

September 24, 1996

Donald F. Schnell
Senior Vice President
Nuclear

U. S. Nuclear Regulatory Commission
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Gentlemen:

ULNRC-3451
TAC No. M95204

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

References: 1) ULNRC-3358 dated April 12, 1996
2) K. M. Thomas ltr to D. F. Schnell
dated July 25, 1996

This letter provides additional information in support of the Callaway Plant amendment application that proposes the installation of electrosleeves 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.

Framatome Technologies Inc. has determined that information associated with the installation process for electrosleeves is proprietary, and is thereby supported by an affidavit signed by Framatome, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10CFR2.790. Accordingly, it is respectfully requested that the information which is proprietary to Framatome be withheld from public disclosure in accordance with 10CFR2.790.

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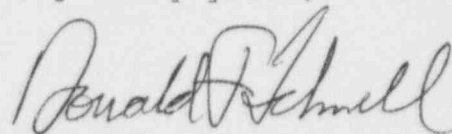
LTR End.

1 INP

V/I
APOI

If you have any questions concerning this information, please contact us.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Donald F. Schnell".

Donald F. Schnell

WEK/

Attachments: 1) Proprietary Information Affidavit
2) Response to Request for Additional
Information (Proprietary)
3) Response to Request for Additional
Information (Non-Proprietary)

STATE OF MISSOURI)
) S S
CITY OF ST. LOUIS)

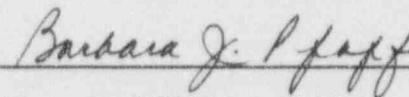
Donald F. Schnell, of lawful age, being first duly sworn upon oath says that he is Senior Vice President-Nuclear and an officer of Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power 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



Donald F. Schnell
Senior Vice President
Nuclear

SUBSCRIBED and sworn to before me this 24th day
of September, 1996.



BARBARA J. PFAFF
NOTARY PUBLIC — STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 22, 1997
ST. LOUIS COUNTY

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AFFIDAVIT OF JAMES H. TAYLOR

- A. My name is James H. Taylor. I am Manager of Licensing Services for Framatome Technologies, Inc. (FTI), and as such, I am authorized to execute this Affidavit.
- B. I am familiar with the criteria applied by FTI to determine whether certain information of FTI is proprietary and I am familiar with the procedures established within FTI to ensure the proper application of these criteria.
- C. In determining whether an FTI document is to be classified as proprietary information, an initial determination is made by the Unit Manager, who is responsible for originating the document, as to whether it falls within the criteria set forth in Paragraph D hereof. If the information falls within any one of these criteria, it is classified as proprietary by the originating Unit Manager. This initial determination is reviewed by the cognizant Section Manager. If the document is designated as proprietary, it is reviewed again by Licensing personnel and other management within FTI as designated by the Manager of Licensing Services to assure that the regulatory requirements of 10 CFR Section 2.790 are met.
- D. The following information is provided to demonstrate that the provisions of 10 CFR Section 2.790 of the Commission's regulations have been considered:
- (i) The information has been held in confidence by FTI. Copies of the document are clearly identified as proprietary. In addition, whenever FTI transmits the information to a customer, customer's agent, potential customer or regulatory agency, the transmittal requests the recipient to hold the information as proprietary. Also, in order to strictly limit any potential or actual customer's use of proprietary information, the substance of the following provision is included in all agreements entered into by FTI, and an equivalent version of the proprietary provision is included in all of FTI's proposals:

AFFIDAVIT OF JAMES H. TAYLOR (Cont'd.)

"Any proprietary information concerning Company's or its Supplier's products or manufacturing processes which is so designated by Company or its Suppliers and disclosed to Purchaser incident to the performance of such contract shall remain the property of Company or its Suppliers and is disclosed in confidence, and Purchaser shall not publish or otherwise disclose it to others without the written approval of Company, and no rights, implied or otherwise, are granted to produce or have produced any products or to practice or cause to be practiced any manufacturing processes covered thereby.

Notwithstanding the above, Purchaser may provide the NRC or any other regulatory agency with any such proprietary information as the NRC or such other agency may require; provided, however, that Purchaser shall first give Company written notice of such proposed disclosure and Company shall have the right to amend such proprietary information so as to make it non-proprietary. In the event that Company cannot amend such proprietary information, Purchaser shall prior to disclosing such information, use its best efforts to obtain a commitment from NRC or such other agency to have such information withheld from public inspection.

Company shall be given the right to participate in pursuit of such confidential treatment."

AFFIDAVIT OF JAMES H. TAYLOR (Cont'd.)

