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BBS Ltr. #77-268

March 31, 1977

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

SUBJECT: Follow-up Report to Abnormal Occurrence Report Entitled "Off-Gas Increase on Unit-3"

REFERENCE: Letter from B. B. Stephenson to J. G. Keppler (A. O. report no. 50-249/75-44) dated December 11, 1975

REPORT NUMBER: 50-249/75-44A

REPORT DATE: March 31, 1977

OCCURRENCE DATE: November 25, 1975

FACILITY: Dresden Nuclear Power Station, Morris, Illinois

INTRODUCTION

The referenced Abnormal Occurrence report described the Unit-3 off-gas activity increase discovered on November 25, 1975. At that time, the cause of the off-gas activity increase could not be definitively established, although limited degradation of the fuel cladding was considered a probable factor. As stated, an investigation was initiated, the results of which were to be submitted in a follow-up letter.

This investigation has been satisfactorily concluded, and the subject follow-up report is being submitted in accordance with the Dresden Nuclear Power Station Technical Specifications, Section 6.6.B.

INVESTIGATION AND RESOLUTION

In November, 1976, General Electric and Edison personnel visually inspected six fuel assemblies that had been determined to be defective at the end of cycle 4. During this visual inspection, a major defect was discovered in fuel assembly DD-418. The defect, which was confined to fuel rod A-3, was located immediately above and below the second fuel assembly spacer from the bottom.

Below the spacer, the defect appeared as a longitudinal crack in the cladding approximately 6 inches long. Above the spacer, the defect consisted of numerous longitudinal splits in the cladding, with an approximately inch-long section completely devoid of cladding. There was no evidence of any fuel in this inch-long section.

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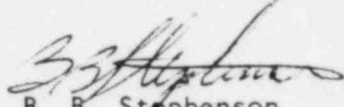
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INVESTIGATION AND RESOLUTION (Continued)

It is believed that this single defective fuel rod caused most or all of the off-gas activity increase of November 25-26, 1975. The defect apparently originated below the spacer, with the splitting above the spacer resulting from secondary hydriding of the cladding over a period of time. Through-wall hydride formation was then followed by erosion of the exposed UO₂ fuel pellet(s). Secondary hydriding has been observed before in the BWR fuel rods at Dresden, but never to the extent evinced by this particular fuel rod.

Since assembly DD-418 was situated in the extreme periphery of the core during cycle 4, operations during that cycle could not have caused the primary defect observed. It appears most probable, therefore, that this defect is related to cycle 3 operations, and in particular to the event of October 31, 1974. It is believed that the defect either developed during cycle 3, or was initiated during that cycle, and propagated through the cladding wall during cycle 4 operations.

Fuel assembly DD-418 has already been permanently removed from the reactor. No further corrective action is anticipated at this time.


B. B. Stephenson
Station Superintendent
Dresden Nuclear Power Station

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