



SOUTHERN CALIFORNIA  
**EDISON**<sup>®</sup>

An EDISON INTERNATIONAL<sup>®</sup> Company

Brian Katz  
Vice President

November 3, 2005

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

**Subject: San Onofre Nuclear Generating Station, Units 2 and 3  
Docket Nos. 50-361 and 50-362  
Proposed Change Number NPF-10/15-565  
License Amendment Request, "Proposed Technical Specification  
Change, Define the Extent of the Required Tube Inspections and  
Repair Criteria Within the Tubesheet Region of the Steam  
Generators"**

- References: 1. Letter from A. E. Scherer (SCE) to Document Control Desk (NRC) Dated October 26, 2004; Subject: Docket Nos. 50-361 and 50-362, NRC Generic Letter 2004-01 Requirements for Steam Generator Tube Inspections, San Onofre Nuclear Generating Station, Units 2 and 3
2. Letter from D. Mauldin (Arizona Public Service Company) to Document Control Desk (NRC) Dated May 26, 2005, Subject: Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3, Docket Nos. STN 50-528, 50-529, and 50-530, Application for Technical Specification Improvement Regarding Steam Generator Tube Integrity and Steam Generator Tube Inspection Length through the Tubesheet (This is NRC ADAMS Accession Number ML051520413)

Dear Sir or Madam:

Pursuant to 10CFR50.90, Southern California Edison (SCE) is submitting Enclosure 3 "Proposed Change Number (PCN)-565" to request an amendment to SCE Licenses NPF-10 and NPF-15 to change Technical Specifications for San Onofre Units 2 and 3. The proposed amendment revises Technical Specification (TS) Section 5.5.2.11 to modify the definitions of steam generator tube "Repair Limit" and "Tube Inspection." The purpose of these changes is to define the extent of the required tube inspections and repair criteria within the tubesheet regions.

In Reference (1) SCE committed to submit a license change in accordance with Nuclear Regulatory Commission Generic Letter 2004-01 to revise the inspection definition from the current wording to a value consistent with SCE's technical basis. Reference (1) specifically addressed inspection within the hot leg (inlet) tubesheet. Subsequent

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industry experience at other nuclear power plants with Primary Water Stress Corrosion Cracking (PWSCC) at tubing within cold leg (outlet) tubesheet locations has influenced SCE to also address inspection within these locations in this License Amendment Request. SCE's technical bases addressing tube structural and leakage integrity are Reference (2), Westinghouse Owners Group (WOG) topical report WCAP-16208-P, Revision 1, dated May 2005, titled "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions," and Enclosures (5) and (6) WCAP-16208-P, Revision 1, Supplement 1 and WCAP-16208-PN (Non Proprietary), Revision 1, Supplement 1, both dated July 2005, and titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions."

WCAP16208-P, Revision 1 was previously submitted to the NRC by Arizona Public Service Company for Palo Verde Nuclear Generating Station (Reference (2)). Therefore, this report is not being resubmitted to the NRC as part of this San Onofre Units 2 and 3 license amendment request.

Enclosure (5) is a copy of WOG topical report WCAP-16208-P, Revision 1, Supplement 1, dated July 2005, titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions." This site-specific supplement to the WCAP has not been previously submitted to the NRC.

Enclosure (6) is a nonproprietary copy of WOG topical report WCAP-16208-NP, Revision 1, Supplement 1, dated July 2005, titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions."

SCE has determined that there are no significant hazards considerations associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22 (c) (9).

As Enclosure (5) contains information proprietary to Westinghouse Electric Company, LLC, it is supported by Enclosure (4), an affidavit signed by Westinghouse, 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 Section 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 of the Commission's regulations. Correspondence with respect to the copyright or proprietary aspects of the Enclosure (5) or the supporting Westinghouse affidavit should reference CAW-05-2042 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

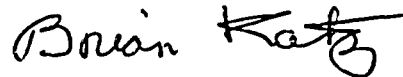
The requested Unit 2 and 3 Technical Specification changes are included with this amendment request as Attachments to Enclosure (3).

As previously discussed in Reference (1), NRC approval of this proposed TS is not necessary for start up or for continued operation. SCE requests NRC approval of this change by June 1, 2006. SCE requests that these amendments be implemented within 60 days from the date of issuance.

SCE is making no new commitments that would result from NRC approval of the proposed amendments.

Should you have any questions, or require additional information, please contact Mr. Jack Rainsberry at (949) 368-7420.

Sincerely,



Enclosures

1. Notarized affidavit, Unit 2
2. Notarized affidavit, Unit 3
3. Proposed Change Number (PCN)-565
4. Westinghouse Application for Withholding Proprietary Information from Public Disclosure with Affidavit
5. WCAP-16208-P, Revision 1, Supplement 1, dated July 2005, titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions"
6. WCAP-16208-NP, Revision 1, Supplement 1, dated July 2005, titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions"

cc: B. S. Mallett, Regional Administrator, NRC Region IV  
J. N. Donohew, NRC Project Manager, San Onofre Units 2 and 3  
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 and 3  
S. Y. Hsu, Department of Health Services, Radiological Health Branch

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA	)	
EDISON COMPANY, <u>ET AL.</u> for a Class 103	)	Docket No. 50-361
License to Acquire, Possess, and Use	)	
a Utilization Facility as Part of	)	Amendment Application
Unit No. 2 of the San Onofre Nuclear	)	No. 238
Generating Station)		

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 238. This amendment application consists of Proposed Change No. NPF-10-565 to Facility Operating License NPF-10. Proposed Change No. NPF-10-565 is a request to revise Facility Operating License NPF-10 to define the extent of the required tube inspections and repair criteria within the tubesheet regions.

