rod-by-rod basis to identify assemblies that are clearly acceptable (no rods exceeding the screening criterion). For those assemblies which violate the screening criteria, a statistical examination of the growth trends in that assembly will be conducted. If, on the basis of this detailed review, the assembly is deemed to have a high assurance of adequate performance during cycle 3 the assembly may be accepted without modification. Remaining assemblies will be modified.

REPORTABLE OCCURRENCE REPORT

Page 4 of 4

Reportable Occurrence No. 50-368/82-030/01T-0

10. The modification will consist of installing 'shims' between the control element assembly (CEA) guide tubes and flow plate using a modified CEA guide tube post to provide additional shoulder gap for batch C fuel assemblies for Cycle 3 exposure. Batch D and batch E fuel assemblies have additional shoulder gap per a change in design to accommodate higher expected fuel assembly exposure. Cycle 3 operation consists of batch C, D, and E fuel.
11. Failure Data: No failure occurred.