- (ii) The following criteria are customarily applied by FTI in a rational decision process to determine whether the information should be classified as proprietary. Information may be classified as proprietary if one or more of the following criteria are met:
- a. Information reveals cost or price information, commercial strategies, production capabilities, or budget levels of FTI, its customers or suppliers.
 - b. The information reveals data or material concerning FTI research or development plans or programs of present or potential competitive advantage to FTI.
 - c. The use of the information by a competitor would decrease his expenditures, in time or resources, in designing, producing or marketing a similar product.
 - d. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a competitive advantage to FTI.
 - e. The information reveals special aspects of a process, method, component or the like, the exclusive use of which results in a competitive advantage to FTI.
 - f. The information contains ideas for which patent protection may be sought.

AFFIDAVIT OF JAMES H. TAYLOR (Cont'd.)

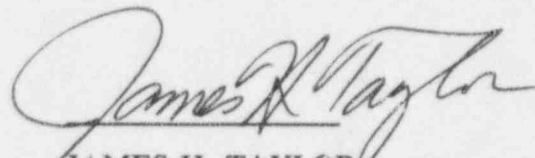
The document(s) listed on Exhibit "A", which is attached hereto and made a part hereof, has been evaluated in accordance with normal FTI procedures with respect to classification and has been found to contain information which falls within one or more of the criteria enumerated above. Exhibit "B", which is attached hereto and made a part hereof, specifically identifies the criteria applicable to the document(s) listed in Exhibit "A".

- (iii) The document(s) listed in Exhibit "A", which has been made available to the United States Nuclear Regulatory Commission was made available in confidence with a request that the document(s) and the information contained therein be withheld from public disclosure.
- (iv) The information is not available in the open literature and to the best of our knowledge is not known by Combustion Engineering, EXXON, General Electric, Westinghouse or other current or potential domestic or foreign competitors of FTI.
- (v) Specific information with regard to whether public disclosure of the information is likely to cause harm to the competitive position of FTI, taking into account the value of the information to FTI; the amount of effort or money expended by FTI developing the information; and the ease or difficulty with which the information could be properly duplicated by others is given in Exhibit "B".

E. I have personally reviewed the document(s) listed on Exhibit "A" and have found that it is considered proprietary by FTI because it contains information which falls within one or more of the criteria enumerated in Paragraph D, and it is information which is customarily held in confidence and protected as proprietary information by FTI. This report comprises information

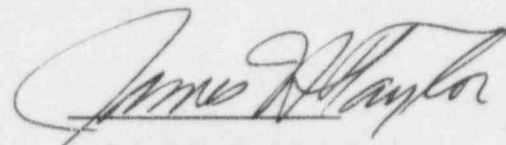
AFFIDAVIT OF JAMES H. TAYLOR (Cont'd.)

utilized by FTI in its business which afford FTI an opportunity to obtain a competitive advantage over those who may wish to know or use the information contained in the document(s).

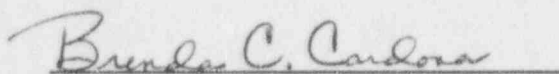

JAMES H. TAYLOR

State of Virginia)) SS. Lynchburg
City of Lynchburg)

James H. Taylor, being duly sworn, on his oath deposes and says that he is the person who subscribed his name to the foregoing statement, and that the matters and facts set forth in the statement are true.


JAMES H. TAYLOR

Subscribed and sworn before me
this 20th day of September 1996.


Notary Public in and for the City
of Lynchburg, State of Virginia.

My Commission Expires July 31, 1999

EXHIBITS A & B

EXHIBIT A

"Proprietary" Responses to Request for Additional Information (RAI) Regarding Union Electric Company's Request for Amendment to the Technical Specifications for Callaway Plant, Unit 1. This information was transmitted in J. H. Taylor's letter (JHT/96-59) to Ms. Kristine M. Thomas (NRC), dated September 12, 1996.

EXHIBIT B

The above listed document contains information which is considered Proprietary in accordance with Criteria b, c, d, and e of the attached affidavit.

REQUEST FOR ADDITIONAL INFORMATION
UNION ELECTRIC COMPANY
CALLAWAY PLANT, UNIT 1
DOCKET NO. 50-483

<u>Subject</u>		<u>Pages</u>
Questions/Answers	10
Attachment 1	2
Attachment 2	3
Attachment 3	7

REQUEST FOR ADDITIONAL INFORMATION
UNION ELECTRIC COMPANY
CALLAWAY PLANT, UNIT 1
DOCKET NO. 50-483

The following information relating to the proposed Framatome electrosleeving process for repairing steam generator tubes at the Callaway plant is needed. Answers provided to Questions 1 through 4 should address both ultrasonic and eddy current inspection methods.