State of California  
County of San Diego

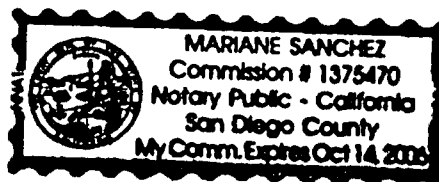
Brian Katz  
Brian Katz, Vice President

Subscribed and sworn to (or affirmed) before me on this 3rd day of  
November 2005.

by Brian Katz.

personally known to me or ~~proved to me on the basis of satisfactory evidence~~ to be the person who appeared before me.

Mariane Sanchez  
Notary Public



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA	)	
EDISON COMPANY, <u>ET AL.</u> for a Class 103	)	Docket No. 50-362
License to Acquire, Possess, and Use	)	
a Utilization Facility as Part of	)	Amendment Application
Unit No. 3 of the San Onofre Nuclear	)	No. 222
Generating Station)		

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 222. This amendment application consists of Proposed Change No. NPF-15-565 to Facility Operating License NPF-15. Proposed Change No. NPF-15-565 is a request to revise Facility Operating License NPF-15 to define the extent of the required tube inspections and repair criteria within the tubesheet regions.

State of California  
County of San Diego

Brian Katz  
Brian Katz, Vice President

Subscribed and sworn to (or affirmed) before me on this 3rd day of  
November 2005.

by Brian Katz.

~~personally known to me or proved to me on the basis of satisfactory evidence to be the~~  
person who appeared before me.

Mariane Sanchez  
Notary Public



**ENCLOSURE 3**

**Description and No Significant Hazards Analysis  
for Proposed Change NPF-10/15-565  
San Onofre Nuclear Generating Station  
Units 2 and 3**

## **LICENSEE'S EVALUATION**

### **DESCRIPTION AND NO SIGNIFICANT HAZARDS ANALYSIS FOR PROPOSED CHANGE NPF-10/15-565 PROPOSED TECHNICAL SPECIFICATION CHANGE, DEFINE THE EXTENT OF THE REQUIRED TUBE INSPECTIONS AND REPAIR CRITERIA WITHIN THE TUBESHEET REGION OF THE STEAM GENERATORS San Onofre Nuclear Generating Station Units 2 and 3**

#### **EXISTING TECHNICAL SPECIFICATIONS**

Unit 2: see Attachment A  
Unit 3: see Attachment B

#### **PROPOSED TECHNICAL SPECIFICATIONS (highlight for additions, strikeout for deletions)**

Unit 2: see Attachment C  
Unit 3: see Attachment D

#### **PROPOSED TECHNICAL SPECIFICATIONS (with changes)**

Unit 2: see Attachment E  
Unit 3: see Attachment F

### **1.0 INTRODUCTION**

A change is proposed to revise the San Onofre Units 2 and 3 Technical Specifications (TS) Section 5.5.2.11 to modify the definitions of steam generator tube "Repair Limit" and "Tube Inspection." The purpose of these changes is to define the extent of the required tube inspections and repair criteria within the tubesheet regions.

### **2.0 PROPOSED CHANGE**

SCE proposes a revision to TS 5.5.2.11 for the San Onofre Units 2 and 3 Technical Specifications. Specifically, the current steam generator tube surveillance program acceptance criteria definitions for "Repair Limit" (item 5.5.2.11.f.1.f), "Tube Inspection" (item 5.5.2.11.f.1.h), and item 5.5.2.11.f.2 read as follows:

**5.5.2.11.f.1.f)**      *"Repair Limit – The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness; Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld."*

- 5.5.2.11.f.1.h) *“Tube Inspection – An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg excluding the portion of the tube within the tubesheet (TS) below 5 inches from the secondary face of the TS.\*  
\*This exclusion is for Unit 2, Cycle 12 operation only.  
\*This exclusion is for Unit 3, Cycle 11 operation only.”*

NOTE to NRC reviewers of this change:

The above exclusion was incorporated in June 2002 by Unit 2 and 3 NRC amendments 189 and 180 and has expired, since both units are currently in Cycle 13 operation.

- 5.5.2.11.f.2. *“The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks, and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.”*

It is proposed that these acceptance criteria definitions be revised to read as follows:

- 5.5.2.11.f.1.f) *“Repair Limit – The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness. Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.*

*For tubes that have not been repaired (sleeved): Degradation detected below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection. Degradation detected below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection.*

*This Repair Limit is not applicable in the portion of the tubing within the hot leg tubesheet as follows:*

*For tubes that have not been repaired: Greater than 10.4 inches below the bottom of the hot leg expansion transition or top of the hot leg tubesheet, whichever is lower.*

*For tubes that have been repaired: Below the bottom of the pressure retaining portion of the parent tube in contact with the sleeve (the lower joint that is formed by hard-rolling) or greater than*



*10.4 inches below the bottom of the hot leg expansion transition, whichever is lower.”*

5.5.2.11.f.1.h) *“Tube Inspection – An inspection of the SG tube from 10.4 inches below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is lower, completely around the U-bend to 10.7 inches below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is lower.”*

5.5.2.11.f.2 *“The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks in applicable portions of the tube as described in the definition of “Repair Limit,” and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.”*

#### NOTES to NRC Reviewers of this Change:

NOTE 1: Regarding the above tube inspection definition change: It was extended below the top support on the cold leg side, so that tubing within the cold leg tubesheet tubing could be addressed in this proposed change. Addressing tubing below the top support on the cold leg side reflects San Onofre practice and is consistent with the most recent industry and NRC guidance (Reference 7.1).

