Ralph Caruso, LB9

TELEDYNE
ENGINEERING SERVICES

130 SECOND AVENUE

WALTHAM, MASSACHUSETTS 02254

(617) 890-3350 TWX (710) 324-7580

March 15, 1983
5633-53

50-322

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20114

Subject: Independent Design Review for the Shoreham Nuclear Power Station

Dear Mr. Denton:

Please find enclosed the latest classification of items from the subject design review.

TES has received responses from LILCO to items originally classified as Findings and the results of our review of these responses is enclosed. With respect to the classification of Additional Concern, we expect a further response from LILCO to such items prior to a final TES classification.

If you have any questions or comments, please do not hesitate to contact Mr. James P. King or the writer.

Very truly yours,

TELEDYNE ENGINEERING SERVICES

Donald F. Landers

Donald F. Landers
Senior Vice-President

DFL/lh

Enclosures

cc: J. A. Flaherty (TES)
J. P. King (TES)
J. H. Malonson (TES)
TES Document Control

B001

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When Requested Assign Control Number

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Page 1 of 1

Control No. _____

Originator D. F. Landers

Project No. 5633

Date 3/15/83

Client PO 363981

Transmit To: H. R. Denton
USNRC
7920 Norfolk Ave.
Bethesda, MD 20112

Transmitted Under Separate Cover To: M. Milligan (LILCO)

NOTE: Furnish complete identification for items transmitted (below).

QTY	TYPE	ITEM IDENT NO.	REV	DESCRIPTION - Title and Number of Sheets/Pages	REC'D
6		ICR 5633-10			
6		ICR 5633-19			
6		ICR 5633-27			
6		ICR 5633-28			

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TELEDYNE
ENGINEERING SERVICES

INDEPENDENT DESIGN REVIEW

SHOREHAM NUCLEAR POWER STATION

CONTROLLED DOCUMENT

ICR NO.
5633- 10

Reference: RRF No. 5633- 27
PMR No. 5633- 27

Date: 3/15/83

Classification of Item: Additional Concerns

J C Tsoukanas
Reviewer Signature

J. A. Flaherty
Committee Chairman Signature

D. F. Landers
Project Manager Signature

1.0 SUMMARY

During the review of the seismic analysis report for Anchor Darling 10" Globe Valve, IE21 MOV-035, the reviewer noted that:

(1) Cantilever bending mode not computed

(2) Some Class 1 allowables were used in the evaluation for the Class 2 valve

(3) Yoke section properties calculations contained mathematical errors

LILCO/SWEC in their response stated that:

(1) Vendor technical documents are checked and reviewed for compliance with applicable specifications and documents and the results of the review are reported on a SWEC form delineating additions and corrections required for approvals.

(2) The cantilever mode was computed by SWEC for all 27 Category I valves supplied by vendor. The results of this analysis show all frequencies were above the minimum of 33 Hz.

(3) Vendor used Class 2 allowables for yoke and based non-code bolt material (A574) allowable values on Code procedures (1/4 Su).

The SWEC response satisfies the TES concerns regarding the adequacy of the Anchor Darling valves in question. However, concern remains relative to SWEC procedures establishing review methods of vendor calculations and implementation of those procedures.

SWEC has stated that review of vendor technical documents is carried out in accordance with EAP 9.2 and EMTP 8.22 and the results of this review are reported on a SWEC form (Attachment 4.2 of EAP 9.2). TES requests that SWEC submit to TES EMPT 8.22 and the completed review form (Attachment 4.2 of EAP 9.2) for the following calculations:

88AD-1	88AD-5
88AD-2	88AD-6
88AD-3	88AD-7

TES also requests submittals of other relevant procedures or technical guides addressing SWEC review of vendor valve calculations.

The completion of the review and the final classification of this item is contingent upon the receipt of the documents cited above.

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INDEPENDENT DESIGN REVIEW

SHOREHAM NUCLEAR POWER STATION

CONTROLLED DOCUMENT

ICR NO.
5633- 19

Reference: RRF No. 5633- 169
PMR No. 5633- 169

Date: 3/15/83

Classification of Item: Additional Concerns

Gary A. Blanchet
Reviewer Signature

J. G. Flaherty
Committee Chairman Signature

D.F. Landers
Project Manager Signature

1.0 INTRODUCTION

TES issued ICR No. 5633-19 on December 9, 1982 which was a Finding against the SWEC design process with respect to the consideration of fluid transient loads on the Core Spray test piping. A disposition response from LILCO and SWEC was received by TES on February 17, 1983. This response indicated the following:

(1) The SWEC Design Specification, SHI-171, had omitted addressing the test fluid transient loading condition for AX-8K and AX-8AA but an amendment to the specification has been made to correct this via E&DCR No. P4304.

(2) The test mode loading condition has been determined to be insignificant and no computer analysis is warranted or will be performed in the AX packages. However, the SWEC analysis packages will be updated with statements addressing the Core Spray test mode condition.

(3) The Core Spray test loading condition need not be considered as occurring simultaneously with an earthquake or SRV type dynamic load.

(4) SWEC Project Procedure 47 (provided with ICR No. 5633-19 disposition response) requires an in-process review of all input data outlined in Design Specification SHI-171.

2.0 CONCURRENCE WITH DISPOSITION RESPONSE

TES concurs with Disposition Response Items 1 and 4 as the approved SWEC Project Procedure No. 47 allows for the updating of input data in Design Specification SHI-171 via E&DCRs. This procedure has in fact been adhered to by the issuance of E&DCR No. P4304 which incorporates

AX-8K and 8-AA into the design specification as models subject to the Core Spray flow transient test loading condition.

