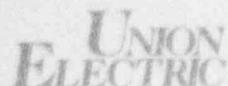


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January 6, 1994

U.S. Nuclear Regulatory Commission  
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Gentlemen:

ULNRC-2933

CALLAWAY PLANT  
DOCKET NUMBER 50-483  
REFUEL 6 FUEL INSPECTION RESULTS

On December 14, 1993 a telecon was held between the NRC, Westinghouse and Union Electric to provide the results of fuel inspections conducted during Refuel 6. As a follow-up to that telecon, the attached inspection results summary is provided.

Very truly yours,

A handwritten signature in cursive ink, appearing to read "A. C. Passwater".

A. C. Passwater

DS/plh

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G PDR

A handwritten mark or signature in the bottom right corner of the page.

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## **CALLAWAY PLANT - REFUEL 6 FUEL INSPECTION RESULTS**

In October, 1993, the Callaway Plant performed fuel inspections on the entire core using both in-mast sipping and ultrasonic testing (UT) techniques. In-mast sipping identified two failed assemblies, H79(once burned) and G75(twice burned). The UT inspection indicated one failed rod in G75 and five "suspect" rods in H79. No definitely failed rods were identified by UT in H79. In addition, the UT exam found one failed rod in assembly G86(twice burned). This assembly had passed the in-mast sipping inspection.

Bottom nozzle reconstitution and detailed rod examinations were performed on each assembly. The results of these activities are provided below.

### **Assembly G86**

The failed rod was removed from the assembly and visually examined with an underwater camera during removal. An open defect, about 1/2 inch in diameter, was found approximately 30 inches from the top of the rod. Several other defect locations on the rod were also evident. Due to the open nature of the defect, the rod was immediately transferred to the fuel rod storage basket (FRSB) and visually examined during placement into the FRSB. No high magnification visual exams were performed on this rod, due to concerns for potential further rod damage. However, a reasonably detailed inspection of the rod was performed in the FRSB. There was no evidence of failure due to either grid-to-rod fretting or debris. The end plug for the G86 failed rod was made from a lot of material that was susceptible to a fabrication related leakage mechanism. This mechanism is the most probable cause of the failure. Nevertheless, a failure mechanism has not been confirmed for G86. No further examination of the rod is currently planned.

### **Assembly G75**

Removal of the failed rod was initiated, however the rod separated during the process and only the bottom 60 inches of the rod was removed. The rod was visually examined with a camera during removal. At the separation location, an open defect approximately 3 inches in length was observed. No fuel pellets were evident at the defect location. The rod portion was transferred to the FRSB and visually examined during placement into the FRSB. The remaining part of the rod was left in the assembly and no further efforts were made to retrieve it. To prevent the potential loss of pellets during transfer to the FRSB, a catch basket was held below the rod during transfer. No fuel

escaped from the rod during this process and visual exams of the spent fuel pool and reactor cavity areas found no evidence of loose fuel fragments. No high magnification visual exams were performed on this rod, due to concerns for further rod degradation. However, the failed rod was examined in detail in the FRSB. There was no evidence of failure due to either grid-to-rod fretting or debris. The end plug for assembly G75 was made from the same material lot as G86. However, failure due to an end plug defect has not been confirmed. No further examination of the rod is currently planned.

Both G assemblies were discharged at the end of cycle 6. Coolant chemistry analysis at the beginning of cycle 6 indicated the presence of 1 - 2 tight defects. These defects were most likely missed during the UT exam immediately prior to cycle 6. The predicted burnup for the defects was consistent with that of the G assemblies. It is concluded that the two G assemblies entered cycle 6 with tight defects and the defects continually opened during cycle 6 operation.

#### Assembly H79

The 5 "suspect" rods were removed from the assembly and taken to a fuel rod inspection stand for high magnification visual examination. Analysis of the visual results at both Callaway and Westinghouse found no evidence of failure. Westinghouse is performing a review of the fabrication history of these rods to determine if any information concerning a potential leakage mechanism can be found. There is no evidence to date to suggest a failure mechanism, and indeed, these rods may not be leaking. Union Electric and Westinghouse continue to evaluate further inspections on both the suspect rods and assembly H79. Since no failures were found visually on the 5 rods, the status of the reconstituted H79 remains in question. Although H79 was planned for use in cycle 7, it was removed from use and remains in the spent fuel pool.