NOTE 2: The added words in the “Operability determination” item (5.5.2.11.f.2) provide consistency with the change in the definition of “Repair Limit.”

### 3.0 BACKGROUND

In May 2002 the NRC staff expressed interest in rotating eddy current probe inspections being done in response to Primary Water Stress Corrosion Cracking (PWSCC) within the hot leg tubesheet. After SCE and NRC interface on this matter, Technical Specifications were changed for San Onofre Units 2 and 3, for the existing cycle of operation to re-define “tube inspection” as *“excluding the portion of the tube within the tubesheet (TS) below 5 inches from the secondary face of the TS”*. This exclusion expired at the end of that operating cycle at each unit, pending resolution by the NRC staff on a generic basis. The associated Westinghouse Owners Group technical basis continued to evolve, and SCE inspection practices followed similarly.

On August 30, 2004, the NRC issued Generic Letter (GL) 2004-01, Requirements for Steam Generator Tube Inspections. The GL requested Pressurized Water Reactor licensees to submit information concerning their steam generator tube inspections. The requested information would be utilized by the NRC staff to determine whether licensees are implementing steam generator tube inspections in accordance with applicable requirements (plant TS in conjunction with 10 CFR Part 50, Appendix B, and

the General Design Criteria or the plant specific design basis, as appropriate). SCE submitted the response to GL 2004-01 for San Onofre Units 2 and 3 on October 6, 2004 (Reference 7.2).

In Reference 7.2 SCE committed to submit a license change request in accordance with Nuclear Regulatory Commission Generic Letter 2004-01 to clarify the inspection definition from the current wording to a value consistent with SCE's technical basis. Reference 7.2 specifically addressed inspection within the hot leg (inlet) tubesheet.

In November 2004 Florida Power and Light (FP&L) submitted a license amendment request for St. Lucie Unit 2, with Westinghouse Owners Group (WOG) WCAP-16208-P Revision 0, dated October 2004, titled NDE "Inspection Length for CE Steam Generators Tubesheet Regions Explosive Expansions," as part of the technical basis. The NRC and FP&L exchanged requests for information and responses regarding WCAP-16208-P Revision 0. The Westinghouse Owners Group subsequently captured this information exchange in WCAP-16208-P Revision 1, dated May 2005. In May 2005, Arizona Public Service Company (APS) submitted a license amendment request for Palo Verde Units 1, 2, and 3 with WCAP-16208-P Revision 1 as part of the technical basis. San Onofre Units 2 and 3 inspection practices conservatively exceeded the WCAP-16208-P Revision 1 criterion.

SCE has monitored reports from other licensees over the last several months of unanticipated detection of PWSCC in tubing within or near cold leg (outlet) tubesheet locations. This has influenced SCE to obtain additional technical basis documentation specific to tubing within the cold leg tubesheet, and address it within this License Amendment Request.

While addressing tubing within the cold leg tubesheet, SCE has elected to enhance clarity by including the balance of the cold leg tubing in the TS definition of "Tube Inspection." In the current TS wording, the portion of the tube below the top support on the cold leg is excluded. SCE practice has been to inspect this region of the tube and this is consistent with the most recent industry and NRC guidance (Reference 7.1).

SCE's technical basis addressing tube structural and leakage integrity has evolved to Westinghouse Owners Group (WOG) topical reports WCAP-16208-P, Revision 1, dated May 2005, titled "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions," and WCAP-16208-P, Revision 1, Supplement 1, dated July 2005, titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions."

#### **4.0 TECHNICAL ANALYSIS**

**Design** – The San Onofre Unit 2 and 3 steam generators are designed and supplied by Combustion Engineering (CE). Each unit has two steam generators. Each San Onofre steam generator contains 9350 tubes. The tubing in San Onofre steam generators is made from Inconel 600 and mill annealed at a high temperature (HTMA). The tubes

have an outer diameter of 0.750 inches and a nominal wall thickness of 0.048 inches. Rows 1 through 18 are U-bend type tubes. In all other rows, the upper portion consists of two 90-degree bends with a horizontal span (square bends).

The tubes are explosively expanded ("Expanded") the full depth of the 23 inch tubesheet. The resultant interference fit between each of the tubes and tubesheet provides structural integrity to resist tube pull-out, and a leak resistant boundary between the primary and secondary systems. Previous testing performed for SCE by Westinghouse has determined the location of the "bottom of the expansion transition" relative to the top of the tubesheet. This location of the "bottom of the expansion transition" directly affects the tube engagement length with the tubesheet and is taken into account when the depth of inspections is established for the tubesheet region. A weld joins the tube end to the cladding on the primary face of the tubesheet.

**Inspection Practices/Results** - The San Onofre Steam Generator Program requires that a degradation assessment be performed prior to planned steam generator inspections. The purpose of the degradation assessment is to determine susceptible areas of the tubing to be inspected, and the appropriate techniques for inspection of each area. Data gathered is utilized as input to the subsequent condition monitoring and operational assessments. The San Onofre Steam Generator Program satisfies Nuclear Energy Institute (NEI) 97-06, Steam Generator Program Guidelines (Reference 7.4).

San Onofre Units 2 and 3 have experienced both axially and circumferentially oriented PWSCC in tubing within the hot leg tubesheet. They have not experienced corresponding PWSCC in tubing within the cold leg tubesheet. The most recent inspection practices and results have been provided to the NRC in References 7.5, 7.6, 7.7, and 7.8.