3.0 ADDITIONAL CONCERNS

As a result of reviewing the ICR No. 5633-19 disposition response, TES has established the following additional concerns:

(1) Regarding Disposition Response Item No. 2, TES is concerned that the test mode fluid transient load case considered may not be the most severe. Two other possible test mode fluid transient load conditions have been identified by TES reviewers: (1) a reflected decompression wave case and (2) a steady state thrust load case. The potential for a reflected wave case exists because of the approximate 8 feet of submerged piping at the suppression pool return. Forcing functions in the SWEC NP(B)-120-F1A test mode calculation package indicate load spikes due to the initial exit of the submerged water slug only. No existing analysis reflects the steady state (water solid) operating condition for the Core Spray test line.

(2) Regarding Disposition Response Item No. 3, TES reviewers can identify no SWEC documentation permitting the exclusion of the Core Spray test mode load condition from consideration acting in combination with other dynamic loads. Appendix J of the design specification does not identify the Core Spray test mode condition by category, only as Type "H" occasional loads. Appendix L of the design specification indicates "H" type loads are added algebraically in combination with seismic and SRV dynamic loads as well as pressure and deadweight in an Eq. 9 normal and upset evaluation.

(3) The design specification indicates a pump start-up time of 2-4 seconds for P-013 A&B. The test mode fluid transient analysis has considered 2 seconds and the rapid pump start/stop case has considered a 1 second start-up time. If the design specification time of 2-4 seconds is correct then all cases have used proper or conservative times.

4.0 RECOMMENDATION

It is recommended that SWEC provide justification for the following TES additional concerns:

(1) The omission of consideration for the two potential test mode fluid transient conditions identified in Section 3.0.

(2) Specific SWEC procedural documentation allowing the test mode fluid transient condition to be exempt from acting in combination with other dynamic loads.

(3) Pump start-up time of 2-4 seconds.

TELEDYNE
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INDEPENDENT DESIGN REVIEW

SHOREHAM NUCLEAR POWER STATION

CONTROLLED DOCUMENT

ICR NO.
5633-27

Reference: RRF No. 5633-108, Rev. 2
PMR No. 5633-108, Rev. 2

Date: 3/15/83

Classification of Item: Additional Concerns

Leo E Barron
Reviewer Signature

J. A. Flaherty
Committee Chairman Signature

D.F. Landers
Project Manager Signature

1.0 SUMMARY

During the review of pipe stress calculations of the Core Spray east lead piping, the TES reviewer had a general disagreement with the stress intensification factors (SIF) used in the SWEC analyses. This concern resulted in the issuance of ICR No. 5633-27 as a Finding.

LILCO/SWEC submitted a response to this Finding which indicates the following:

(1) SWEC agrees that 3 SIF factors were improper and these all occur on one pipe stress model (AX-10D)

(2) As a preventive action, a review of all SIF values will be performed by SWEC and completed by March 5, 1983.

(3) Class 1 indices may be used to determine SIF for components not shown in Figure NC-3672.9(a)-1, by using the relationship $i = C_2K_2/2$.

(4) A lower limit of branch size to run size, for which the branch connection has a negligible effect on the run pipe stress, can be determined from the Class 1 indices equations.

2.0 TES ADDITIONAL CONCERNS

In order to completely evaluate the SWEC response, TES will have to review the Preventive Action work performed by SWEC. If this Preventive Action used SIF values for branch connections taken from Class 1 indices, TES will need documentation which indicates that the dimensional requirements (including radii control) specified in NB-3686 are met. Table NB-3683.2-1, Note 3, states that the indices are applicable only for "branch connections" which meet the dimensional requirements of

NB-3686. If compliance with these dimensional requirements cannot be demonstrated then unreinforced fabricated tee SIF must be used.

In determining the lower limit of branch size to run size, for which the branch connection has a negligible effect on the run stress, it should be noted that NB-3683.2-1, Note 7, states the product of C_2K_2 shall be a minimum of 3.0 which would result in a minimum SIF of 1.5. It is TES' opinion that this is the lower limit value which must be used.

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INDEPENDENT DESIGN REVIEW

SHOREHAM NUCLEAR POWER STATION

CONTROLLED DOCUMENT
ICR NO.
5633- 28

Reference: RRF No. 5633- 145, Rev. 1
PMR No. 5633- 145, Rev. 1

Date: 3/15/83

Classification of Item: Additional Concerns

Les E Barron
Reviewer Signature

J. A. Flaherty
Committee Chairman Signature

D.F. Landers
Project Manager Signature

1.0 SUMMARY

While reviewing the operating values (temperature, moduli, and coefficients of expansion) of package AX-10-2, TES reviewer generated RRF 5633-145 (September 27, 1982). PMR 5633-145 (September 29, 1982) requested the reviewer compare all branch line materials and operating values input with those listed on the line designation table. As a result of further review TES generated ICR No. 5633-28 (January 31, 1983).

SWEC's response to ICR No. 5633-28 indicates·

(1) A new revision to AX-10A was generated (AX-10A-3)

(2) NUPIPE run R1649002 (October 30, 1982) contained in the new revision to AX-10A already addressed the concerns of ICR No. 5633-28.

(3) Several items identified by SWEC during an overall review of Class 1 lines were "adjudicated" by SWEC performing a partial reanalysis (NUPIPE run R1649002)

TES received the new revision and applicable NUPIPE runs on February 25, 1983 and due to a substantial number of changes to the package is still reviewing this revision.

2.0 ADDITIONAL CONCERNS

Although the TES review is not completed we have generated some additional concerns as follows:

(1) Tie-back thermal attenuation procedures are still under review.

(2) Justification is required from SWEC as to why water hammer load cases associated with pump operation were not rerun with supports PSR-041 and PSR-065 correctly modeled.

(3) Review of support packages to determine the affects of any support load changes is ongoing.