- Q1. Framatome presented only limited information on the inspection of Electrosleeves™ for the detection of laboratory-induced stress corrosion cracking (SCC) in the parent tube. Discuss the detection threshold for SCC tube flaws (axial and circumferential) in electrosleeved tubes using the actual field data analysis procedures for degradation located at expansion transitions and dented tube support plate intersections. Also include a discussion of the potential masking of the outside-diameter parent tube defects caused by asymmetric variations in the sleeve thickness at the exit and entrance regions.
- A1. UT inspection of the nickel and alloy 600 depends on the transmission and reflection of a sound wave through the combined layer.

FTI has used the Electrosleeve™ UT system to perform field examination of steam generator tubes associated with subsequent tube pulls. Data has been collected on tubes, including both TSP/freespan regions and Top of Tubesheet (TTS) roll expansion transitions.

Table 1 presents the results of the comparison.

Qualification of an ECT technique for inspecting an Electrosleeve™

The qualification include both EDM notches and laboratory-induced SCC.

- Q2. Since the electrosleeving process enables detection of parent tube flaws beneath the sleeve, define and provide the basis for a plugging criteria for tubes with a measurable change (from the initial inspections) in NDE signal response for indications located below the Electrosleeve™. If these criteria rely on the ability to depth size indications, provide a detailed description of the qualification process to assess these depths. Include a description of the flaws (i.e., SCC versus EDM notches, orientation, depths, number of samples, etc.) used to qualify the method. Also discuss the potential influence on flaw depth measurement due to variations in sleeve wall thickness.
- A2. As discussed in response to Question 1, FTI has applied the Electrosleeve™ UT system in the field to examine tube pull candidates.

The pulled tubes discussed above did not have Electrosleeves™ installed at the defect locations. FTI is of documenting UT-360 crack sizing of stress corrosion cracks under an installed Electrosleeve™.

discusses the UT qualification program performed on electrosleeved tubes with EDM notches and flat bottom holes.

The qualification program of an ECT technique

- Q3. Eddy current inspection methods may be more sensitive than ultrasonic techniques for the detection of pits and nodules introduced in the fabrication process. Discuss the need to use diverse inspection methods for accepting Electrosleeves™ following the installation process.
- A3. The ASME Boiler and Pressure Vessel Code Case N-569 (Reference 3) defines the general requirements for electrochemical deposition repair of steam generator tubes. This Code Case states that NDE acceptance of the repair shall be performed on the entire volume of the deposit with the ultrasonic method. This is in agreement with

Installation acceptance (bonding, verification of thickness, and evaluation of defects or inclusions) requires the use of UT examination. UT is also planned for future inspections. However, ECT will also be performed at installation to provide a baseline for future inspections.

- Q4. At what tolerance level can the sleeve thickness be measured using the proposed field data analysis procedures?
- A4. The field UT data analysis equipment and procedures can measure sleeve thickness to an accuracy of is not intended to measure sleeve thickness.
- Q5. During the presentations on July 2, 1996, NDE data was presented that suggested that inservice operation of electrosleeves can expand unbonded areas between the sleeve and tube. Define the acceptance criteria, if any, for electrosleeved tubes with identified unbonded regions addressing the potential for these areas to expand over the next operational cycle.

- A5. The information presented on July 2, 1996 relative to "inservice operation" was based on the Electrosleeve™ installation at Pickering in April-May 1994. Attachment 4, pages 10 through 13 of Reference 2 discussed this evaluation. The surface of the alloy 400 tubes at Pickering were cleaned using

The alloy 600 tubing is cleaned
followed by

to remove oxides
step to remove any remaining oxides

The alloy 600 cleaning

process was qualified

Acceptance of an installed Electrosleeve™ with an unbonded area depends on review of the complete installation. The minimum bond length required on the ends of the sleeve which span a defect area is defined in Reference 1. The ASME Section XI Code Case (Reference 3) which considers initial installation inspection requirements defined the acceptance criteria as any disbond length greater than 0.250 inch is unacceptable.

- Q6. The electrosleeving process requires a clean tube surface prior to electrochemical deposition of the sleeve. For tubes with geometry changes in the vicinity of the parent tube defect, this will largely depend on the ability to remove all tube deposits during the cleaning/activation step. Discuss the ability of the cleaning/activation step to remove tube deposits. If previous testing has been conducted to assess this issue, discuss the similarity between the deposits on inservice steam generator tubes and those used in the tests.
- A6. As stated in the response to question 5, the cleaning process for alloy 600 tubing to remove oxides followed by step to remove any remaining oxides of alloy 600 material. This step is very aggressive due to the

the alloy 600. The step is not sensitive to the tube ID contours because an electrochemical cell containing a fluid at temperature and pressure is established by the probe to clean the tube.