**Analysis** – An Owners Group industry test program (documented in Westinghouse WCAP-16208-P, Revision 1, with Supplement 1), determined a recommended inspection length (C\*) in the tubesheet region of CE design steam generators that would ensure the structural integrity and accident-induced leakage criteria of NEI-97-06 are met. Specifically, the tube to tubesheet joints must resist burst with an internal pressure of 3 x Normal Operating Differential Pressure (NODP) or 1.4 x Main Steam Line Break (MSLB) differential pressure conditions. Also, the joints must maintain primary to secondary accident-induced leakage below 0.5 gallon per minute (gpm) per steam generator (WCAP-16208-P clarifies that a value of 0.5 gpm is more typically applicable to CE design steam generators than the 1.0 gpm value in NEI 97-06). More specifically, the recommended inspection length C\* in WCAP-16208-P Revision 1, with Supplement 1, was designed to maintain primary to secondary accident-induced leakage below 0.2 gpm per steam generator for typical tubing degradation within the hot and cold leg tubesheets. It should be noted that C\* is intended to define the minimum tube engagement length within the tubesheet. As such, this distance is referenced from the bottom of the expansion transition, or top of the tubesheet, whichever is lower.

Tube burst is precluded for a tube with defects in the tubesheet region because of the constraint provided by the tubesheet. Therefore, tube pullout would be a prerequisite for tube burst under the limiting internal pressure conditions of NEI 97-06.

WCAP-16208-P Revision 1 evaluated the minimum joint length required to preclude tube pull-out at a load of 3 x NODP, which bounds 1.4 x MSLB differential pressure.

The NEI 97-06 primary to secondary accident-induced leakage criterion of 1 gpm/steam generator exceeds the accident induced leakage limits for most utilities participating in Owners Group development of C\*, including the San Onofre Units 2 and 3 limit of 0.5 gpm/steam generator. To account for this disparity and to allow margin for other possible leak sources, WCAP-16208-P Revision 1, with Supplement 1, evaluated the minimum joint length required to maintain primary to secondary accident induced leakage at 0.2 gpm/steam generator, assuming that 100% of the steam generator tubes were leaking below the C\* depth within both the hot leg tubesheet and the cold leg tubesheet. SCE had additional site-specific work done by Westinghouse (WCAP-16208-P Revision 1, Supplement 1) to define a cold leg C\* depth within the San Onofre Units 2 and 3 cold leg tubesheets.

WCAP-16208-P Revision 1 generated empirical pullout load and leakage rate test data for a number of tube-to-tubesheet joint mock-up samples. The testing determined that the joint length required to satisfy the pull-out criterion was bounded by that required to satisfy the leakage rate criterion. Analytical methods were utilized to correct the empirical data for tubesheet deflection effects on both the joint strength and leakage resistance. Axial position uncertainties associated with eddy current examinations were also accounted for by adding a correction factor to the data. An additional conservatism was introduced by assuming that 100% of the steam generator tubes experienced complete circumferential separation (360 degree through wall crack) immediately below the C\* inspection length. The final result of WCAP-16208-P Revision 1 for San Onofre Units 2 and 3 (Plants CF2 and CF3, respectively) for the hot leg tubesheet was a C\* value of 10.4 inches. The final result of WCAP-16208-P Revision 1, Supplement 1 for San Onofre Units 2 and 3 reaffirmed the hot leg tubesheet C\* value of 10.4 inches, in combination with a newly provided cold leg tubesheet C\* value of 10.7 inches.

The current San Onofre Units 2 and 3 SG tube inspection methods meet the Technical Specification requirements in conjunction with 10CFR 50, Appendix B. The rotating Plus Point Probe employed in the tubesheet region is fully capable of detecting axial and circumferential flaws; however there are significant uncertainties associated with flaw sizing. These uncertainties are addressed by the proposed TS change to the definition of "Repair Limit." Specifically, all tubes exhibiting degradation within the hot leg C\* length of the tubesheet region or within the cold leg tubesheet region, shall be plugged or repaired upon detection as is our current practice in these regions.

## **Conclusion**

The proposed revisions to the San Onofre Units 2 and 3 definitions of steam generator "Repair Limit" and "Tube Inspection" maintain the structural and accident-induced leakage integrity of the steam generator tubes as required by NEI 97-06 and the plant design basis. Furthermore, the proposed revisions do not involve a significant hazard consideration. Therefore, this license amendment is acceptable with respect to the operation of San Onofre Units 2 and 3.

## **5.0 REGULATORY SAFETY ANALYSIS**

### **5.1 No Significant Hazards Consideration**

Southern California Edison (SCE) has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment", as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

This proposed change revises the San Onofre Units 2 and 3 Technical Specifications (TS) by revising the definitions of steam generator "Repair Limit" and "Tube Inspection", as contained in TS items 5.5.2.11.f.1.f and 5.5.2.11.f.1.h, respectively. This proposed change also adds words in the "Operability determination" requirement (item 5.5.2.11.f.2) to provide consistency with the proposed change in the definition of "Repair Limit." These revisions maintain existing design limits and would not increase the probability or consequences of an accident involving tube burst or primary to secondary accident-induced leakage, as previously analyzed in the San Onofre Units 2 and 3 Updated Final Safety Analysis Report (UFSAR). Also, the NEI 97-06 steam generator tube performance criterion for structural integrity and accident-induced leakage will continue to be satisfied.

