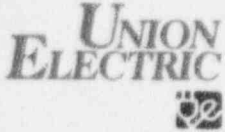


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August 2, 1996

Donald F. Schnell  
Senior Vice President  
Nuclear

U. S. Nuclear Regulatory Commission  
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Gentlemen:

ULNRC-03410  
TAC No. M95203


CALLAWAY PLANT  
DOCKET NUMBER 50-483  
REVISION TO TECHNICAL SPECIFICATION  
3/4.4 - REACTOR COOLANT SYSTEM

References: 1) ULNRC-3357 dated April 12, 1996  
2) K. M. Thomas ltr to D. F. Schnell  
dated July 23, 1996

This letter provides additional information in support of the Callaway Plant amendment application that proposes the installation of laser welded tube sleeves in the Callaway Plant steam generators. This information is submitted in response to the request for additional information transmitted by reference 2.

The significant hazards consideration determination, as previously transmitted in Attachment 4 of Reference 1, is still valid. If you have any questions concerning this information, please contact us.

Very truly yours,

  
for Donald F. Schnell

WEK/  
Attachment

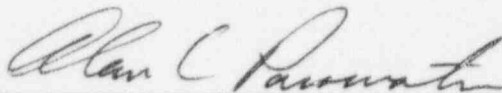
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STATE OF MISSOURI     )  
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COUNTY OF CALLAWAY    )

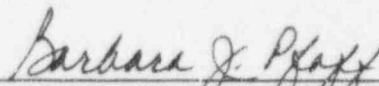
Alan C. Passwater, of lawful age, being first duly sworn upon oath says that he is Manager, Licensing and Fuels (Nuclear) for Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By



Alan C. Passwater  
Manager, Licensing and Fuels  
Nuclear

SUBSCRIBED and sworn to before me this second day  
of August, 1996.



BARBARA J. PFAFF  
NOTARY PUBLIC - STATE OF MISSOURI  
MY COMMISSION EXPIRES APRIL 22, 1997  
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RESPONSES TO NRC REQUEST FOR ADDITIONAL  
INFORMATION - CALLAWAY LASER WELDED SLEEVING

NRC Question 1

The Safety Evaluation (Attachment 3 of the technical specification (TS) change request) discussing steam generator sleeves mentions a generic set of design and transient loading inputs which are intended to bound all plants with Model F steam generators. However, there is no specific discussion or verification referenced that confirms these vendor supplied bounding values do in fact encompass the actual design/operating conditions at Callaway. Provide appropriate information regarding this issue.

Union Electric Response

The safety evaluations were performed using a generic set of design and transient loading inputs which are documented in Westinghouse System Standard 1.3F, Rev. 0, "Nuclear Steam Supply System - Reactor Coolant System Design Transients for Standard Plants with Model F Steam Generators", March 1978. These loading inputs were reviewed against the current Callaway plant design/operating conditions which have not changed since start of operation, and confirmed to envelop the Callaway conditions.

NRC Question 2

Three confirmatory tests (welding of 11/16 inch tube sleeves, leak rate, and structural capability) are outstanding. Please provide results, if available, or schedule for completion.

Union Electric Response

Confirmatory laser welding sleeved tube joints have been made to establish welding parameters and the welds have been found to meet all applicable requirements. Formal weld process qualification (including preparation of the Weld Process Specification) is currently being completed and a summary of the results will be provided by August 15, 1996.

Confirmatory leak rate and structural (pullout) testing of the sleeve lower hard rolled joint and qualification have been completed. The hard rolling torque has been established

at  $120 \pm 10$  in. lb. which is well within the capability of the tooling. The average leak rate measured was about 0.02 drops per minute (dpm) compared to the target value of 0.5 dpm (40 percent of allowable per tube leak rate). The pullout forces (to determine structural capability) were in the range of 2700 to 2750 lb. providing a margin of well over 1000 lbs. compared to three times the maximum end cap loads during normal operation.

### NRC Question 3

Do previous Westinghouse tests of the magnitude of bowing/bulging bound the case for the smaller diameter tubes at Callaway? Is tube-to-tube contact possible? If so, discuss implications.

### Union Electric Response

Previous laboratory testing in support of Maine Yankee laser welded sleeving under locked tube conditions and using 1/2 inch, 20 inch, and 30 inch long elevated tubesheet sleeves had shown that unacceptable bowing of the tube could occur only with the 30 inch long sleeve. This was because for a 30-inch elevated tubesheet sleeve the weld joint was approximately at mid-span between the first tube support plate and the top of the tubesheet. As only 12 inch long elevated tubesheet sleeves are planned to be installed at Callaway, there is no possibility of unacceptable tubing bowing or potential for adjacent tubes to touch one another. The test rig geometry used for Maine Yankee envelops the Callaway tube support span.

Bulging of the sleeved tube at the weld region due to welding and post-weld heat treatment is about the same as for 7/8 inch and 3/4 inch laser welded sleeves (less than 0.008") and has no adverse structural, corrosion performance, or EC inspection impacts as demonstrated in support of Maine Yankee sleeving.

### NRC Question 4

The staff notes that only elevated tubesheet sleeves are included in the amendment request. Is there a sludge pile on top of the tubesheet at Callaway? If so, is the depth such that the sleeve length discussed in the TS amendment sufficient to place the weld and PWHT zone above the top of

the sludge pile? If a longer sleeve was desirable, would it create other installation difficulties?

Union Electric Response

Only 12 inch long elevated tubesheet sleeves are planned to be installed at Callaway. The Callaway steam generators have been regularly sludge lanced prior to 1995. In 1995 a pressure pulse-chemical cleaning campaign was implemented to address tube fouling and loss of power. There is therefore very little sludge present on the top of the tubesheet. The utility plans to sludge lance regularly in the future as needed to limit sludge pile buildup. The 12 inch long elevated tubesheet sleeve installation will have the weld located approximately 4.38" above the top of the tubesheet and well above any anticipated sludge accumulation in service (expected to be less than 1").

NRC Question 5

Please provide the Union Electric position regarding ISE NDE of steam generator tubes. What is the currently employed probe type? What program exists for evaluating and incorporating new probe designs?

Union Electric Response

Steam Generator inspection plans for Refuel 8 call for bobbin coil inspection of 100% of 2 steam generators and rotating pancake coil inspection, using the plus point probe, of 100% of the hot leg tube sheet transitions in all 4 steam generators.

The baseline inspection of the sleeved tubes will be performed with a magnetically biased CECCO-5 probe with an integral bobbin coil. This probe has been qualified for both sleeved tube and general tube inspection to the EPRI Appendix H guidelines. In addition, the baseline inspection will also be performed with the Plus Point probe.

Union Electric continues to monitor and evaluate steam generator industry inspection techniques. We will continue to utilize appropriate techniques qualified to Appendix H of the EPRI PWR Steam Generator Examination Guidelines for use at Callaway Plant.