- Q7. Has Framatome contacted a third-party reviewer (not a customer) to examine the overall plating process? If so, provide a summary of the review scope and the findings.
- A7. Framatome has not directly contacted a third-party reviewer to examine the overall plating process. independent reviews have been performed; an ASME working group there is substantial relevant experience with acceptance of nickel plating in Europe.

ASME SECTION XI. An ASME Code Case for repair of steam generator tubes by electrochemical deposition was submitted to the ASME Section XI for review and approval. As a result of this request, an ASME working task force was assembled and performed several reviews which included a technical review of the actual equipment used to perform the process. The working group consisted of 12 members with diverse technical backgrounds. The results of this review found the process to be acceptable. The ASME Code Case was subsequently approved [3].

RELEVANT EXPERIENCE. As discussed nickel plating of defective steam generator tubes has been performed successfully by Framatome for over 10 years in Europe.

experience are referenced papers documenting testing and

Q8. During any plating process, bonding is dependent on two basic things: (1) cleanliness of the parent surface material, and (2) minimal resistance to current path. How does Framatome propose to ensure that these two items are within a high certainty of optimum cleanliness and current flow? What is the range of acceptable parameter variations?

A8.

Bonding is verified with UT after each Electrosleeve™ installation.

- Q9. Since the sleeve is a deposit of Ni rather than a forged material, what does Framatome propose to do about qualifying this material as a reactor coolant boundary from the QA/QC perspective? It has been staff experience that commercial sources of expendables for use in safety-related applications are often problematic - i.e., purchases of greases, oils, powders, resins, boron, lithium, and zinc (for zinc injection). Describe the actions taken to assure an effective commercial dedication program for materials to be obtained from commercial suppliers. How has Framatome addressed this issue with respect to the consumables important to the plating process? What protocol is in place to ensure acceptability?
- A9. FTI has an Electrosleeving Chemical Procurement procedure that specifies the steps to be taken for the procurement and the inventory control of chemicals to be used in this process. This procedure references the Electrosleeving Chemical Procurement Specifications document that lists the content requirements for each chemical.

The documentation for the chemicals used are provided to the customer in the form of a data package to support transportation, receipt, and control at a plant site.

Q10. In conjunction with the preceding question, what chemical or elemental species has Framatome identified that are particularly deleterious to a successful cleaning/plating job? What acceptable concentration levels for such containments been established? Describe programs such as receipt inspection for conformance that have been established.

A10. The response to question 9 provides information on receipt and inspection programs.

Q11. Describe any engineering evaluations and independent confirmatory tests regarding electrosleeving that were performed by Union Electric prior to submittal of the license amendment. Describe any ongoing engineering evaluations.

- A11. Union Electric was represented when FTI presented an overview of the topical and the methodology used in the structural testing. Additional evaluation was performed in conjunction with the evaluation and preparation of the ASME Section XI code case. The Safety Evaluation and Significant Hazards Evaluation were prepared by Union Electric and reviewed for technical input relative to the Electrosleeve™ repair option. Relative to "independent confirmatory tests by Union Electric", none were conducted.

Attachments:

1. Table 1. SCC Depth Sizing
2. Table 2. EDM Notch Depth
- 3.

References:

1. Topical Report BAW-10219P, Rev 1, "Electrosleeving Qualification for PWR Recirculating Steam Generator Tube Repair", March 1996.
2. "Proprietary" Presentation Material from July 2, 1996 Meeting in Lynchburg Va on Electrosleeving, as defined in Union Electric Company, Technical Specification Amendment, Docket 50-483, NRC Meeting Notice dated June 17, 1996.
3. ASME Section XI, Division 1, Code Case N-569, Alternative Rules for Repair by Electrochemical Deposition of Class 1 and 2 Steam Generator Tubing.

Attachment 1

Table 1. SCC Depth Sizing
(2 Pages)

[illegible]

Attachment 1

Table 1. SCC Depth Sizing
(2 Pages)

LABEL	Defect Type	PERCENT THROUGH WALL (% TW)		
		ACTUAL	UT-360	DELTA

Notes: 1.
2.

Table 2. EDM Notch Depth Sizing
(3 Pages)

[illegible]

Table 2. EDM Notch Depth Sizing
(3 Pages)

[illegible]

**Table 2. EDM Notch Depth Sizing
(3 Pages)**

Note: 1.

2.

Attachment 3

Attachment 3.