Tube burst is precluded for a tube with defects within the tubesheet region because of the constraint provided by the tubesheet. As such, tube pullout resulting from the axial forces induced by primary to secondary differential pressures would be a prerequisite for tube burst to occur. An industry test program (WCAP-16208-P Revision 1), and follow-on San Onofre site-specific analysis (WCAP-16208-P Revision 1, Supplement 1) defined the non-degraded hot leg tube to tubesheet joint length and cold leg tube to tubesheet joint length required to preclude tube pullout and maintain acceptable primary to secondary accident-induced leakage, assuming that 100% of the steam generator tubes experienced complete circumferential separation (360 degree through wall crack) immediately below both the hot leg recommended inspection length (C\*) and the cold leg C\*. Any degradation below C\*

is shown by empirical test results and analyses to be acceptable, thereby precluding an event with consequences similar to a postulated tube rupture event.

WCAP-16208-P Revision 1, with Supplement 1 includes a total 0.2 gpm/steam generator assumed value for primary to secondary accident-induced leakage. Inspection to the C\* lengths will ensure that the postulated accident-induced leakage will remain below the current primary to secondary leakage assumption utilized in the UFSAR accident analyses (Chapter 15).

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Steam generator tube leakage and structural integrity will be maintained during all plant conditions upon implementation of the proposed inspection scope and repair limit changes to the San Onofre Unit 2 and 3 Technical Specifications. These changes do not introduce any new mechanisms that might result in a different kind of accident from those previously evaluated. Even with the limiting circumstances of complete circumferential separation (360 degree through wall crack) of all of the tubes below the C\* length, tube pullout is precluded and leakage is predicted to be maintained within accident analysis assumptions.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

Operation with potential tube degradation below the C\* inspection length within the tubesheet region of the steam generator tubing meets the intent of the inspection guidance of Regulatory Guide Number 1.83, Revision 1, titled Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes, the requirements of General Design Criteria 14, 15, 31 and 32 of 10 CFR 50, and the recommendations of the Nuclear Energy Institute in NEI 97-06, titled Steam Generator Program Guidelines.

The total leakage from an undetected flaw population below the C\* inspection length under postulated accident conditions is accounted for to assure that it is within the bounds of the accident analysis assumptions. Adequate margin remains for other possible steam generator tube leak sources.

The proposed changes also maintain the structural and accident-induced leakage integrity of the steam generator tubes as required by NEI 97-06.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, SCE concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

## **5.2 Applicable Regulatory Requirements/Criteria**

Regulatory Guide 1.83, Revision 1, titled Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes, provides guidance on steam generator tubing inspection and repair. The proposed change will continue to meet the intent of this Regulatory Guide.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense or security or to the health and safety of the public.

## **6.0 ENVIRONMENTAL CONSIDERATION**

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component, the steam generators, located within the restricted area, as defined in 10 CFR 20 or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendments meet the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22 (c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with these proposed amendments.

## **7.0 REFERENCES**

- 7.1 Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, Revision 4, titled Steam Generator Tube Integrity, and associated NRC publications regarding usage (NRC Notice for Comment 70 FR 10298 dated March 2, 2005 and NRC Notice of Availability 70 FR 24126 dated May 6, 2005)

- 7.2 Letter from A. E. Scherer Southern California Edison (SCE) to the NRC Document Control Desk Dated October 26, 2004; Subject: Docket Nos. 50-361 and 50-362, NRC Generic Letter 2004-01 Requirements for Steam Generator Tube Inspections, San Onofre Nuclear Generating Station, Units 2 and 3
- 7.3 Westinghouse Owners Group (WOG) topical report WCAP-16208-P, Revision 1, dated May 2005, titled "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions", with Supplement 1, dated July 2005, titled "NDE Inspection Length for San Onofre 2 & 3 Steam Generator Tubesheet Region Cold Leg Explosive Expansions"
- 7.4 Steam Generator Program Guidelines, Revision 1, NEI 97-06, Nuclear Energy Institute, January 2001
- 7.5 Letter from D. E. Nunn (SCE) to the NRC Document Control Desk dated March 17, 2004; Subject: Docket No. 50-361, Special Report: Inservice Inspection of Steam Generator Tubes, Cycle 13, San Onofre Nuclear Generating Station, Unit 2
- 7.6 Letter from A. E. Scherer (SCE) to the NRC Document Control Desk dated September 23, 2004; Subject: Docket No. 50-361, Special Report: Inservice Inspection of Steam Generator Tubes, Cycle 13 Additional Information, San Onofre Nuclear Generating Station, Unit 2
- 7.7 Letter from D. E. Nunn (SCE) to the NRC Document Control Desk dated October 25, 2004; Subject: Docket No. 50-362, Special Report: Inservice Inspection of Steam Generator Tubes, Cycle 13, San Onofre Nuclear Generating Station, Unit 3
- 7.8 Letter from A. E. Scherer (SCE) to the NRC Document Control Desk dated April 21, 2005; Subject: Docket No. 50-362, Report of Inservice Inspection of Steam Generator Tubes, Cycle 13 Additional Information, San Onofre Nuclear Generating Station, Unit 3
- 7.9 San Onofre Nuclear Generating Station Updated Final Safety Analysis Report.



**Attachment A**  
**(Existing Pages)**  
**SONGS Unit 2**

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- e) Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections;
- f) Repair Limit - The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness; Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.
- g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy-current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operating using the equipment and techniques expected to be used during subsequent inservice inspections. These examinations may be performed prior to steam generator installation. Similarly, for tube repair by sleeving, an inspection of the full length of the pressure boundary portion of the sleeved area shall be performed by eddy current techniques prior to service. This includes pressure retaining portions of the parent tube in contact with the sleeve, the sleeve-to-tube weld, and the pressure retaining portion of the sleeve.
- h) Tube Inspection - An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg excluding the portion of the tube within the tubesheet (TS) below 5 inches from the secondary face of the TS.\*
- i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line of feedwater line break accident as specified in Specification 5.5.2.11.e.

\* This exclusion is for Unit 2, Cycle 12 operation only.

(continued)

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- j) Tube Repair - refers to a process that reestablishes tube serviceability. Acceptable tube repairs will be performed by the following process:

TIG welded sleeving as described in ABB/CE Topical Report, CEN-630-P, Rev. 2, is currently approved by the NRC.

Tube repair includes the installation by welding of the sleeves, heat treatment in accordance with CEN-630-P, Rev. 2, to remove the stresses that are introduced by the sleeve installation, acceptance testing of the sleeve, and nondestructive examination for future comparison. Tube repair can be performed on certain tubes that have been previously plugged as a corrective or preventive measure. A tube inspection of the full length of the tube shall be performed on a previously plugged tube prior to returning the tube to service.

- 2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks, and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.

g. Reports

The content and frequency of written reports shall be in accordance with Technical Specification 5.7.2, "Special Reports."

(continued)

**Attachment B**  
**(Existing Pages)**  
**SONGS Unit 3**

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- e) Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections;
- f) Repair Limit - The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness; Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.
- g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy-current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operating using the equipment and techniques expected to be used during subsequent inservice inspections. These examinations may be performed prior to steam generator installation. Similarly, for tube repair by sleeving, an inspection of the full length of the pressure boundary portion of the sleeved area shall be performed by eddy current techniques prior to service. This includes pressure retaining portions of the parent tube in contact with the sleeve, the sleeve-to-tube weld, and the pressure retaining portion of the sleeve.
- h) Tube Inspection - An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg excluding the portion of the tube within the tubesheet (TS) below 5 inches from the secondary face of the TS.\*
- i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line of feedwater line break accident as specified in Specification 5.5.2.11.e.

\* This exclusion is for Unit 3, Cycle 11 operation only.

(continued)

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5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- j) Tube Repair - refers to a process that reestablishes tube serviceability. Acceptable tube repairs will be performed by the following process:

TIG welded sleeving as described in ABB/CE Topical Report, CEN-630-P, Rev. 2, is currently approved by the NRC.

Tube repair includes the installation by welding of the sleeves, heat treatment in accordance with CEN-630-P, Rev. 2, to remove the stresses that are introduced by the sleeve installation, acceptance testing of the sleeve, and nondestructive examination for future comparison. Tube repair can be performed on certain tubes that have been previously plugged as a corrective or preventive measure. A tube inspection of the full length of the tube shall be performed on a previously plugged tube prior to returning the tube to service.

2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks, and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.

g. Reports

The content and frequency of written reports shall be in accordance with Technical Specification 5.7.2, "Special Reports."

(continued)

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**Attachment C**  
**(Proposed Pages)**  
**(Redline and Strikeout)**  
**SONGS Unit 2**

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- e) Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections;
- f) Repair Limit - The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness. Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.

For tubes that have not been repaired (sleeved): Degradation detected below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection.

Degradation detected below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection.

This Repair Limit is not applicable in the portion of the tubing within the hotleg tubesheet as follows:

For tubes that have not been repaired: Greater than 10.4 inches below the bottom of the hot leg expansion transition or top of the hot leg tubesheet, whichever is lower.

For tubes that have been repaired: Below the bottom of the pressure retaining portion of the parent tube in contact with the sleeve (the lower joint that is formed by hard-rolling) or greater than 10.4 inches below the bottom of the hot leg expansion transition, whichever is lower.

(continued)



5.5 Procedures, Programs, and Manuals (continued)

5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy- current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operating using the equipment and techniques expected to be used during subsequent inservice inspections. These examinations may be performed prior to steam generator installation. Similarly, for tube repair by sleeving, an inspection of the full length of the pressure boundary portion of the sleeved area shall be performed by eddy current techniques prior to service. This includes pressure retaining portions of the parent tube in contact with the sleeve, the sleeve-to-tube weld, and the pressure retaining portion of the sleeve.
- h) Tube Inspection - An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg excluding the portion of the tube within the tubesheet (TS) below 5 inches from the secondary face of the TS, \*10.4 inches below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is lower, completely around the U-bend to 10.7 inches below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is lower.
- i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line of feedwater line break accident as specified in Specification 5.5.2.11.e.

~~\* This exclusion is for Unit 2, Cycle 12 operation only.~~

(continued)

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- j) Tube Repair - refers to a process that reestablishes tube serviceability. Acceptable tube repairs will be performed by the following process:

TIG welded sleeving as described in ABB/CE Topical Report, CEN-630-P, Rev. 2, is currently approved by the NRC.

Tube repair includes the installation by welding of the sleeves, heat treatment in accordance with CEN-630-P, Rev. 2, to remove the stresses that are introduced by the sleeve installation, acceptance testing of the sleeve, and nondestructive examination for future comparison. Tube repair can be performed on certain tubes that have been previously plugged as a corrective or preventive measure. A tube inspection of the full length of the tube shall be performed on a previously plugged tube prior to returning the tube to service.

2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks in applicable portions of the tube as described in the definition of "Repair Limit", and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.

g. Reports

The content and frequency of written reports shall be in accordance with Technical Specification 5.7.2, "Special Reports."

(continued)

**Attachment D**  
**(Proposed Pages)**  
**(Redline and Strikeout)**  
**SONGS Unit 3**

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- e) Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections;
- f) Repair Limit - The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness. Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.

For tubes that have not been repaired (sleeved): Degradation detected below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection. Degradation detected below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection.

This Repair Limit is not applicable in the portion of the tubing within the hotleg tubesheet as follows:

For tubes that have not been repaired: Greater than 10.4 inches below the bottom of the hot leg expansion transition or top of the hot leg tubesheet, whichever is lower.

For tubes that have been repaired: Below the bottom of the pressure retaining portion of the parent tube in contact with the sleeve (the lower joint that is formed by hard-rolling) or greater than 10.4 inches below the bottom of the hot leg expansion transition, whichever is lower.

(continued)

5.5 Procedures, Programs, and Manuals (continued)

5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy- current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operating using the equipment and techniques expected to be used during subsequent inservice inspections. These examinations may be performed prior to steam generator installation. Similarly, for tube repair by sleeving, an inspection of the full length of the pressure boundary portion of the sleeved area shall be performed by eddy current techniques prior to service. This includes pressure retaining portions of the parent tube in contact with the sleeve, the sleeve-to-tube weld, and the pressure retaining portion of the sleeve.
- h) Tube Inspection - An inspection of the SG tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg excluding the portion of the tube within the tubesheet (TS) below 5 inches from the secondary face of the TS. \*10.4 inches below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is lower, completely around the U-bend to 10.7 inches below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is lower.
- i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line of feedwater line break accident as specified in Specification 5.5.2.11.e.

~~\* This exclusion is for Unit 3, Cycle 11 operation only.~~

(continued)

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- j) Tube Repair - refers to a process that reestablishes tube serviceability. Acceptable tube repairs will be performed by the following process:

TIG welded sleeving as described in ABB/CE Topical Report, CEN-630-P, Rev. 2, is currently approved by the NRC.

Tube repair includes the installation by welding of the sleeves, heat treatment in accordance with CEN-630-P, Rev. 2, to remove the stresses that are introduced by the sleeve installation, acceptance testing of the sleeve, and nondestructive examination for future comparison. Tube repair can be performed on certain tubes that have been previously plugged as a corrective or preventive measure. A tube inspection of the full length of the tube shall be performed on a previously plugged tube prior to returning the tube to service.

2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks in applicable portions of the tube as described in the definition of "Repair Limit", and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.

g. Reports

The content and frequency of written reports shall be in accordance with Technical Specification 5.7.2, "Special Reports."

(continued)

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**Attachment E**  
**(Proposed Pages)**  
**SONGS Unit 2**

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- e) Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections;
- f) Repair Limit - The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness. Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.

For tubes that have not been repaired (sleeved): Degradation detected below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection. Degradation detected below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection.

This Repair Limit is not applicable in the portion of the tubing within the hotleg tubesheet as follows:

For tubes that have not been repaired: Greater than 10.4 inches below the bottom of the hot leg expansion transition or top of the hot leg tubesheet, whichever is lower.

For tubes that have been repaired: Below the bottom of the pressure retaining portion of the parent tube in contact with the sleeve (the lower joint that is formed by hard-rolling) or greater than 10.4 inches below the bottom of the hot leg expansion transition, whichever is lower.

(continued)



5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy- current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operating using the equipment and techniques expected to be used during subsequent inservice inspections. These examinations may be performed prior to steam generator installation. Similarly, for tube repair by sleeving, an inspection of the full length of the pressure boundary portion of the sleeved area shall be performed by eddy current techniques prior to service. This includes pressure retaining portions of the parent tube in contact with the sleeve, the sleeve-to-tube weld, and the pressure retaining portion of the sleeve.
- h) Tube Inspection - An inspection of the SG tube from 10.4 inches below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is lower, completely around the U-bend to 10.7 inches below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is lower.
- i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break accident as specified in Specification 5.5.2.11.e.

(continued)

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- j) Tube Repair - refers to a process that reestablishes tube serviceability. Acceptable tube repairs will be performed by the following process:

TIG welded sleeving as described in ABB/CE Topical Report, CEN-630-P, Rev. 2, is currently approved by the NRC.

Tube repair includes the installation by welding of the sleeves, heat treatment in accordance with CEN-630-P, Rev. 2, to remove the stresses that are introduced by the sleeve installation, acceptance testing of the sleeve, and nondestructive examination for future comparison. Tube repair can be performed on certain tubes that have been previously plugged as a corrective or preventive measure. A tube inspection of the full length of the tube shall be performed on a previously plugged tube prior to returning the tube to service.

2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks in applicable portions of the tube as described in the definition of "Repair Limit", and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.

g. Reports

The content and frequency of written reports shall be in accordance with Technical Specification 5.7.2, "Special Reports."

(continued)

**Attachment F**  
**(Proposed Pages)**  
**(Redline and Strikeout)**  
**SONGS Unit 3**

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- e) Imperfection - An exception to the dimensions, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections;
- f) Repair Limit - The imperfection depth at or beyond which the tube shall be removed from service or repaired and is equal to 44% of the nominal tube wall thickness. Sleeves shall be removed from service upon detection of service-induced degradation of the sleeve material or any portion of the sleeve-to-tube weld.

For tubes that have not been repaired (sleeved): Degradation detected below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection. Degradation detected below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is higher, shall be removed from service or repaired on detection.

This Repair Limit is not applicable in the portion of the tubing within the hotleg tubesheet as follows:

For tubes that have not been repaired: Greater than 10.4 inches below the bottom of the hot leg expansion transition or top of the hot leg tubesheet, whichever is lower.

For tubes that have been repaired: Below the bottom of the pressure retaining portion of the parent tube in contact with the sleeve (the lower joint that is formed by hard-rolling) or greater than 10.4 inches below the bottom of the hot leg expansion transition, whichever is lower.

(continued)

5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- g) Preservice Inspection - An inspection of the full length of each tube in each SG performed by eddy- current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed prior to initial MODE 1 operating using the equipment and techniques expected to be used during subsequent inservice inspections. These examinations may be performed prior to steam generator installation. Similarly, for tube repair by sleeving, an inspection of the full length of the pressure boundary portion of the sleeved area shall be performed by eddy current techniques prior to service. This includes pressure retaining portions of the parent tube in contact with the sleeve, the sleeve-to-tube weld, and the pressure retaining portion of the sleeve.
- h) Tube Inspection - An inspection of the SG tube from 10.4 inches below the bottom of the hot leg expansion transition or hot leg top of the tubesheet, whichever is lower, completely around the U-bend to 10.7 inches below the bottom of the cold leg expansion transition or cold leg top of the tubesheet, whichever is lower.
- i) Unserviceable - The condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operational Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break accident as specified in Specification 5.5.2.11.e.

(continued)

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5.5 Procedures, Programs, and Manuals (continued)

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5.5.2.11 Steam Generator (SG) Tube Surveillance Program (continued)

- j) Tube Repair - refers to a process that reestablishes tube serviceability. Acceptable tube repairs will be performed by the following process:

TIG welded sleeving as described in ABB/CE Topical Report, CEN-630-P, Rev. 2, is currently approved by the NRC.

Tube repair includes the installation by welding of the sleeves, heat treatment in accordance with CEN-630-P, Rev. 2, to remove the stresses that are introduced by the sleeve installation, acceptance testing of the sleeve, and nondestructive examination for future comparison. Tube repair can be performed on certain tubes that have been previously plugged as a corrective or preventive measure. A tube inspection of the full length of the tube shall be performed on a previously plugged tube prior to returning the tube to service.

- 2. The SG shall be determined OPERABLE after completing the corresponding actions (plug or repair all tubes exceeding the repair limit and all tubes containing through-wall cracks in applicable portions of the tube as described in the definition of "Repair Limit", and plug all sleeved tubes that exceed the repair criteria) required by Tables 5.5.2.11-1 and 5.5.2.11-2.

g. Reports

The content and frequency of written reports shall be in accordance with Technical Specification 5.7.2, "Special Reports."

(continued)

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**ENCLOSURE 4**

**Westinghouse Application for  
Withholding Proprietary Information  
from Public Disclosure with Affidavit**



Westinghouse Electric Company  
Nuclear Services  
P.O. Box 355  
Pittsburgh, Pennsylvania 15230-0355  
USA

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555-0001

Direct tel: (412) 374-4643  
Direct fax: (412) 374-4011  
e-mail: greshaja@westinghouse.com

Our ref: CAW-05-2042

August 16, 2005

**APPLICATION FOR WITHHOLDING PROPRIETARY  
INFORMATION FROM PUBLIC DISCLOSURE**

Subject: WCAP-16208-P, Revision 1, Supplement 1, "NDE Inspection Length for San Onofre Units 2 and 3 Steam Generator Tubesheet Region Explosive Expansions," dated July 2005  
(Proprietary/Non-Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-05-2042 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, 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 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Southern California Edison.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-05-2042, and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

A handwritten signature in black ink, appearing to read 'J. A. Gresham'.

J. A. Gresham, Manager  
Regulatory Compliance and Plant Licensing

Enclosures

cc: B. Benney  
L. Feizollahi



bcc: J. A. Gresham (ECE 4-7A) 1L  
P.R. Nelson (Windsor)  
R. Bastien, 1L (Nivelles, Belgium)  
C. Brinkman, 1L (Westinghouse Electric Co., 12300 Twinbrook Parkway, Suite 330, Rockville, MD 20852)  
RCPL Administrative Aide (ECE 4-7A) 1L, 1A (letter and affidavit only)

AFFIDAVIT

STATE OF CONNECTICUT:

SS

COUNTY OF HARTFORD:

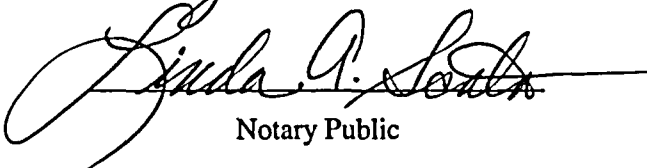
Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:



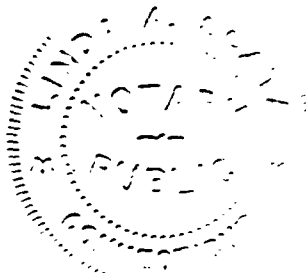
J. A. Gresham, Manager

Regulatory Compliance and Plant Licensing

Sworn to and subscribed  
before me this 16th day  
of August, 2005

  
Notary Public

My Commission Expires: May 31, 2008



- (1) I am Manager, Regulatory Compliance and Plant Licensing, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
  - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
- (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
- (f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
- (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
- (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.
- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

- (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
- (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.
- (iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in "WCAP-16208-P, Revision 1, Supplement 1, 'NDE Inspection Length for San Onofre Units 2 and 3 Steam Generator Tubesheet Region Explosive Expansions,' dated February 2005" (Proprietary), being transmitted by the Southern California Edison Company letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted for use by Westinghouse for San Onofre Units 2 and 3 enables Westinghouse to support utilities with NSSS plants in the identification and application of a steam generator tubesheet inspection model, and in particular, to the application of the model to determining the tubesheet inspection length appropriate to the San Onofre Units 2 and 3 steam generators, including:
  - (a) The identification of important factors relevant to the determination of the recommended steam generator tubesheet inspection length, and
  - (b) Development of a generic methodology for the applicability of the inspection length model to utilities with NSSS plants.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.
- (b) Westinghouse can sell support and defense of the inspection model.
- (c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar inspection models and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

## **PROPRIETARY INFORMATION NOTICE**

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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